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The Families and Genera of Marine Gammaridean Amphipoda (Except Marine Gammaroidea)

Part 2

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LYSIANASSIDAE Dana, 1849

**Diagnosis.** Article 3 of gnathopod 2 elongate, remainder of appendage forming mitten apically (Fig.93, all gnathopods); peduncle of antenna 1 short and stout, articles 2-3 much shorter than 1 and partly telescoped basally.

See Iphimediidae, Sebidae and Stegocephalidae.

**Description.** Body compact, chitin usually very smooth and shiny; accessory flagellum usually present and more than 3-articulate but occasionally vestigial; mouthparts enormously variable; lateral shape of epistome and upper lip valuable for identification; most species with smooth broad incisor bounded by cusp on each side, rarely toothed in middle, position of palp on mandible valuable; inner lobes of lower lip absent; tiny details of maxillae valuable, setae of inner plate, number and arrangement of spines on outer plate, ornamentation of palp; shape and setosity of maxilla 2 and ornamentation of maxillipeds variable; rarely maxillipedal palp absent; gnathopod 1 usually small, rarely enlarged, variable; configuration of coxae 1-4 variable; gnathopod 2 always small; pereopods relatively uniform among taxa, rarely prehensile; uropods 1-2 ordinary but inner ramus of uropod 2 occasionally notched; uropod 3 generally ordinary, rarely reduced; telson variable.

**Relationship.** Many taxa outside of Lysianassidae have elongate article 3 of gnathopod 2 but they can be traced through the early part of the keys to families. Sebidae are distinguished by the elongate antenna 1. Though taxonomists are now recognising minute distinctions in gnathopod 2 (loss of pineapple texture and setulation on articles 4-6) the general mitten-form shape is widespread and rarely mistakeable in this family when coupled with the shape of antenna 1.

**Methods.** The keys to genera are divided into sections which proceed outward from the basic key. Ahead of the basic key is a simple key to the subdivisions which is to be used by experienced taxonomists as a
quick reminder as to which section is pertinent to their identification. Following Key O is a section of special groups and keys, representing those taxa firmly definable at subfamilial level.

The Lysianassidae have been and are being divided into groups by various taxonomists but no comprehensive synoptic classification has appeared as yet. To denote those few genera which have already been allocated to subfamilies we add to the diagnosis the operative phrase “Of xxx form:” in which the ‘xxx’ is either ‘conicostomatini’, ‘cyphocarin’, ‘pachynini’, or ‘scopelocheirini’. With each genus the references later than 1980 can be ascertained by the reader to discover the various expositions on subfamily or group cohesiveness.

Removal. Valettiella Griffiths (1977b) is removed to Gammarella in the Gammaroidea.

Master Key to Lysianassidae

Simple Key to Subdivisions of Lysianassidae

1. Specimen aberrant, with either mandibular palp absent, incisor absent, uropod 3 absent or vestigial, or telson absent .............................................................. Key A
2. Mouthparts formed into conical bundle .............................................................. Key B
3. Gnathopod 1 chelate (but also continue to 4 afterwards) ......................................... Key C
4. Middle of incisor dentate (but also continue to 5) ................................................ Key D
5. Palp of maxilla 1 absent .......................................................................... Key E
6. Coxae 1-2 both short together ........................................................................ Key F
7. Mandibular palp attached proximal to molar ........................................ Keys J-K
8. Telson entire .......................................................................................... Key G
9. Gnathopod 1 of scopelocheirin structure .................................................. Key I
10. Inner plate of maxilla 1 with medial setae or with 5+ terminal setae .................. Key M
11. Gnathopod 1 simple ............................................................................ Key N
12. Gnathopod 1 subchelate .......................................................................... Key O
13. Combination of telson entire, gnathopod 1 simple, mandibular palp distally placed .......................................................... Key L

Basic Key to Lysianassidae Subdivisions

1. Article 3 of gnathopod 2 elongate .................................................................. Key 2
   — Article 3 of gnathopod 2 not elongate .................................................. not Lysianassidae
2. Aberrant, either mandibular palp absent, incisor absent, uropod 3 absent or vestigial, or telson absent ............................................................... Key A
   — Mandibular palp, incisor, uropod 3 and telson present ............................... Key 3
3. Mouthparts arranged in conical bundle, styliform ......................................................Key B
   — Mouthparts arranged in quadrate bundle ..............................................................4
4. Gnathopod 1 chelate [but after this procedure return to couplet 5 for further check] ..............................................................Key C
   — Gnathopod 1 subchelate or simple .......................................................................5
5. Middle of incisor sharply dentate or inner plate of maxilla 1 with 4+ setae ..........Key D
   — Middle of incisor smooth, inner plate of maxilla 1 with 0-2 setae .......................6
6. Palp of maxilla 1 absent .........................................................................................Key E
   — Palp of maxilla 1 present ......................................................................................7
7. Both coxae 1-2 (and occasionally 3) reduced and covered by following coxae ..........................Key F
   — Coxae 1-2 together not reduced, often coxa 1 alone reduced .............................8
8. Mandibular palp attached proximal to molar .........................................................Keys J-K
   — Mandibular palp attached opposite or distal to molar ..........................................9
9. Telson entire or emarginate .....................................................................................Key G
   — Telson distinctly cleft though often minutely .......................................................10
10. Gnathopod 1 of scopelocheirin structure (Fig.52J) ...............................................Key I
    — Gnathopod 1 ordinary, simple or subchelate .....................................................11
11. Inner plate of maxilla 1 with medial setae or with 5+ terminal setae ................Key M
    — Inner plate of maxilla 1 with only 3 or fewer terminal setae .............................12
12. Gnathopod 1 simple ..............................................................................................Key N
    — Gnathopod 1 subchelate ...................................................................................13
13. Confirm here telson cleft ......................................................................................14
    — Telson entire return to Key G ............................................................................14
14. Gnathopod 1 chelate return to Key C ......................................................................14
    — Gnathopod 1 subchelate or simple ....................................................................14

Key A (Aberrant Genera)

1. Palp of maxilliped 0-1 articulate ..............................................................................2
   — Palp of maxilliped 2+ articulate .........................................................................4
2. Coxa 2 subequal to coxa 3 in length.................................................................Thoriella
   — Coxae 1-2 much smaller than coxae 3-4 ..........................................................3

3. Body globose, thus pereonites 3-6 greatly inflated, inner
   rami of uropods 1-2 well developed .......................................................(also Key F) Danaella
   — Body not globose, inner rami of uropods 1-2 vestigial ......................(also Key F) Chevreuxiella

4. Coxae 1-2 reduced and covered by coxa 3 ..................................................Key F
   — Coxae 1-2 large and visible together .........................................................5

5. Coxae 1-4 feeble, shorter than broad, article 2 of
   pereopods 5-7 linear, some pereopods prehensile ..................................also Key F
   — Coxae 1-4 robust, longer than broad..........................................................6

6. Mandibular palp present, incisor absent, telson entire,
   article 3 of gnathopod 1 elongate, uropod 3 tiny, rami
   weak or 1 ramus absent......................................................................................Kerguelenia
   — Mandibular palp absent, incisor present, telson deeply cleft, article 3 of gnathopod 1 short, uropod 3 large,
   aequiramous......................................................................................................Stephensenia

Key B
(mouthparts arranged in conical bundle)

1. Coxa 1 or coxae 1-2 reduced together ...............................................................2
   — Neither coxae 1 or 2 reduced .....................................................................3

2. Coxae 1-2 reduced together and covered by coxa 3,
   gnathopod 1 filiform or feeble ..........................................................(also Key F) Lepidepecreella
   — Only coxa 1 reduced and covered by large coxa 2,
   gnathopod 1 giant, propodus huge.................................................................Trischizostoma

3. Gnathopod 1 flagelliform, dactyl elongate and setose ....................................Azotostoma
   — Gnathopod 1 not flagelliform, dactyl not elongate, not
   strongly setose .................................................................................................4

4. Gnathopod 1 chelate .........................................................................................5
   — Gnathopod 1 not chelate ............................................................................Key H

5. Rami of uropod 3 present, palp of maxilla 1 absent ......................................Prachynella
   — Rami of uropod 3 absent, palp of maxilla 1 present ...................................Derjugiana

Key C
(Gnathopod 1 chelate)
(After completion of this key recheck to Basic Key Couplet 5)

1. Inner ramus of uropod 3 less than half as long as outer
   ramus or absent ..............................................................................................2
   — Inner ramus of uropod 3 more than half as long as outer
   ramus ..............................................................................................................7
2. Rami of uropod 3 absent .............................................................. Derjugiana
   — Uropod 3 with 1-2 rami ......................................................... 3

3. Inner and outer plates of maxilliped extending equally, palp very slender ........... Gainella
   — These characters not combined ............................................. 4

4. Uropod 3 with 2 rami ............................................................... 5
   — Uropod 3 with 1 ramus .......................................................... 6

5. Article 1 of accessory flagellum elongate and flat, dactyl of maxilliped ordinary, mandibular palp opposite molar, article 6 larger than 5 on gnathopod 1 .................. Onesimoides
   — Article 1 of accessory flagellum cylindrical, dactyl of maxilliped vestigial mandibular palp proximal to molar, article 6 equal to 5 on gnathopod 1 .................. Nannonyx

6. Gnathopod 1 subchelate, palp of maxilliped ordinary, molar absent, coxa 1 slightly reduced and tapering, article 2 of antenna 1 very short ...................... Pseudonesimoides
   — Gnathopod 1 chelate, palp of maxilliped feeble, molar present, coxa 1 ordinary, article 2 of antenna about 45% as long as article 1 ...................... Paronesimoides

7. Telson cleft .................................................................................. 8
   — Telson entire or emarginate ................................................... 20

8. Palp of mandible set proximal to molar ........................................ Orcromene) Rimakoroga
   — Palp of mandible set opposite or distal to molar ....................... 9

9. Coxa 1 not reduced ....................................................................... 10
   — Coxa 1 reduced and partly covered by coxa 2 ......................... 15

10. Gnathopod 1 not chelate (despite key protocol) ............................. Cheirimédon
    — Gnathopod 1 chelate ................................................................ 11

11. Article 2 of pereopods 5-7 indentured ........................................ Podoprionides
    — Article 2 of pereopods 5-7 weakly serrate ............................. 12

12. Incisor dentate in middle ........................................................... Valettia
    — Incisor smooth in middle ....................................................... 13

13. Coxa 1 tapering below (but not reduced), inner ramus of uropod 2 with slight notch ................................................................. Sophrosyne
    — Coxa 1 not tapering below, inner ramus of uropod 2 lacking notch .......................................................... 14

14. Antenna 1 not cristate, dactyl of palp on maxilliped pointed .................. Kyska
    — Antenna 1 cristate, dactyl on palp of maxilliped stubby ............. Pseudoanonyx
15. Article 2 of pereopod 5 indentured ............................................ Podoprion

— Article 2 of pereopod 5 with small serrations ..................................... 16

16. Carpus on gnathopod 1 of eusirid form ........................................... Opisa

— Carpus on gnathopod 2 ordinary ....................................................... 17

17. Propodus of gnathopod 1 huge ......................................................... Coximedon

— Propodus of gnathopod 1 ordinary ................................................... 18

18. Gnathopod 1 very elongate, chela long and thin ................................ Euonyx

— Gnathopod 1 not elongate, chela short and broad .............................. 19

19. Epistome with anterior knob, labrum not dominant .......................... Aristiopsis

— Epistome lacking knob, labrum dominant ......................................... Schisturella

20. Article 2 of pereopods 5-7 indentured ............................................ Podopriionella

— Article 2 of pereopods 5-7 with small serrations .............................. 21

21. Mandibular palp placed proximal to molar, carpus of gnathopod 1 well developed, palp and inner plate of maxilliped ordinary .................................................... 22

— Mandibular palp placed opposite or distal to molar, carpus of gnathopod 1 evanescent, either inner plate or palp of maxilliped reduced .......................................................... 25

22. Head large, lateral lobe broadly rounded .......................................... Koroga

— Head ordinary, lateral lobe angular ................................................ 23

23. Palp of maxilliped feeble, not exceeding outer plate, dactyl reduced, carpus of gnathopod 1 eusirid ................................................................. Normalion

— Palp of maxilliped ordinary, exceeding outer plate, dactyl ordinary, carpus of gnathopod 1 not eusirid ................................................................. 24

24. Carpus of gnathopod 1 lobate, propodus large, inner ramus of uropod 2 with notch ................................................................. Pseudokoroga

— Carpus of gnathopod 1 not lobate, propodus small, inner ramus of uropod 2 lacking notch ................................................................. Orchomene

25. Propodus of gnathopod 1 subchelate ................................................ Pachychelium

— Propodus of gnathopod 1 chelate .................................................... 26

26. Coxa 1 reduced, articles 1-2 of antenna 1 with large teeth, gnathopod 1 very thin and elongate ................................................................. Izinkala

— Coxa 1 not reduced, antenna 1 lacking teeth, gnathopod 1 ordinary ................................................................. 27

27. Inner plate of maxilliped tiny, palp well-exceeding outer plate, palp of maxilla 1 large ................................................................. Pachynus

— Inner plate of maxilliped medium, palp not reaching apex of outer plate, palp of maxilla 1 absent ................................................................. 28
28. Posterior margin of propodus on gnathopod 1 weakly excavate ............................................................ Prachynella

--- Posterior margin of propodus on gnathopod 1 strongly excavate .......................................................... Figorella

**Key D**  
(Subdivided into D-1 and D-2)

1. Inner plate of maxilla 1 with 4+ setae ................................................................. Key D-1

--- Incisor of mandible toothed in middle ................................................................. Key D-2

--- First two couplets together ................................................................. Keys D-1 and D-2

**Key D-1**

1. Gnathopod 1 of scopelocheirin form, dactyl thus vestigial and shrouded in setae .................................................. Key I

--- Gnathopod 1 ordinary .......................................................................................... 2

2. Head small like Hippomedon, each lobe of cleft telson with 2-9 apical spines, epimeron 3 with very large posteroventral tooth .......................................................................................................................... 3

--- These characters absent or not in combination ........................................................................ 4

3. Mandibular palp article 3 less than half as long as article 2 .................................................. Wecomedon

--- Mandibular palp article 3 subequal to article 2 ........................................................ Paratyphosites

4. Telson entire, inner plate and palp of maxilliped reduced .................................................. Perrierella

--- Telson cleft, maxilliped normal ........................................................................ 5

5. Gnathopod 1 chelate .......................................................................................... 6

--- Gnathopod 1 not chelate .................................................................................. 8

6. Article 2 of pereopod 5 indentured ................................................................. Podoprion

--- Article 2 of pereopod 5 not indentured ...................................................................... 7

7. Coxa 1 not covered by coxa 2, epistome with large sharp tooth, incisor almost smooth ............................................................................................................................. Euonyx

--- Coxa 1 reduced and covered partly by coxa 2, epistome blunt, incisor heavily toothed .................................................. Valettia

8. Head huge, lateral lobe almost evenly semicircular, inner plate of adult maxilla 1 with 1-2 large falcate seta(e) ............................................................................................................................. Hirondellea

--- Head ordinary, setae of maxilla 1 ordinary ........................................................................ 9
9. Article 3 of gnathopod 1 elongate .............................................................. 10
   — Article 3 of gnathopod 1 not elongate .................................................... 12
10. Gnathopod 1 simple .................................................................................. Alicella
    — Gnathopod 1 subchelate ........................................................................ 11
11. Coxa 1 ordinary (incisor mostly smooth) ................................................. Paralicella
    — Coxa 1 shortened (incisor usually deeply toothed in middle) .............. Valettiopsis
12. Coxa 1 not significantly shorter than 2, inner plate of maxilla 2 with row of facial setae ................................................................. Valettietta
    — Coxa 1 significantly shorter and smaller than coxa 1, inner plate of maxilla 2 lacking facial setae .......................................................... 13
13. Article 2 of antenna 2 swollen, inner plate of maxilla 2 parallel to outer plate, medial spines on outer plate of maxilla 1 irregularly distributed ................................................................. Eurythenes
    — Article 2 of antenna 2 ordinary, inner plate of maxilla 2 thrust medially, spines on outer plate of maxilla 1 uniformly distributed .......................................................... Aristas

Key D-2

1. Gnathopod 1 simple .................................................................................. Alicella
   — Gnathopod 1 subchelate ........................................................................ 2
2. Telson entire, inner ramus of uropod 3 reduced ........................................ Onesimoides
   — Telson cleft, inner ramus of uropod 3 not reduced .................................. 3
3. Article 2 of pereopod 5 deeply indentured ................................................ Podoprion
   — Article 2 of pereopod 5 with small serrations ......................................... 4
4. Telson short, cleft less than halfway, inner plate of maxilla 1 with 2 setae .................................................................................. Aristiopsis
   — Telson elongate, cleft three fourths, inner plate of maxilla 1 with 5+ setae .................................................................................. 5
5. Setae on inner plate of maxilla 1 mostly terminal, gnathopod 1 chelate .................................................................................. Valettia
   — Setae on inner plate of maxilla 1 medial, gnathopod 1 subchelate .............. 6
6. Incisor not toothed in middle, molar simple ................................................ Paralicella
   — Incisor toothed in middle, molar triturative ............................................... 7
7. Coxa 1 reduced, urosome with strong acute tooth .................................... Valettiopsis
   — Coxa 1 not reduced, urosome lacking tooth ............................................. Valettietta
Key E  
(Palp of maxilla 1 absent)  
(After finishing this key run specimen through later keys also Basic Key Couplet 7)  

1. Mouthparts conical ........................................................................................................... Key H  
   — Mouthparts not conical ................................................................................................. 2  
2. Telson entire, coxa 1 ordinary .......................................................................................... 3  
   — Telson cleft, coxa 1 reduced .......................................................................................... 5  
3. Gnathopod 1 chelate ......................................................................................................... Prachynella  
   — Gnathopod 1 subchelate or simple ............................................................................... 4  
4. Gnathopod 1 small and simple, palp of maxilliped reduced, uropod 3 lacking rami ................................................................................................................................. Ocosingo  
   — Gnathopod 1 huge, subchelate, palp of maxilliped elongate, uropod 3 biramous ................................................................................................................................. Pachychelium  
5. Coxa 1 with anteroventral cusp ....................................................................................... Vijaya  
   — Coxa lacking anteroventral cusp .................................................................................... 6  
6. Article 2 of antenna 1 as long as article 1 ........................................................................ Bathyamryllis  
   — Article 2 of antenna 1 shorter than article 1 .................................................................... 7  
7. Antenna 1 with tooth, mandibular palp attached opposite well-developed molar, uropod 2 with incision on inner ramus .................................................................................. Amaryllis  
   — Antenna 1 lacking tooth, mandibular palp attached proximal to vestigial molar, uropod 2 lacking incision on inner ramus .................................................................................. Pseudamaryllis  

Key F (Cyphocarins)  
(Divided into 2 starting point keys)  

Key 1 to the Cyphocarin Lysianassidae  

1. Most of uropod 3, telson and most of maxillipedal palp absent ........................................ 2  
   — Most of uropod 3, telson and most of maxillipedal palp present ....................................... 4  
2. Inner rami of uropods 1-2 as long as outer, coxae 3-7 small and discontiguous, inner plates of maxillae 1-2 with thick setae .................................................................................. Thoriiella  
   — Inner rami of uropods 1-2 short or vestigial, coxae 3-7 large and overlapping, inner plates of maxillae 1-2 with thin setae .................................................................................. 3  

3. Pereonites 3-6 ordinary, article 2 of pereopods 6-7 rectangular, maxilliped with tiny palp ........................................... Chevreuxiella
   — Pereonites 3-6 swollen hugely, article 2 of pereopods 6-7 pyriform, maxilliped without palp ................................... Danaella

4. Only coxa 1 reduced and covered partly by coxa 2 .................................................................................. 5
   — Both coxae 1-2 reduced and partly covered by coxae 3-4 ........................................................................... 8

5. Article 2 of antenna 1 elongate ........................................................................ Bathyamaryllis
   — Article 2 of antenna 1 not elongate ............................................................................................................. 6

6. Antenna 1 lacking tooth .................................................................................................................. Pseudamaryllis
   — Antenna 1 bearing tooth ......................................................................................................................... 7

7. Coxa 4 with anteroventral point ......................................................................................................... Vijaya
   — Coxa 4 lacking anteroventral point ........................................................................................................ Amaryllis

8. Base of primary flagellum on antenna 1 with callynophore .................................................................. 9
   — Base of primary flagellum on antenna 1 without callynophore ............................................................... 13

9. Coxa 3 short like coxae 1-2 and mostly covered by coxa 4 .................................................................. 10
   — Coxa 3 large ............................................................................................................................................ 11

10. Article 2 of pereopod 5 expanded and toothed ................................................................................. Cyphocaris
    — Article 2 of pereopod 5 linear and smooth ............................................................................................. Pseudocyphocaris

11. Mandibular palp absent .................................................................................................................... Mesocyclocaris
    — Mandibular palp present .......................................................................................................................... 12

12. Coxae 1-2 small ..................................................................................................................................... Cyclocaris
    — Only coxa 1 small ..................................................................................................................................... Metacyclocaris

13. Telson cleft .......................................................................................................................................... 14
    — Telson entire .......................................................................................................................................... 18

14. Telson deeply cleft (five eights+) ........................................................................................................ 15
    — Telson weakly cleft (one third-) .......................................................................................................... 16

15. Head ordinary, molar present, pereopods simple .............................................................................. Procyphocaris
    — Head grotesque, molar absent, pereopods 3-6 prehensile ................................................................. Paracyphocaris

16. Article 2 of pereopods 5-7 well expanded, coxae 3-6 large ................................................................. 17
    — Article 2 of pereopods 5-7 unexpanded, coxae 1-7 all tiny .......................................................... Cyphocarioides
17. Mandibular palp and rakers absent, telson elongate.......................... *Metacyphocaris*
   — Mandibular palp and rakers present, telson short.......................... *Mesocyphocaris*

18. Rami of uropod 3 subequally extended, article 2 of pereopod 5 thin and distinct from pereopods 6-7.......................... 19
   — Uropod 3 parviramous, inner ramus short or absent, article 2 of pereopod 5 thin and distinct from pereopods 6-7, mandibular palp 3-articulate.......................... *Lepidepecreella*
   — Uropod 3 parviramous, inner ramus thus short, article 2 of pereopod 5 like that of pereopods 6-7, mandibular palp 3-articulate......................................................... 20

19. Mandibular palp absent, uropod 3 ordinary........................................... *Crybelocephalus*
   — Mandibular palp present, inner ramus of uropod 3 shortened, outer ramus 1-articulate but notched.......................... *Pseudocyphocaris*

20. Urosomites 2-3 separate, article 2 of pereopods 5-7 rectangular.......................... *Cebocaris*
   — Urosomites 2-3 fused together, article 2 of pereopods 5-7 ovate.......................................................... *Crybelocypocaris*

**Key 2 to the Cyphocarin Lysianassidae**

1. Only coxa 1 reduced and partly covered by coxa 2 ......................... see Key 1, Couplet 4
   — Both coxae 1-2 reduced and partly covered by coxa 3.......................... 2

2. Urosomites 2 and 3 coalesced.......................................................... 3
   — Urosomites 2 and 3 separate.......................................................... 4

3. Coxae 5-6 ordinary, mandibular palp present, palp of maxilliped ordinary, pereopods 3-5 prehensile.......................... *Crybelocypocaris*
   — Coxae 5-6 enlarged, mandibular palp absent, palp of maxilliped vestigial, pereopods 3-5 not prehensile.......................... *Chevreuxiella, Danaella* see Key 1 couplet 3

4. Mandible lacking palp.......................................................... 5
   — Mandible bearing palp.......................................................... 7

5. Pereopods 4-5 prehensile, article 6 of gnathopod 1 shorter than article 5.................................................. *Mesocyphocaris*
   — Pereopods 4-5 not prehensile, articles 5 and 6 of gnathopod 1 subequal.................................................. 6

6. Telson entire.......................................................... *Crybelocephalus*
   — Telson cleft.......................................................... *Metacyphocaris*

7. Uropod 3 inner ramus strongly reduced or absent.......................... 8
   — Uropod 3 rami subequal to each other, well developed.......................... 11
8. Pereopods simple .............................................. *Lepidepecreella*
   — Pereopods prehensile ..................................................... 9

9. Telson entire .......................................................... *Cebocaris*
   — Telson cleft ........................................................................ 10

10. Telson short, mandibular palp article 3 long, 3-articulate, 
    coxae 3-4 relatively large, article 2 of pereopods 5-7 
    expanded ........................................................................... *Mesocyphocaris*
   — Telson elongate, mandibular palp article 3 short, 2-
    articulate, coxae 3-4 tiny, article 2 of pereopods 5-7 thin........ *Cyphocarioides*

11. Coxa 2 much larger than 1 and covering it but coxae 3-4 
    small, not covering anterior coxae ........................................ *Metacyclocuris*
   — Some of coxae 1-2 or 1-3 covered either by 3 or 4, coxa 
    4 large ................................................................................ 12

12. Article 2 of pereopod 3 deeply indentured or with very 
    long, simple posterodistal tooth; coxae 1-3 all small and 
    covered by coxa 4 .................................................................. *Cyphocaris*
   — Article 2 of pereopod 3 not deeply indentured, only 
    coxae 1-2 reduced and covered by coxae 3 or 4 .................... 13

13. Some pereopods prehensile ............................................. *Paracyphocaris*
   — Pereopods simple ............................................................. 14

14. Mandible bearing triturative molar .................................... *Procyphocaris*
   — Mandible lacking distinct molar or with conicolaminate and 
    unridged molar ................................................................. *Cyclocaris*

**Key G**

(Telson entire)

1. Maxilliped abnormal, either palp not exceeding outer plate 
   or dactyl reduced to absent, or inner plate reduced to 
   absent .................................................................................... 2
   — Maxilliped normal, plates ordinary, palp well-exceeding 
     outer plate, dactyl well developed, unguiform...................... 10

2. Maxilla 2 medially setose and inner plate of maxilla 1 with 
   4+ setae, inner plate of maxilliped evanescent combined 
   with palp 3-articulate and not exceeding outer plate............... *Perrierella*
   — Maxilla 2 not medially setose, inner plate of maxilla 1 with 
     fewer than 3 setae, characters of maxilliped not in such 
     combination ........................................................................ 3

3. Inner plate of maxilliped well developed but palp not 
   exceeding outer plate .......................................................... 4
   — Inner plate of maxilliped evanescent, palp well-exceeding 
     outer plate ......................................................................... 8
4. Article 2 of pereopods 5-7 indentured ...  
   — Article 2 of pereopods 5-7 with small serrations ...
   Podoprionella

5. Carpus of gnathopod 1 eusirid and with thin lobe ...  
   — Carpus of gnathopod 1 not eusirid, lacking thin lobe ...
   Normanion

6. Palp of maxilla 1 absent, rami of uropod 3 well developed ...  
   — Palp of maxilla 1 present, rami of uropod 3 = 0-1
   Prachynella, Figorella (Key C)

7. Rami of uropod 3 = 2, plates of maxilla 2 thin ...  
   — Rami of uropod 3 = 0, plates of maxilla 2 thin ...
   Nannonyx
   — Rami of uropod 3 = 1, plates of maxilla 2 broad..
   Derjugiana (also see couplet 13) Pseudonesimoides

8. Articles 1-2 of antenna 1 with large teeth, coxa 1 reduced, gnathopod 1 very thin, outer plate of maxilliped evanescent ...
   — Articles 1-2 of antenna 1 without teeth, coxa 1 not reduced, gnathopod 1 ordinary, outer plate of maxilliped well developed ...
   Izinkala

9. Gnathopod 1 chelate, palp of maxilla 1 large ...  
   — Gnathopod 1 large but subchelate, palp of maxilla 1 absent...
   Pachynus
   — Pachychelium

10. Inner ramus of uropod 3 tiny or absent ...  
    — Inner ramus of uropod 3 half as long as outer or longer ...
    Onesimoides
    — Clepidecrella

11. Gnathopod 1 subchelate, article 2 of pereopod 5 linear ...
    — Gnathopod 1 subchelate, article 2 of pereopod 5 expanded ...
    Paronesimoides

12. Inner ramus of uropod 3 tiny ...  
    — Inner ramus of uropod 3 absent ...
    Onesimoides

13. Gnathopod 1 subchelate, palp of maxilliped ordinary ...  
    — Gnathopod 1 chelate, palp of maxilliped feeble ...
    Paronesimoides
    — Pseudonesimoides

14. Coxa 1 reduced ... (also return to Basic Key Couplet 10) Ventiella
    — Coxa 1 ordinary ...
    Ventiella

15. Pereopod 3 hugely prehensile ...  
    — Pereopod 3 not prehensile ...
    Endevoura

16. Carpus of pereopod 3 eusirid ...  
    — Carpus of pereopod 3 not eusirid ...
    Ensayara
17. Gnathopod 1 simple ..............................................................Key V  
   — Gnathopod 1 subchelate......................................................18

18. Head with large rounded ocular lobes ..................................Koroga  
   — Head ordinary ...................................................................19

19. Inner ramus of uropod 2 simple ..........................................20  
   — Inner ramus of uropod 2 with notch ..................................21

20. Mandibular palp set proximal to molar ..............................Orchomene  
   — Mandibular palp set opposite molar .................................Adeliella

21. Article 4 of male and female antenna 2 expanded ..............Lysianella  
   — Article 4 of female antenna 2 not expanded ......................22

22. Propodus of gnathopod 1 expanded, carpus very short and lobate, thus broader than long, plates of maxilla 2 thin ..............................Pseudokoroga  
   — Propodus of gnathopod 1 ordinary, carpus ordinary, plates of maxilla 2 ordinary ............................................................23

23. Molar evanescent or absent ................................................Pseudambasia  
   — Molar large and triturative ..................................................24

24. Gnathopod 1 more slender, telson usually with notch, antenna 2 not powerful ......................................................Boeckosimus (= Onisimus)  
   — Gnathopod 1 stouter, telson only emarginate or entire, antenna 2 powerful ......................................................Onisimus (= Pseudalibrotus)

Key H (Conicostomatinae Genera)

1. Uropod 3 biramous ..............................................................2  
   — Uropod 3 without rami or rami vestigial ..............................6

2. Antenna 1, accessory flagellum nearly as long as primary flagellum; mandibular palp attached just proximal to molar ..........................................................3  
   — Antenna 1, accessory flagellum half or less than half length of primary flagellum; mandibular palp attached extremely proximally ..........................................................5

3. Epistome strongly produced; mandible with small accessory spines .................................................................................Socarnoides  
   — Epistome not strongly produced; mandible without accessory spines .............................................................4

4. Maxilla 1, palp well developed, 2-articulate ..............................Shackletonia  
   — Maxilla 1, palp small, 1-articulate ........................................Acidostoma
5. Urosome not compressed; uropods 1 to 3, rami subequal in length; maxillipedal palp 4-articulate...........................................(? and Douniaella) Phoxostoma

--- Urosome compressed; uropods 1 to 3, inner ramus reduced; maxillipedal palp 3-articulate ........................................Conicostoma

6. Maxilliped, inner plate elongate, styliform or substyliform .........................................................7

--- Maxilliped, inner plate short, subquadrate ....................................................................................8

7. Head completely concealed by pereonite 1 and coxa 1, inner ramus of uropods 1 and 2 reduced or absent; telson flat ..................................................................................................................Ocosingo

--- Most of head visible; rami of uropods 1 and 2 subequal in length; telson hemiacetabulate ..........Stomacontion

8. Head concealed by pereonite 1 and coxa 1; outer plate of maxilliped with smooth cutting edge ..........................................................Acontiosostoma

--- Most of head visible; outer plate of maxilliped with serrate distomedial cutting edge ..................Scolopostoma

Key I
(Gnathopod 1 of Scopelocheirin structure)

1. Inner plate of maxilla 1 with 2 setae ..........................................................................................2

--- Inner plate of maxilla 1 with 5+ setae .........................................................................................4

2. Antenna 1 with tooth (teeth) ..........................................................................................................Ichnopus

--- Antenna 1 lacking tooth ................................................................................................................3

3. Only pereopod 5 indentured ............................................................................................................Glycerina

--- Pereopods 5-7 indentured ............................................................................................................Lucayarina

4. Mandible lacking molar, pereopods 3-4 especially prehensile ..................................................Scopelocheiropsis

--- Mandible with molar, pereopods 3-4 not prehensile .....................................................................5

5. Gnathopod 2 minutely chelate ........................................................................................................6

--- Gnathopod 2 subchelate ..............................................................................................................7

6. Coxae 1-4 densely setose, outer plate of maxilla 2 broadest ............................................................Arour

--- Coxae 1-4 barely setose, inner plate of maxilla 2 broadest .............................................................Scopelocheirus

7. Article 2 of gnathopod 1 swollen, coxa 1 slightly reduced .............................................................Eucallisoma

--- Article 2 of gnathopod 1 ordinary, coxa 1 not reduced .................................................................8
8. Inner plate of maxilla 1 lacking basal setae, dactyl of gnathopod 1 not easily visible .......................................................... *Paracallisomopsis*

   — Inner plate of maxilla 1 with basal setae, dactyl of gnathopod 1 easily visible .......................................................... *Paracallisoma*

**Key J**

(Mandibular palp set proximal to molar)

1. If gnathopod 1 chelate return to Key C, if telson entire return to Key G ........................................................................ Keys C and G

   — Otherwise continue to .................................................................................................................................................. Keys C and G

2. Gnathopod 1 simple .......................................................... *(Lysianassins) Key K*

   — Gnathopod 1 subchelate ................................................................................................................................. 3

3. Coxa 1 slightly reduced and tapering .................................................. *Gronella*

   — Coxa 1 ordinary ................................................................................................................................................. 4

4. Gnathopod 1 significantly enlarged ...................................................................................................................... 5

   — Gnathopod 1 ordinary ............................................................................................................................................ 8

5. Inner ramus of uropod 2 incised .......................................................... *Pseudokoroga*

   — Inner ramus of uropod 2 simple .......................................................................................................................... 6

6. Carpus of gnathopod 1 eusirid and with thin lobe ........................................ *Normanion*

   — Carpus of gnathopod 1 ordinary, lobe if present not embraced by gaps on sides .......................................................................................................................... 7

7. Head with broadly subcircular lateral lobes, telson emarginate, labrum dominant, epimeron 3 unserrate .................................................. *Korogra*

   — Head ordinary, telson cleft, epistome dominant, epimeron 3 serrate .................................................................................................................................................. *(terminal male) Rimakoroga*

8. Inner ramus of uropod 2 with notch(es) .......................................................... 9

   — Inner ramus of uropod 2 simple ............................................................................................................................................. 10

9. Labrum dominant, outer ramus of uropod 3 with 2 articles, article 4 of male antenna 2 greatly inflated but article 5 slender .................................................. *Lysianella*

   — Epistome dominant, outer ramus of uropod 3 with 1 article, article 4 of male antenna 2 not greatly inflated nor different from article 5 ............................................................................... *Pseudambasia*

10. Article 6 of gnathopod 1 greatly elongate and slender, uropod 2 superspinose .................................................................................. *Pseudorchomene*

   — Article 6 of gnathopod 1 ordinary, uropod 2 ordinary .......................................................................................... 11
11. Antenna 1 and body grossly cristate or carinate .................................................. \textit{Lepidepecreum}  
--- Antenna 1 and body not cristate ........................................................................... 12

12. Mandibular palp almost opposite molar .............................................. (see \textit{Douniaella} below) \textit{Paralibrotus}  
--- Mandibular palp strongly proximal to molar .......................................................... 13

13. Flagellum of young male antenna 2 conical, base conjoint, terminal male with article 5 of peduncle inflated ...................................................... \textit{Microlysias}  
--- Flagellum and peduncle of male antenna 2 ordinary .............................................. 14

14. Upper lip and epistome separate .............................................................. \textit{Rimakoroa}, \textit{Orchomene}  
--- Upper lip and epistome fused together .................................................................. 15

15. Gnathopod 1 poorly subchelate, outer plate of maxilliped ordinary ...................................................... \textit{Falklandia}  
--- Gnathopod 1 well subchelate, outer plate of maxilliped almost naked ................ \textit{Douniaella}  

\textbf{Key K}  
(Lysianassins, gnathopod 1 simple, mandibular palp proximal)

1. Telson cleft .............................................................................................................. 2  
--- Telson entire or emarginate .................................................................................. 8

2. Inner ramus of uropod 2 with notch ........................................................................ 3  
--- Inner ramus of uropod 2 simple .............................................................................. 4

3. Outer plate of maxilliped rounded apically .......................................................... \textit{Concarines}  
--- Outer plate of maxilliped pointed apically .......................................................... \textit{Socarnoides}

4. Antenna 1 with tooth ......................................................................................... \textit{Socarnella}  
--- Antenna 1 lacking tooth ......................................................................................... 5

5. Peduncle of uropod 3 expanded ........................................................................... \textit{Septcarnes}  
--- Peduncle of uropod 3 not expanded ..................................................................... 6

6. Gills not pleated ................................................................................................. \textit{Waldeckia}  
--- Gills pleated ........................................................................................................... 7

7. Pereopod 6 equals 7, pereopod 5 shorter ............................................................... \textit{Socarnopsis}  
--- Pereopod 6 smaller than 7 .................................................................................. \textit{Socarnes}

8. Antenna 1 with tooth ............................................................................................. 9  
--- Antenna 1 lacking tooth ......................................................................................... 14
9. Uropods 1 or 2 setose .................................................................................................................. 10
   — Uropods 1-2 not setose ........................................................................................................ 12
10. Epistome produced, outer plate of maxilla 2 broadest ............................................................... Bonassia
   — Epistome not produced, inner plate of maxilla 2 broadest .............................................................. 11
11. Outer plate of maxilla 2 geniculate .................................................................................................. Phoxostoma
   — Outer plate of maxilla 2 ordinary .............................................................................................. Dartenella
12. Outer ramus of uropod 3 2-articulate .......................................................................................... Lysianassa
   — Outer ramus of uropod 3 1-articulate .......................................................................................... 13
13. Telson notched ................................................................................................................................. Socarnella
   — Telson entire ............................................................................................................................... Lysianassa
14. Epistome and upper lip mostly fused, poorly separated, lacking deep notch, or upper lip not distinctly produced ...................................................................................................................... 15
   — Epistome and upper lip separated by deep notch, at least upper lip strongly produced, occasionally epistome also produced alongside upper lip .................................................................. 19
15. Urosomites 2-3 coalesced .............................................................................................................. Pseudambasia
   — Urosomites 2-3 separate .............................................................................................................. 16
16. Outer ramus of uropod 3 1-articulate .......................................................................................... Parambasia and Pronannonyx
   — Outer ramus of uropod 3 2-articulate .......................................................................................... 17
17. Article 2 of pereopod 6 with large anterior and posterior lobes ...................................................... Rhinolabia
   — Article 2 of pereopod 6 ordinary .................................................................................................. 18
18. Inner ramus of uropod 3 two thirds of outer ramus, article 2 of outer ramus elongate .................... Kakanui
   — Inner ramus of uropod 3 one third of outer ramus, article 2 of outer ramus short ...................... Parawaldeckia
19. Epistome produced alongside upper lip ......................................................................................... 20
   — Epistome not produced .................................................................................................................. 21
20. Outer ramus of uropod 3 2-articulate .......................................................................................... Dissiminussa
   — Outer ramus of uropod 3 1-articulate .......................................................................................... Macronassa
21. Peduncle of uropod 3 long and not expanded ................................................................................. 22
   — Peduncle of uropod 3 short and expanded .................................................................................. 23
22. Gills not pleated ............................................................................................................................... possibly some species of Lysianassa
   — Gills pleated ............................................................................................................................... Lysianassa
23. Gnathopod 1 enlarged and falcate.................................*Falcanassa*
   — Gnathopod 1 ordinary and simple ..............................................24
24. Outer ramus of uropod 3 2-articulate...........................................25
   — Outer ramus of uropod 3 1-articulate............................................26
25. Male antenna 2 elongate.........................................................*Aruga*
   — Male antenna 2 short, like female...............................................*Lysianopsis*
26. Outer plate of maxilla 1 with 1 set of spines...............................*Shoemakerella*
   — Outer plate of maxilla 1 with 2 sets of spines.............................*Arugella*

Special Key L
(Telson entire, gnathopod 1 simple, mandibular palp distal)

1. Pereopod 3 subchelate ........................................................................2
   — Pereopod 3 simple ........................................................................3
2. Dactyl of maxilliped unguiform, inner plate of maxilla 2 reduced ........*Ensayara*
   — Dactyl of maxilliped bulbous, inner plate of maxilla 2 ordinary .........*Endevoura*
3. Inner ramus of uropod 3 reduced .....................................................*Clepidecrella*
   — Inner ramus of uropod 3 ordinary ...................................................4
4. Prebuccal mass sharply produced anteriorly ......................................*Paralysianopsis*
   — Prebuccal mass blunt anteriorly ......................................................5
5. Article 3 of gnathopod 1 slightly elongate .......................................*Parambasia*
   — Article 3 of gnathopod 1 not elongate .............................................6
6. Inner ramus of uropod 2 incised......................................................female *Pseudambasia*
   — Inner ramus of uropod 2 simple ....................................................7
7. Carpus of gnathopod 1 lobate .........................................................*Paralibrotus*
   — Carpus of gnathopod 1 not lobate ..................................................*Menigrates*

Key M
(Inner plate of maxilla 1 multisetose)

1. Pereopod 5 indentured ......................................................................*Podoprion*
   — Pereopod 5 with small serrations on article 2 ....................................2
2. Incisor dentate in middle ................................................................. 3
   — Incisor smooth in middle ............................................................ 5

3. Gnathopod 1 chelate, inner ramus of uropod 2 weakly incised, outer plate of maxilliped with sharp cusp apically ........................................ Valettia
   — Gnathopod 1 not chelate, inner ramus of uropod 2 simple, outer plate of maxilliped rounded apically .............................................. 4

4. Coxa 1 reduced, urosome with strong acute tooth ........................................ Valettiopsis
   — Coxa 1 ordinary, urosome without acute tooth ................................ Valettietta

5. Telson with broad apices bearing 7-9 spines, uropod 2 setose .............................................................. Paratryphosites
   — Telson with narrow apices bearing 0-3 spines, uropod 2 not setose ................................................................................ 6

6. Prebuccal mass sharp anteriorly .................................................. Parschisturella
   — Prebuccal mass blunt anteriorly ................................................... 7

7. Article 3 of gnathopod 1 not elongate, coxa 1 slightly reduced ................................................................................ 8
   — Article 3 of gnathopod 1 elongate, coxa 1 ordinary ......................... 9

8. Epistome dominant, telson elongate .............................................. Eurythenes
   — Upper lip dominant, telson short .................................................. Aristius

9. Gnathopod 1 simple .................................................................. Alicella
   — Gnathopod 1 subchelate .......................................................... Paralicella

Key N
(Gnathopod 1 simple, mandibular palp opposite molar, telson cleft)

1. Coxa 1 reduced and tapering ......................................................... 2
   — Coxa 1 ordinary ........................................................................ 7

2. Dactyl of maxilliped vestigial .......................................................... 3
   — Dactyl of maxilliped ordinary ......................................................... 5

3. Epistome not dominant, molar simple but large ............................. Centromedon
   — Epistome dominant, molar evanescent ......................................... 4

4. Palp of maxilliped narrow ............................................................ Ambasitia
   — Palp of maxilliped as broad as outer plate ......................................... Ambasiella

5. Inner ramus of uropod 2 not strongly incised ................................. Ambasiopsis
   — Inner ramus of uropod 2 strongly incised ......................................... 6
6. Outer plate of maxilliped with 2+ apical spines, gnathopod 1 subchelate though often poorly ........................................................... *Schisturella*
   — Outer plate of maxilliped lacking significant apical spines, gnathopod 1 simple ........................................................... *Metambusia*

7. Dactyl of gnathopod 1 shrouded in setae, of scopelocheirin form ........................................................... Key I
   — Gnathopod 1 ordinary ........................................................... 8

8. Article 2 of pereopods 6-7 indented ........................................................... *Lucayarina*
   — Article 2 of pereopods 6-7 with small serrations ........................................................... 9

9. Prebuccal mass sharp anteriorly ........................................................... *Parschisturella*
   — Prebuccal mass blunt anteriorly ........................................................... 10

10. Inner ramus of uropod 2 incised ........................................................... *Ichnopus, Cicadosa*
    — Inner ramus of uropod 2 simple ........................................................... 11

11. Maxillae 1-2 medially setose ........................................................... *Alicella*
    — Maxillae 1-2 not medially setose ........................................................... 12

12. Telson short, cleft less than 40% ........................................................... *Menigrates*
    — Telson long, cleft 50+% ........................................................... 13

13. Molar triturative, dactyl of gnathopod 1 large ........................................................... *Paracentromedon*
    — Molar simple, dactyl of gnathopod 1 small ........................................................... *Ichnopus, Menigratopsis*

**Key O**

*To confirm telson cleft, mandibular palp near molar, gnathopod 1 subchelate, not scopelocheirin, maxillae not medially setose, maxillipeds normal*

1. Articles 5-6 of gnathopod 1 together very elongate ........................................................... *Pseudorchomene*
   — Articles 5-6 of gnathopod 1 not greatly elongate ........................................................... 2

2. Coxa 1 reduced or tapering strongly ........................................................... 3
   — Coxa 1 ordinary ........................................................... 15

3. Inner plate of maxilla 1 with 5+ setae ........................................................... *Eurythenes*
   — Inner plate of maxilla 1 with 0-3 setae ........................................................... 4

4. Head very broadly rounded anteriorly, inner plate of adult maxilla 1 with 1-2 huge falcate setae ........................................................... *Hirondellea*
   — Head ordinary, setae on inner plate of maxilla 1 ordinary ........................................................... 5
5. Epistome dominant .............................................................................................................................. 6
   — Epistome not dominant ................................................................................................................... 8

6. Telson cleft less than halfway, prebuccal mass very long anteriorly ............................................... Aristiopsis
   — Telson cleft more than halfway, prebuccal mass of ordinary length dorsoventrally .................. 7

7. Inner ramus of uropod 2 incised ........................................................................................................ 8
   — Inner ramus of uropod 2 simple .................................................................................................. Uristes, Tryphosella

8. Prebuccal mass elongate dorsoventrally ...................................................................................... Aristiopsis
   — Prebuccal mass ordinary .............................................................................................................. 9

9. Dactyl of maxilliped small .............................................................................................................. Centromedon
   — Dactyl of maxilliped ordinary ................................................................................................ 10

10. Inner ramus of uropod 2 incised .................................................................................................... Schisturella
    — Inner ramus of uropod 2 simple ................................................................................................. 11

11. Telson cleft one eighth .................................................................................................................. Ventiella
    — Telson cleft one half or more ................................................................................................... 12

12. Gnathopod 1 greatly enlarged ........................................................................................................ Coximeden
    — Gnathopod 1 ordinary .................................................................................................................. 13

13. Inner plate of maxilla 2 with dominant medial seta most ventrad, outer plate of maxilliped with 2 apical spines .............................................................................................................. Cedrosella
    — Inner plate of maxilla 2 with ventrad seta not dominant, outer plate of maxilliped lacking apical spines .................................................................................................................. 14

14. Article 3 of gnathopod 1 not elongate ............................................................................................ Ambasiopsis
    — Article 3 of gnathopod 1 elongate ............................................................................................... Tmetonyx

15. Prebuccal mass sharp anteriorly ...................................................................................................... 16
    — Prebuccal mass blunt anteriorly .................................................................................................. 17

16. Only epistome pointed ..................................................................................................................... Tryphosites
    — Only upper lip pointed ................................................................................................................. Parschisturella

17. Article 3 of gnathopod 1 elongate ................................................................................................... 18
    — Article 3 of gnathopod 1 not elongate ......................................................................................... 19

18. Inner ramus of uropod 2 simple ...................................................................................................... Tmetonyx
    — Inner ramus of uropod 2 incised ................................................................................................. Cicadosa

19. Dactyl of maxilliped reduced ......................................................................................................... Doniaella, Rifcus, Martensia
    — Dactyl of maxilliped ordinary ................................................................................................... 20
20. Urosomite 1 with deep dorsal notch .............................................. *Cheirimedon* and *Tryphsoides*
   — Urosomite 1 with weak notch or only tooth ................................................. 21
21. Pereopod 5 with spur(s) ............................................................................... *Lepidepcreoides*
   — Pereopod 5 lacking spurs .............................................................................. 22
22. Head large ........................................................................................................... 23
   — Head small ........................................................................................................ 27
23. Inner ramus of uropod 2 simple ....................................................................... 24
   — Inner ramus of uropod 2 incised ...................................................................... 25
24. Gnathopod 1 simple, head eyeless .................................................................. *Menigratopsis*
   — Gnathopod 1 subchelate, head oculate ......................................................... *Anonyx*
   — Gnathopod 1 subchelate, head anoculate .................................................... *Caeconyx, Martensia*
25. Outer plate of maxilliped with large medial and apical spines ...................... *Bruunosa*
   — Outer plate of maxilliped with small or no medial spines ................................ 26
26. Gnathopod 1 subchelate, molar simple ........................................................... *Anonyx*
   — Gnathopod 1 barely subchelate, molar triturative ......................................... *Paronesimus*
27. Mandibular palp article 3 short ........................................................................ 28
   — Mandibular palp article 3 elongate ................................................................... 29
28. Telson cleft halfway ......................................................................................... *Doniaella, Elimedon*
   — Telson cleft three fourths ............................................................................... *Paracentromedon, Martensia*
29. Molar conicolaminate ....................................................................................... *Uristes, Martensia*
   — Molar triturative ............................................................................................... 30
30. Telson short, cleft less than halfway, each lobe with 7-9 apical spines ........ *Paratryphosites*
   — Telson long, cleft less than halfway, each lobe with 1-2 spines ..................... *Doniaella, Cheirimedon*
   — Telson long, cleft more than halfway, each lobe with 1-5 apical spines .......... 31
31. Flagellum of antenna 1 with callynophore ..................................................... *Hippomedon*
   — Flagellum of antenna 1 without callynophore ............................................... 32
32. Articles 2-3 of antenna 1 each longer than article 1 of flagellum, pereopod 5 shorter (25%) than pereopods 6-7, pereopod 7 longest ................................................................. *Psammonyx*
   — Articles 2-3 of antenna 1 each shorter than article 1 of flagellum, pereopod 5 slightly shorter than pereopod 6, latter longest ................................................. *Wecomedom*
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Special Groups and Keys

Conicostomatinae Group

See Lowry & Stoddart (1983a).

Body robust, coxae deep, legs stocky, urosome small and compact. Head small, often concealed by coxa 1 and pereonite 1. Mouthparts forming conical group. Antennae short, calceoli absent. Incisor smooth or tapering to sharp point; molar small or absent. Outer plate of maxillipeds large and dominating mouthparts, dactyl small or absent. Posteroventral lobe of coxa 4 large. Gnathopod 1 simple. Socarnoides included by Lowry & Stoddart (1983a) but we include it here only provisionally and without conviction.

Key to the Genera of Conicostomatins

1. Uropod 3 biramous .......................................................................................................................... 2
   — Uropod 3 without rami or rami vestigial ................................................................................... 6
2. Antenna 1, accessory flagellum nearly as long as primary flagellum; mandibular palp attached just proximal to molar ................................................................. 3
   — Antenna 1, accessory flagellum half or less than half length of primary flagellum; mandibular palp attached extremely proximally ...................................................................... 5
3. Epistome strongly produced; mandible with small accessory spines ................................... Socarnoides
   — Epistome not strongly produced; mandible without accessory spines ..................................... 4
4. Maxilla 1, palp well developed, 2-articulate ................................................................. Shackletonia
   — Maxilla 1, palp small, 1-articulate .................................................................................. Acidostoma
5. Urosome not compressed; uropods 1-3, rami subequal in length; maxillipedal palp 4-articulate .................................................................................. Phoxostoma
   — Urosome compressed; uropods 1-3, inner ramus reduced; maxillipedal palp 3-articulate ................................................................. Conicostoma
6. Maxillipeds, inner plate elongate, styliform or substyliform .................................................. 7
   — Maxillipeds, inner plate short, subquadrate ........................................................................ 8
7. Most of head visible; inner ramus of uropods 1 and 2 reduced or absent; telson flat .............. Ocosingo
   — Head completely concealed by pereonite 1 and coxa 1; rami of uropods 1 and 2 subequal in length; telson hemiacetabulate ................................................................. Stomacontion
8. Head concealed by pereonite 1 and coxa 1; outer plate of maxillipeds with smooth cutting edge .................................................................................. Acontiostoma
   — Most of head visible; outer plate of maxillipeds serrate distomedially .................................. Scolopostoma
Cyphocarin Group

This group of pelagic Lysianassidae is characterised very loosely by the small size of both coxae 1 and 2 (occasionally 3) and the large size of coxa 4 (usually 3 also), but one genus, Metacyclocaris has only coxa 1 reduced and it therefore bridges over to other lysianassid groups. Cyphocaris itself has coxae 1 to 3 reduced. Most cyphocarins, except Cyphocaris itself, are also recognisable from the prehensility of pereopods 3 and 4 (and often 5, rarely 6 or 7), this grasping condition being reflected in the swollen and spiny propodus of the affected pereopods. Most of the cyphocarins also have grotesque heads, tall and anteroposteriorly compressed, often with strange lobations; however, such taxa as Crybeloccephalus and Metacyphocaris have hooded heads which are less grotesque and might not be recognisable as of cyphocarin proportions. The group is therefore not totally discrete from other lysianassids.

Four of the genera have calychnophores on antenna 1 and at least two genera have strong calceoli but, strangely, most of the genera lack these devices which would seem to be so well adapted to errant pelagonts. Most of the taxa are assumed to be associated with hosts because of prehensile pereopods, and may be so sedentary that navigational devices are unnecessary; however, there is no observational evidence of this possibility.

The evolutionary trends proceed from triturative molar (Cyphocaris) to its reduction in Cyclocaris and loss elsewhere; from rakers (Cyphocaris) to reduction and loss elsewhere; from mandibular palp (several genera) to loss; from calychnophore on antenna 1 plus accessory flagellum to loss of calychnophore (Cyphocaris, Cyclocaris, etc.) and reduction or loss of accessory flagellum (most genera); from strongly setose maxillae (Cyclocaris) to poorly setose maxillae; from expanded bases of pereopods 5-7 to loss of expansion in such genera as Cyphocaridioides; from elongate cleft telsons to short unclft telsons; from aqurimous uropod 3 to parviramous states; even one genus, Crybelocyphephalous, has urosomites 2 to 3 fused together; several, like Mesocyclocaris have the inner plate of the maxilliped reduced.

Many cyphocarins have 1 to 3 medium-sized notches on the inner rami of uropod 3. Because these do not appear to have much taxonomic value, the normal reference to these in the diagnoses of cyphocarins is omitted.

Bathyamaryllis has most of the aspects of cyphocarins but maxilla 1 lacks the palp, and article 2 of antenna 1 is elongate.

Key 1 to the Genera of the Cyphocarins

1. Most of uropod 3, telson and most of maxillipedal palp absent ................................................................................................................................................ 2
   —Most of uropod 3, telson and most of maxillipedal palp present (go also to key 2) ........................................................................................................... 4

2. Inner rami of uropods 1-2 as long as outer, coxae 3-7 small and discontiguous, inner plates of maxillae 1-2 with thick setae .......................................................................................................................................................... Thoriella
   —Inner rami of uropods 1-2 short or vestigial, coxae 3-7 large and overlapping, inner plates of maxillae 1-2 with thin setae ............................................................................................................................................................... 3

3. Pereonites not hugely swollen, articles in flagella of antennae bead-like, outer ramus of uropods 1-2 flabellate................................................................. Chevreuxiella
   —Pereonites 3-6 hugely swollen, articles in flagella of antennae rectangular, outer ramus of uropods 1-2 lanceolate ............................................................. Danaella

4. Article 2 of antenna 1 elongate and palp of maxilla 1 absent ................................................................................................................................. Bathyamaryllis
   —Article 2 of antenna 1 not elongate and maxilla 1 with palp ............................................................................................................................. 5

5. Base of primary flagellum on antenna 1 with calychnophore ........................................................................................................................... 6
   —Base of primary flagellum on antenna 1 without calychnophore ......................................................................................................................... 10
6. Coxa 3 short like coxae 1-2 and mostly covered by coxa
   
   Coxa 3 large .................................................................................................................. 7

7. Mandibular palp absent ............................................................................................... Mesocyclocaris
   
   Mandibular palp present ............................................................................................... 8

8. Coxae 1-2 small ........................................................................................................... 9
   
   Only coxa 1 small ........................................................................................................... Metacyclocaris

9. Inner plate of maxilla 1 strongly setose, mandibular palp opposite molar .................. Cyclocaris
   
   Inner plate of maxilla 1 naked, mandibular palp attached proximally (molar may be absent) .................................................................................................................. Lepidepecreella

10. Coxa 3 as small as and as hidden as coxae 1-2 ......................................................... Pseudocyphocaris
   
   Coxa 3 large and not hidden .......................................................................................... 11

11. Telson cleft ................................................................................................................. 12
   
   Telson entire .................................................................................................................. 16

12. Telson deeply cleft (five eights+) ............................................................................. 13
   
   Telson weakly cleft (one third-) .................................................................................. 14

13. Head ordinary, molar present, pereopods simple ....................................................... Procyphocaris
   
   Head grotesque, molar absent, pereopods 3-6 prehensile ........................................... Paracyphocaris

14. Article 2 of pereopods 5-7 well expanded, coxae 3-6 large ....................................... 15
   
   Article 2 of pereopods 5-7 unexpanded, coxae 1-7 all tiny ........................................... Cyphocarioides

15. Mandibular palp and rakers absent, telson elongate ................................................... Metacyphocaris
   
   Mandibular palp and rakers present, telson short ......................................................... Mesocyphocaris

16. Rami of uropod 3 subequally extended, (article 2 of pereopod 5 thin and distinct from pereopods 6-7), mandibular palp absent ......................................................... Crybelocephalus
   
   Uropod 3 parviramous, inner ramus thus short, (article 2 of pereopod 5 like that of pereopods 6-7 or not), mandibular palp 3-articulate ......................................................... 17

17. Urosomites 2-3 separate, article 2 of pereopods 5-7 rectangular .............................. Cebocaris
   
   Urosomites 2-3 fused together, article 2 of pereopods 5-7 ovate ................................... Crybelocephocaris
Key 2 to the Genera of Cyphocarins

1. Urosomites 2 and 3 coalesced ................................................................. Crybelocyphocaris
   — Urosomites 2 and 3 separate ................................................................ 2
2. Mandible lacking palp ............................................................................. 3
   — Mandible bearing palp ........................................................................ 5
3. Pereopods 4-5 prehensile, article 6 of gnathopod 1 shorter than article 5 Mesocyclocaris
   — Pereopods 4-5 not prehensile, articles 5 and 6 of gnathopod 1 subequal ................................................................. 4
4. Telson entire ............................................................................................ Crybelocephaulus
   — Telson cleft ......................................................................................... Metacyphocaris
5. Uropod 3 inner ramus strongly reduced or absent ...................................... 6
   — Uropod 3 rami subequal to each other, well developed ........................ 8
6. Pereopods simple ...................................................................................... Lepidepecreella
   — Pereopods prehensile .......................................................................... 7
7. Telson cleft ............................................................................................... Mesocyphocaris
   — Telson entire ....................................................................................... Cebocaris
8. Coxa 2 much larger than 1 and covering it but coxae 3-4 small, not covering anterior coxae Metacyclocaris
   — Some of coxae 1-2 or 1-3 covered either by 3 or 4, coxa 4 large .......................... 9
9. Coxae 1-3 all small and hidden by coxa 4 .................................................... 10
   — Coxa 3 large and freely visible ................................................................ 11
10. Article 2 of pereopod 3 large, deeply indentured or with very long, simple posterodistal tooth Cyphocaris
    — Article 2 of pereopod 3 not deeply indentured, thin, linear, not ornamented Pseudocyphocaris
11. Some pereopods prehensile ................................................................. Paracyphocaris
    — Pereopods simple ............................................................................... 12
12. Mandible bearing triturative molar ......................................................... Procyphocaris
    — Mandible lacking distinct molar or with conicolaminate and unridged molar ................................................................. 13
13. Article 3 of gnathopod 1 elongate, maxillae 1-2 strongly setose medially, article 2 of antenna 1 very short Cyclocaris
    — Article 3 of gnathopod 1 not elongate, maxillae 1-2 not medially setose, article 2 of antenna 1 elongate ........................................... Bathymaryllis
Lysianassins Group

This set of keys includes many non-lysianassin genera which have general similarities but usually possess one or more characters not typical of lysianassins, such as deeply cleft telson; the characters of lysianassins include large mouthparts arranged in a quadrate bundle, prebuccal mass with large lobe on upper lip seen from lateral view (the epistome may or may not also have a large lobe), simple gnathopod 1, proximally situated palp of mandible, unreduced coxa 1, and uncleft telson.

Basic Key to the Genera of Lysianassins and Analogues

A. Inner ramus of uropod 3 very short, or in male both rami very short ................................................................. Parawaldeckia
   — Inner ramus of uropod 3 not greatly shortened ......................................................... B
B. Epistome and upper lip together or separately forming sharp process ................................................................. C
   — Prebuccal mass not anteriorly sharp ........................................................................ D
C. Telson emarginate ........................................................................................................ Paralysianopsis
   — Telson deeply cleft ................................................................................................. Parschisturella
D. Epistome fully dominating upper lip ............................................................................... E
   — Epistome not dominant .......................................................................................... F
E. Dactyl of maxilliped ordinary, urosomites 2-3 coalesced ............................................... (?Parambasia) Pseudambasia
   — Dactyl of maxilliped vestigial, urosomites separate .................................................. Nannonyx
F. Article 2 of pereopod 6 lobate anteriorly and posteriorly, dactyls of pereopods 6-7 elongate .................................................................................................................. Rhinolabia
   — Article 2 of pereopod 6 not grossly lobate, dactyl of pereopods 6-7 not elongate ............ Keys 1, 2, 3

Key 1 to the Genera of Lysianassins

1. Telson cleft one third or more .................................................................................. 2
   — Telson cleft one fourth or less .................................................................................. 7
2. Upper lip projecting much farther than epistome ........................................................ Socarnes
   — Upper lip and epistome projecting forward equally .................................................. 3
3. Inner ramus of uropod 2 with notch ........................................................................... 4
   — Inner ramus of uropod 2 without notch .................................................................. 5
4. Palp of maxilliped not exceeding outer plate, mouthparts arranged in conical group ................................................................. Socarnoides
   — Palp of maxilliped exceeding outer plate, mouthparts arranged in quadrate group .......... Concarnes
5. Base of primary flagellum on antenna 1 without callynophore .......................................................... Septcarnes
   — Base of primary flagellum on antenna 1 with callynophore, thus elongate ............................................. 6
6. Carpus and propodus of gnathopod 1 subequally long ................................................ Socarnopsis
   — Carpus of gnathopod 1 much shorter than propodus ........................................................................... Waldeckia
7. Outer ramus of uropod 3 with 2 articles .................................................................................................... 8
   — Outer ramus of uropod 3 with 1 article ..................................................................................................... 11
8. Peduncle of uropod 3 flat but not laterally plate-like, inner ramus about two thirds as long as outer ramus, prebuccal parts apparently not divided ................................................ Kakanui
   — Peduncle of uropod 3 plate-like (Fig. 93C) inner ramus three-fourths or more as long as outer ramus, prebuccal parts divided ........................................................................................................... 9
9. Epistome projecting as far as upper lip .................................................. Dissiminassa
   — Upper lip projecting much farther than epistome ....................................................................................... 10
10. Antenna 2 of male elongate .......................................................................................................................... Aruga
    — Antenna 2 of male not elongate ................................................................................................................. Lysianopsis
11. Uropod 1 densely setose .................................................................................................................................. 12
    — Uropod 1 not setose .................................................................................................................................... 13
12. Epistome produced as far as upper lip, outer plate of maxilla 2 dominant ............................................. Bonassa
    — Upper lip strongly exceeding epistome, inner plate of maxilla 2 dominant .............................................. Dartenassa
13. Inner ramus of uropod 2 simple .................................................................................................................... Pronannonyx
    — Inner ramus of uropod 2 with notch ........................................................................................................... 14
14. Gnathopod 1 large and falcate or gnathopod 1 with palm ........................................................................ 15
    — Gnathopod 1 ordinary and simple ................................................................................................................ 16
15. Prebuccal parts small, barely separate, epistome greatly dominating upper lip ........................................ Pseudambasia
    — Prebuccal parts large, upper lip dominant .................................................................................................. Falcarussa
16. Article 3 of gnathopod 1 slightly elongate ................................................................................................. Parambasia
    — Article 3 of gnathopod 1 not elongate ......................................................................................................... 17
17. Small prebuccal mass with epistome fully dominant and over-riding tiny upper lip ................................ Pseudambasia
    — Large prebuccal mass with upper lip dominant or upper lip and epistome equally dominant .......... 18
18. Epistome extending as far as upper lip .............................................................. 19
   — Upper lip dominant .......................................................................................... 20
19. Article 1 of antenna 1 with tooth ...................................................................... Socarnella, Lysianassa
   — Article 1 of antenna 1 lacking tooth ............................................................... Macronassa
20. Article 1 of antenna 1 lacking tooth ................................................................. Shoemakerella, Arugella
   — Article 1 of antenna 1 with tooth ................................................................ Lysianassa

Key 2 to the Genera of Lysianassins

1. Inner ramus of uropod 2 lacking notch ................................................................ 2
   — Inner ramus of uropod 2 with notch ................................................................ 9
2. Outer plate of maxilla 2 geniculate, mouthparts in conical bundle ......................... Phoxostoma
   — Maxilla 2 normal, mouthparts in quadrate bundle .......................................... 3
3. Uropods 1-2 setose, antenna 1 with tooth ............................................................ 4
   — Uropods 1-2 not setose, antenna 1 without tooth ............................................ 5
4. Epistome not produced, outer plate of maxilla 2 narrow ...................................... Dartenussa
   — Epistome produced, outer plate of maxilla 2 broad ........................................ Bonassa
5. Telson cleft one half+ ....................................................................................... 6
   — Telson entire ...................................................................................................... 8
6. Epistome not produced, article 2 of palp on maxilliped reaching apex of outer plate, base on flagellum of antenna 1 without callynophore ................................................ Socarnes
   — Epistome produced, article 2 of palp on maxilliped barely reaching apex of outer plate or less, (base on flagellum of antenna 1 with or without callynophore) ................ Waldeckia, Socarnopsis
7. Primary flagellum of antenna 1 with callynophore, outer plate of maxilliped exceeding article 2 of palp ......................................................... Waldeckia, Socarnopsis
   — Primary flagellum of antenna 1 without callynophore, outer plate of maxilliped barely exceeding article 2 of palp .............................................................. Septcarnes
8. Palp of maxilliped short, uropod 3 short ............................................................ Pronannonyx
   — Palp of maxilliped long, uropod 3 long ............................................................ Parambasia
9. Peduncle of uropod 3 elongate, not expanded .................................................... 10
   — Peduncle of uropod 3 short and/or plate-like ................................................... 16
10. Antenna 1 with tooth ................................................................. 11
   — Antenna 1 without tooth .................................................. 13
11. Telson with small notch .......................................................... Socarnella
   — Telson entire ................................................................. 12
12. Epistome extending as far as upper lip .................................... Lysianassina
   — Upper lip dominant ...................................................... Lysianassa
13. Dominant epistome lobulate over tiny upper lip, male gnathopod 1 subchelate, female simple, urosomites 2-3 coalesced ...................... Pseudambasia
   — Upper lip large, epistome not dominant, male gnathopod 1 not subchelate, female simple, urosomites 2-3 separate ....................... 14
14. Epistome produced as far as upper lip ...................................... 15
   — Epistome not produced, (palp of maxilliped long, telson entire) .............................................................. Arugella
15. Palp of maxilliped very short, telson cleft one third .................... Socarnoides
   — Palp of maxilliped ordinary, telson entire ............................ Dissiminassa
16. Outer ramus of uropod 3 2-articulate ...................................... 17
   — Outer ramus of uropod 3 1-articulate .................................. 20
17. Epistome produced as far as upper lip ...................................... 18
   — Epistome not produced .................................................. 19
18. Telson cleft one third+ .......................................................... Concarnes
   — Telson entire ............................................................... Dissiminassa, Kakanui
19. Male antenna 2 elongate .......................................................... Aruga
   — Male antenna 2 not elongate ............................................ Lysianopsis
20. Epistome produced, inner ramus of uropod 3 often small ............... Macronassa
   — Epistome not produced, inner ramus of uropod 3 large ...................... 21
21. Plates of maxilla 2 equally broad, gnathopod 1 falcate ................... Falcanaessa
   — Inner plate of maxilla 2 broader than outer plate, gnathopod 1 not falcate ............................................................ 22
22. Article 1 of antenna 1 with tooth ............................................ Lysianassa
   — Article 1 of antenna 1 without tooth ................................... 23
23. Uropod 3 of male with notch on peduncle ................................. Shoemakerella
   — Uropod 3 of male ordinary .............................................. Arugella
Key 3 to the Genera of Lysianassins

1. Antenna 1 with tooth .......................................................... 2
   — Antenna 1 without tooth .................................................. 7
2. Uropods 1-2 not densely setose ........................................ 3
   — Uropods 1-2 densely setose ........................................... 5
3. Telson with notch .................................................. Socarnella
   — Telson entire .......................................................... 4
4. Epistome slightly to strongly produced .................. Lysianassina
   — Epistome unproduced .................................................. Lysianassa
5. Outer plate of maxilla 2 geniculate, mouthparts arranged
   in conical bundle .................................. Phoxostoma
   — Outer plate of maxilla 2 not geniculate, mouthparts
   arranged inquadrate bundle .............................................. 6
6. Outer plate of maxilla 2 thin, epistome not produced .......... Dartenassa
   — Outer plate of maxilla 2 broad, epistome produced .......... Bonassa
7. Uropod 1 setose .................................................. Phoxostoma
   — Uropod 1 not setose .......................................................... 8
8. Inner ramus of uropod 2 without notch, telson uncleft ........... 9
   — Inner ramus of uropod 2 without notch, telson deeply
   cleft ........................................................................ 10
   — Inner ramus of uropod 2 with incision, telson poorly cleft
   or entire ........................................................................ 12
9. Palp of maxilliped short, uropod 3 short ......................... Pronannonyx
   — Palp of maxilliped long, uropod 3 long ......................... Parambasia
10. Primary flagellum without callynophore, outer plate of
    maxilliped almost reaching end of palp article 2, epistome
    as long as upper lip .................................................. Septcarnes
    — Primary flagellum with callynophore, outer plate of
    maxilliped exceeding article 2 of palp, epistome produced .... 11
    — Primary flagellum 1 without callynophore, outer plate of
    maxilliped not exceeding article 2 of palp, epistome not
    produced .................................................. Socarnes
11. Gills pleated, carpus of gnathopod 1 as long as propodus .......... Socarnopsis
    — Gills not pleated, carpus of gnathopod 1 much shorter
    than propodus .................................................. Waldeckia
12. Peduncle of uropod 3 unexpanded ................................................................. 13
   — Peduncle of uropod 3 expanded and plate-like ................................................. 15
13. Epistome much more dominant than tiny upper lip, 
urosomites 2-3 coalesced ............................................................... (?Parambasia) Pseudambasia
   — Upper lip large, not dominated by epistome ..................................................... 14
14. Peduncle of uropod 3 short, epistome produced .............................................. Kakanui, Dissiminassaa
   — Peduncle of uropod 3 long, epistome not produced ........................................ Arugella
15. Outer ramus of uropod 3 2-articulate .............................................................. 16
   — Outer ramus of uropod 3 1-articulate ............................................................. 19
16. Epistome produced .......................................................................................... 17
   — Epistome not produced .................................................................................... 18
17. Outer plate of maxilliped rounded, palp long ................................................. Concarnes
   — Outer plate of maxilliped pointed, palp short ............................................... Socarnoides
18. Male antenna 2 elongate ............................................................................... Aruga
   — Male antenna 2 not elongate ...................................................................... Lysianopsis
19. Epistome produced ......................................................................................... Macronassaa
   — Epistome not produced ................................................................................ Macronassaa
20. Gnathopod 1 falcate ...................................................................................... Falcanassaa
   — Gnathopod 1 not falcate ................................................................................
21. Inner plate of maxilla 2 wide, outer plate of maxilla 1 
with 7 + 20 spines, peduncle of terminal male uropod 3 
with deep notch ................................................................................ Shoemakerella
   — Inner plate of maxilla 2 very wide, outer plate maxilla 1 
with 7 + 4 spines, uropod 3 of male without large 
peduncular notch ................................................................................ Arugella

**Pachynin Group**

Lysianassidae with enlarged gnathopod 1 bearing compressed article 5 (carpus) and enlarged 
article 6 (propodus); body vermiform; antennae very short and stout, flagella with few articles; calceoli absent.

**Key to the Genera of Pachynins**

1. Maxilla 1, outer plate with most spine-teeth sculptured; 
   maxilla 2 long, thin, tapering distally ......................................................... 2
   — Maxilla 1, outer plate with spine-teeth smooth; maxilla 2 
   short, plates usually subquadrate, occasionally tapering ............................. 4
2. Maxilla 1, palp 1-2 articulate, with several terminal setae; uropod 3 uniramous .......................................................... Sheardella —Maxilla 1, palp absent or vestigial; uropod 3 biramous, inner ramus may be vestigial .................................................. 3

3. Mandible, serrate blade present; palp of maxilliped 4-articulate .......................... Drummondia —Mandible, serrate blade absent; palp of maxilliped 3-articulate .................................................. Prachynella

4. Gnathopod 1 with simple or complex spine defining palm ....................................... 5 —Gnathopod 1 with produced tooth or nothing defining palm ........................................... 7

5. Maxilla 1, palp present; maxilliped, inner plates present ........................................ 6 —Maxilla 1, palp absent; maxilliped, inner plates absent ........................................... Ekelofia

6. Antenna 1, flagellum without fused proximal articles bearing aesthetascs; maxilla 1, outer plate with 10 spine-teeth, palp with terminal setae; gnathopod 1, palm defined by simple spine .................................................. Figorella —Antenna 1, flagellum with fused proximal articles bearing aesthetascs; maxilla 1, outer plate with 7-8 spine-teeth, palp with terminal spines; gnathopod 1, palm defined by complex spine ........................................................................... Pachynus

7. Maxilla 1, palp absent; maxilliped, inner plates absent; coxa 4, posterovernal lobe absent .................................................. Pachychelium —Maxilla 1, palp present; maxilliped, inner plates present; coxa 4, posterovernal lobe well developed .......................................................... Acheronia

**Scopelocheirins**

Lysianassids with gnathopod 1 of form in Figure 90J in which apex of article 6 and dactyl are shrouded by setae arising from either article; does not include a few genera in which this condition is primitive or vestigial, such as Lucayarina.

**Key to the Genera of Scopelocheirins**

1. Gnathopod 1 stout and minutely and transversely subchelate or chelate, palp article 4 of maxilliped stout and subclavate .......................................................... Pseudoanonyx —Gnathopod 1 slender and simple, or palm very oblique, palp article 4 of maxilliped slender and claw-like .......................................................... 2

2. Antenna 1 peduncle with 1+ teeth, inner ramus of uropod 2 with constriction .................................................. Ichnopus —Antenna 1 peduncle untoothed, inner ramus of uropod 2 simple .......................................................... 3
3. Mandible lacking molar, article 6 of pereopods 3-4 slightly longer than articles 4 and 5 combined and slightly prehensile ................................................................. Scopelocheiropsis
—Mandible bearing molar, article 6 of pereopods 3-4 shorter than or equal to articles 4 and 5 combined ............................................................. 4
4. Gnathopod 2 minutely chelate ............................................................... 5
—Gnathopod 2 subchelate ............................................................................ 6
5. Coxae 1-4 densely setose below, palp of maxilla 1 with stiff plumose seta apically amidst spines, outer plate of maxilla 2 wide and truncate ................................................................. Aroui
—Coxae 1-4 not densely setose below, palp of maxilla 1 without special seta, outer plate of maxilla 2 narrow and rounded ...........................................................(= Bathycallisoma) Scopelocheirus
6. Article 2 of gnathopod 1 swollen, glandular, antenna 1 evenly coniform to apex ................................................................. Eucallisoma
—Article 2 of gnathopod 1 linear, not glandular, antenna 1 unevenly articulate ................................................................................... 7
7. Inner plate of maxilla 1 setose only terminally and subterminally, dactyl of gnathopod 1 not distinct from cirri, outer plate of maxilla 1 with 4 spines ................................................................. Paracallisomopsis
—Inner plate of maxilla 1 setose medially, dactyl of gnathopod 1 distinct from cirri, outer plate of maxilla 1 with 9-11 spines ................................................................. Paracallisoma

Acheronia Lowry

Acheronia Lowry, 1984b: 92.

Type species. Acheronia pegasus Lowry, 1984b, original designation.

Diagnosis. Of pachynin form. Mouthparts forming conical bundle. Labrum and epistome continuous, not differentially produced. Incisor ordinary, molar absent; palp attached slightly proximal. Inner plate of maxilla 1 weakly (2) setose; palp 2-articulate, large. Inner poorly and outer plates of maxilliped well developed, palp slightly exceeding outer plate, dactyl well developed. Coxa 1 large and visible, Gnathopod 1 strongly enlarged, poorly chelate, article 5 very short to absent, dactyl large; article 6 of gnathopod 2 slightly shorter than article 5, ordinary. Inner ramus of uropod 2 without notch. Uropod 3 short, peduncle ordinary, inner ramus strongly shortened, outer ramus 2-articulate. Telson short, entire.

Additional characters. Base of flagellum on antenna 1 articlar; mandible with rakers, toothed blade absent, lacinia mobilis absent; spines on outer plate of maxilla 1 simple, 6; palp with apical setae; coxa 4 with well-developed posteroventral lobe; gnathopod 1 palm defined by projecting tooth (chelate); pereonite 5 [?] with dorsal tooth.

Relationship. Differing from Figorella in the absence of lacinia mobilis, reduced spine formula on outer plate of maxilla 1, and lacking a spine defining the palm of gnathopod 1.

Species. Acheronia pegasus Lowry, 1984b [776].

Habitat and distribution. Marine, Stewart Island, New Zealand, 42 m, 1 species.

Acidostoma Liljeborg

Figs 86F, 89P, 90E, 91B, 94A, 95s


Type species. Anonyx obesus Bate, 1862, monotypy.
**Diagnosis.** Of conicostomin form. Mouthparts forming conical bundle, styliform. Labrum and epistome continuous, not differentially produced, coalesced. Incisor of ordinary width but minutely toothed, molar simple, small or absent (type); palp attached proximal to molar. Inner plate of maxilla 1 weakly (2 setules) setose; palp 1-articulate, obsolescent. Inner poorly and outer plates of maxilliped well developed, palp scarcely forming outer plate, dactyl vestigial. Coxa 1 large and visible, not tapering. Gnathopod 1 nearly simple, articles 5 and 6 subequal, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, both elongate, propodus with transverse palm but article 7 absent or vestigial. Inner ramus of uropod 2 without notch. Uropod 3 short.
peduncle ordinary, inner ramus slightly shortened, outer ramus 1 to 2-articulate. Telson short, cleft or emarginate.

Additional characters. Head visible; antenna 1 very stout in male, article 1 of primary flagellum with callynophore; accessory flagellum well developed; mandible lacking rakers; spines on outer plate of maxilla 1 fused and hook-like; outer plate of maxilliped folded around other mouthparts; article 4 of pereopods 5-7 strongly expanded posteriorly; gill of pereopod 7 absent; peduncle of uropod 2 expanded and platelike; telson flat.

Fig. 87. Lysianassidae. A, Lepidepecreum umbo; B, Pachychelium davidis; C, Onesimoides chelatus; D, Trischizostoma nicaense; E, Crybelocyphocaris tattersalli.
Sexual dimorphism. Male primary flagellum with calceoliform; flagellum of antenna 2 not elongate.

Variables. Incisor deeply toothed in juvenile (A. ortum); outer plate of maxilliped incised (A. neglectum), not incised (A. laticorne, etc.); peduncle of uropod 2 castellate (A. pectinata); peduncle of uropod 3 plate-like (A. hancockii); telson and rami of uropod 3 very short (A. molariferum); telson cleft (A. obesus, etc.) or emarginate (A. laticorne, etc.).

Relationship. A primitive conicostomatid. Differing from Shackletonia in the small, 1-articulate palp of maxilla 1 and the unclenched telson. From Socarnoides in the unproduced epistome and lack of rakers on the mandible.


Habitat and distribution. Marine, cold water arctic, boreal, warm temperate to West African tropics, 0-2398 m, often associated with sea anemones, 7 species.

Acontiostoma Stebbing

Fig. 95G


Type species. Acontiostoma marionis Stebbing, 1888, original designation.

Diagnosis. Of conicostomatid form. Mouthparts forming conical bundle, styliform. Labrum and epistome differentially produced, separate, labrum strongly dominant in projection and sharp. Incisor ordinary, molar absent; palp attached strongly proximal. Inner plate of maxilla 1 weakly (1) setose; palp 1-articulate, large or small. Inner poorly and outer plates of maxilliped well developed, palp slightly exceeding outer plate, dactyl vestigial. Coxa 1 large and visible, not tapering. Gnathopod 1 simple, article 5 shorter than 6, dactyl large; article 6 of gnathopod 2 slightly shorter than article 5, ordinary, hand minutely chelate. Inner rami of uropod 2 without notch. Uropod 3 short, peduncle ordinary, 1 tiny ramus present or absent (type). Telson hemiacetabulate, weakly cleft or emarginate or entire.

Additional characters. Head concealed by peroneite 1 and coxa 1; antenna 1 narrow; accessory flagellum 2-articulate; flagellum of antenna 2 short; rakers present; spines on outer plate of maxilla 1 reduced to about 4; inner plate of maxilliped short and quadrangular (versus Stomacontion). with apical cusp, outer plate with large apical cutting edge; coxa 1 huge and hiding small head; dactyl of gnathopod 1 with inner denticles; palm of gnathopod 2 hollowed; article 4 of pereopods 5-7 strongly expanded posteriorly, article 5 very short; inner rami of uropods 1-2 slightly shortened; telson strongly spinose.

Sexual dimorphism. Protandrous hermaphrodites; adult female with oostegites and penes; secondary males rare, eyes enlarged, primary flagellum with calceoliform but no calceoli; mouthparts degenerate.

Variables. Body smooth (A. marionis), tuberculate (A. tuberculata); palp of maxilla 1 elongate (A. marionis), short (A. tuberculata); outer plate of maxilliped tapering (type), rounded (A. tuberculata); urosomite 1 with boss rounded (type), acute (A. tuberculata).

Relationship. “The most apomorphic conicostomatid” (Lowry & Stoddart, 1983a), with the most modified mouthparts, concealed head, large coxae, loss of rami on uropod 3 and shape of telson. Closest to Stomacontion, but differing in concealed head, non-styliform inner plate of maxilliped and oddly hollowed palm of gnathopod 2.


Habitat and distribution. Marine, austral, 0-183 m, often associated with sponges, 3 species.

Adeliella Nicholls

Fig. 91E

Adeliella Nicholls, 1938: 12.--De Broyer, 1975b: 73.

Type species. Adeliella laticornis Nicholls, 1938, original designation.

Diagnosis. Mouthparts forming quadrangular bundle. Labrum and epistome separate, neither strongly dominant in size nor projection, blunt. Incisor ordinary, molar
triturative, small; palp attached proximal to molar. Inner plate of maxilla 1 naked; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl small, subunguiform, with 2 subapical setae. Coxa 1 scarcely shortened and slightly covered by coxa 2, scarcely tapering. Gnathopod 1 short, strongly subchelate, palm oblique, article 5 slightly shorter than 6, weakly lobate, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, article 6 very thin, palm chelate, dactyl large and overlapping palm. Inner ramus of uropod 2 without notch. Uropod 3 ordinary, peduncle ordinary,

**Fig.88.** Lysianassidae. A, Hippomedon denticulatus; B, Metacyphocaris helgae; C, Parawaldeckia kidderi; D, Danaella mimonectes; E, Socarnoides kerqueleni; F, Lepidepecreoides xenopus; G, Kerguelenia borealis; H, Lysianassa plumosa; I, Eurythenes gryllus.
inner ramus strongly shortened, outer ramus 2-articulate. Telson short, weakly to deeply cleft.

Additional characters. Antennae very short; outer plate of maxilla 1 with 6 spines; maxilla 2 feebly, inner plate pointed, with 1 apical seta, outer plate tapering, with 3 apical setae; palm of gnathopod 2 short, transverse, but dactyl stout and strongly overlapping palm; rami of uropod 1 much shorter than peduncle; rami of uropod 3 not longer than peduncle.

Variables. Epistome protruding beyond upper lip (especially A. takoradia); carpus of gnathopod 2 with posterodistal pellucid lobe (A. laticornis, A. takoradia), lobe absent (A. olivieri); article 2 on outer ramus of uropod 3 tiny and spine-like (A. takoradia); telson cleft 40% (A. takoradia), 20% (type).

Relationship. Characterised by the naked or poorly setose inner plate of maxilla 1 and the plates of maxilla 2, with 6 or fewer spines on the outer plate of maxilla 1; the elongate or overlapping dactyl of gnathopod 2; also the rami of uropod 3 are exceptionally short and thus differ from Boeckosimus, Lepidepecreopsis, Uristes, Tryphosella, Hippomedon, Aristiopsis, Paronesimus and Ambasiopsis.

Because of the weakly reduced coxa 1 and barely proximal mandibular palp this genus terminates in Keys J, L, M, O, P, Q of J.L. Barnard (1969c).

Close to Orchomene in terms of palpable characters but differing in the reduction or size or setosity of the inner plate of maxilla 1, plates of maxilla 2, slight taper of coxa 1, weaker posteroventral lobe on coxa 4 but contrary to De Broyer, gnathopod 2 quite similar to Orchromene (see Sars, 1895: pl.22, O. batei); though dactyl of Adeliella enlarged (an apomorph), outer plate of maxilla 1 with only 6 spines.

Differing from Tryphosoides in the 2-articulate outer ramus of uropod 3 and more proximal mandibular palp. From Hippomedon and relatives furthermore in the very short antennae, small posteroventral lobe on coxa 4, short rami of uropod 1, shorter rami of uropod 3, stubby dactyl on the maxillipedal palp and the unproduced epimeron 3.

Pseudorchomene has elongate articles 3, 5 and 6 on gnathopod 1.

Pseudokoroga has very poorly developed armament on the inner plate of maxilla 1 and maxilla 2 but differs from Adeliella in the short dactyl of gnathopod 2, larger gnathopod 1 with shorter carpus bearing a larger lobe, and the inner ramus of uropod 2 is notched.

Paronesimus furthermore has a non-triturative molar and apically expanded coxa 1. Aristiopsis furthermore differs from Adeliella in the much smaller coxa 1 and weakly chelate gnathopod 1. Ambasiopsis (= Neoambasia) furthermore has a more strongly tapering coxa 1.

Species. See De Broyer (1975b, all species); A. laticornis Nicholls (1938) [870B = 805-808]; A. olivieri De Broyer, 1975b (Andres, 1979b, 1983) [870B]; A. takoradia (J.L. Barnard, 1961a) [408A].

Habitat and distribution. Marine, Antarctic and abyssal off Liberia, Africa, thus in frigid waters and tropically submergent, 200-5160 m, 3 species.

Alicella Chevreux

Fig.90K


Type species. Alicella gigantea Chevreux, 1899a, original designation.

Diagnosis. Mouthparts forming quadrate bundle. Labrum and epistome not prominent, separate, neither dominant in projection, blunt. Incisor ordinary, but with few inner corner teeth, and one middle tooth, molar simple, large, conicalaminate, setulose; palp attached strongly distal to molar. Inner plate of maxilla 1 strongly setose medially; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl well developed. Coxa 1 large and visible, weakly tapering. Gnathopod 1 short, simple, article 5 longer than 6, dactyl large; article 6 of gnathopod 2 slightly shorter than article 5, both very elongate and linear, hand minutely subchelate, article 7 strongly overlapping obsolete palm. Inner ramus of uropod 2 without notch. Uropod 3 acquiramous, ordinary, peduncle ordinary, outer ramus minutely 2-articulate. Telson elongate, deeply cleft.

Additional characters. Peduncle of antenna 2 very short, article 1 strongly swollen; rakers absent; maxilla 2 with medial facial row of setae; article 3 of gnathopod 1 elongate; dactyls of pereopods 3-7 very short.

Relationship. Differing from Paralicella in the simple gnathopod 1 and equal rami of uropods 1-2, probably in the short pereopodal dactyls, and the much shorter article 2 of the outer ramus on uropod 3. From Eurythenes in the simple gnathopod 1, elongate article 3 of gnathopod 1, larger coxa 1, and recognisable by the broader article 2 and narrower article 4 of pereopods 5-7.

Species. Alicella gigantea Chevreux, 1899a, 1935 (Barnard & Ingram, 1986) [304A]

Habitat and distribution. Marine, North Atlantic and Pacific [0] 1720-5865 m; up to 320 mm in length; 1 species.
Amaryllis Haswell


Type species. Amaryllis macroptalmus Haswell, 1879a, selected by Pirlot, 1933b.

Diagnosis. Mouthparts forming conical bundle but scarcely styliform. Labrum and epistome continuous, not differentially produced, coalesced. Incisor weakly and minutely toothed; molar simple, small, bulbous, setulose, palp attached slightly proximal to molar. Inner plate of maxilla 1 weakly (2) setose; palp 1-articulate, obsolescent. Plates of maxilla 2 with oblique apices setose apicomedially. Inner and outer plates of maxilliped well.
developed, pointed and striated; palp scarcely exceeding outer plate, dactyl vestigial. Coxa 1 strongly shortened and partly covered by coxa 2, latter also slightly reduced and tapering. Gnathopod 1 short, simple, articles 5 and 6 subequal, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus subchelate. Inner ramus of uropod 2 with large notch. Uropod 3 aequiramous, ordinary, peduncle slightly elongate, outer ramus 1-articulate. Telson ordinary, moderately cleft.

Additional characters. Article 1 of antenna 1 toothed, article 2 half as long as article 1 (Bathyamaryllis); anteroventral corner of coxa 4 rounded (Vijaya); article 3 of gnathopod 1 scarcely elongate.

Variables. Inner spines on outer plate of maxilla 1 short (A. macrophthalmus of Madagascar, A. bathycephaulus); posteroventral margin of coxa 4 rounded (A. bathycephaulus); posteroventral lobe of coxae 5-6 attenuated (A. bathycephaulus); dactyls of pereopods 3-4 elongate (A. bathycephaulus); outer ramus of uropod 3 with apical element (A. macrophthalmus of Madagascar).

Relationship. See 'Additional characters'.


Habitat and distribution. Marine, southern Australia, Magellan, Madagascar and austral islands, 0-221 m, 2 species.

Ambasia Boeck

Figs 86B, 89N, 91N


Type species. Gammarus atlanticus Milne Edwards, 1830, monotypy.

Diagnosis. Mouthparts forming quadrate bundle. Labrum and epistome continuous but differentially produced, prominent, coalesced, epistome part strongly dominant in size and projection, blunt. Incisor ordinary, molar absent; palp attached strongly proximal. Inner plate of maxilla 1 weakly (2) setose; palp 2-articulates, large. Inner and outer plates of maxilliped well developed, palp scarcely exceeding outer plate, dactyl vestigial. Coxa 1 slightly shortened and partly covered by coxa 2. Gnathopod 1 short, simple, articles 5 and 6 subequal, elongate; dactyl small; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 without notch. Uropod 3 ordinary, peduncle ordinary, inner ramus strongly shortened, outer ramus 2-articulate. Telson elongate, deeply cleft.

Additional characters. Flagella of antennae 1-2 short, article 1 of primary flagellum on antenna 1 as long as peduncle. Palp article 2 of maxilliped half or less as broad as outer plate (versus Ambasiella).

Relationship. See 'Additional characters'. Characterised by the reduced dactyl of the maxillipedal palp. Differing from Ambasiopsis in the simple gnathopod 1, the non-dominant upper lip in the prebuccal protrusion, and the maxillipedal dactyl. Differing from Centromedon in the coalesced prebuccal mass and the absence of a molar.

Species. Ambasia atlantica (Milne Edwards, 1830, 1840) (= A. marina Bate, 1857d) (= A. danielsseni Boeck, 1871b, 1876, Sars, 1895) (Stephensen, 1935a, 1940b) (Gurjanova, 1951) (Lincoln, 1979a) [216 + B].

Habitat and distribution. Marine, boreal east Atlantic and arctic, often on starfishes, 20-1400 m, 1 species.

Ambasiella Schellenberg

Ambasiella Schellenberg, 1935b: 15.

Type species. Ambasia murmanica Bruggen, 1906, monotypy.

Diagnosis. Mouthparts forming quadrate bundle. Labrum and epistome continuous but differentially produced, prominent, coalesced, epistome part strongly dominant in size and projection and subsharp. Incisor ordinary, molar absent; palp attached strongly proximal. Inner plate of maxilla 1 weakly (2) setose; palp 2-articulate, large. Incisor and outer plates of maxilliped well developed, palp scarcely exceeding outer plate, dactyl vestigial. Coxa 1 strongly shortened and partly covered by coxa 2, tapering. Gnathopod 1 short, simple, article 5 longer than 6, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 without notch. Uropod 3 short, peduncle ordinary, inner ramus slightly shortened, outer ramus 2-articulate. Telson ordinary, deeply cleft.

Additional characters. Antenna 1 dorsally carinate on article 1; midpalp of maxilliped as broad as outer
plate; urosomite 1 with blunt dorsal process.

**Relationship.** Differing from *Ambasia* in equality of breadth between outer plate and article 2 of palp on maxilliped. From *Menigrates* in the short articles 2-3 of the peduncle on antenna 1, the deeper cleft of the telson and the vestigial dactyl of the maxilliped. From *Nannonyx* in the broad maxillae 1-2 and maxilliped, deeply cleft telson, and long rami of uropod 3 (though reduced). From *Orchomene* in the vestigial dactyl of the maxilliped, fused prebuccal mass, lack of molar, and reduced coxa 1.

**Species.** *Ambasiella murmanica* (Bruggen, 1906)
(Schellenberg, 1935b) (Stephensen, 1935a, 1944a) (Gurjanova, 1951) [216 + B].

**Habitat and distribution.** Marine, north-east Atlantic across Arctic Siberia, 4-1026 m, 1 species.

**Ambasiopsis** K.H. Barnard

Fig.92N


**Type species.** *Ambasiopsis georgiensis* K.H. Barnard, 1932, original designation.

**Diagnosis.** Mouthparts forming quadrate bundle. Labrum and epistome differentially produced, prominent, separate, labrum strongly dominant in projection and blunt. Incisor ordinary, molar weakly triturative, also setulose, large; palp attached opposite molar. Inner plate of maxilla 1 weakly (2) setose, outer plate with 7 spines; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl well developed. Coxa 1 slightly shortened and partly covered by coxa 2, tapering. Gnathopod 1 short, poorly subchelate, palm oblique, articles 5 and 6 subequal, or 5 longer than 6, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, hand subchelate. Inner ramus of uropod 2 without notch. Uropod 3 aequiramous, ordinary, peduncle ordinary, outer ramus 2-articulate. Telson elongate, deeply cleft.

**Additional characters.** Dorsal carina present on article 1 of antenna 1 (type, etc.); outer plate of maxilla 1 with 7 or fewer spines (versus *Cedrosella*); largest medial seta on inner plate of maxilla 2 not basalmost; dactyl of gnathopod 1 with inner tooth; urosomite 1 with dorsal process.

**Variables.** Spination variable on outer plate of maxilliped, for example *A. tumicornis* with medial spination continuing onto apex.

**Relationship.** Differing from *Tryphosella* in the poorly spinose outer plate of maxilla 1. From *Schisturella* in the absence of a notch on the inner ramus of uropod 2, the more deeply cleft telson and the poorly spinose outer plate of maxilla 1. From *Aristiasis* in the poorly setose inner plate of maxilla 1 and the subchelate gnathopod 1. From *Metambasia* in the non-tumid male article 3 of antenna 2, the subchelate gnathopod 1 and the lack of notch on the inner ramus of uropod 2.

See *Cedrosella* and *Ventiella*.

**Removal.** *Ambasiopsis fomes* J.L. Barnard, 1967a, to *Cedrosella*.

**Species.** See De Broyer (1977); *A. brevipes* Ledoyer, 1986 [618A]; *A. georgiensis* K.H. Barnard, 1931a, 1932 (De Broyer, 1977b) [833]; *A. tumicornis* (Nicholls, 1938) (Bellan-Santini, 1972b) [870+B]; *A. uncinata* K.H. Barnard, 1932 (De Broyer, 1977b) [870B].

**Habitat and distribution.** Marine, mostly Antarctic and South Georgia, near Madagascar, 5-2500 m, 4 species.

**Anonyx** Kröyer

Figs 89U, 90O, 93I


**Type species.** *Lysianassa lagena* Kröyer, 1838b, selected by Boeck, 1876.

**Diagnosis.** Mouthparts forming quadrate bundle. Labrum and epistome produced, prominent, separate, either dominant in size and projection, blunt. Incisor ordinary, molar simple, large, conicolaminate or subconical, setulose, palp attached slightly distal to or opposite molar. Inner plate of maxilla 1 weakly (2) setose; palp 2-articulate, large. Inner poorly and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl well developed. Coxa 1 large and visible, not tapering. Gnathopod 1 subchelate, palm transverse, article 5 usually shorter than 6, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely subchelate. Inner ramus of uropod 2 often with notch (adults). Uropod 3 almost aequiramous, ordinary, peduncle ordinary, inner ramus slightly shortened, outer ramus 2-articulate. Telson ordinary, deeply cleft.

**Additional character.** Gills often plaited.

**Sexual dimorphism.** Male antennae 1-2 more strongly armed, flagellum of antenna 2 elongate and proliferate, calceoli often present; eyes enlarged; notch on inner ramus of uropod 2 occasionally reduced; rami of uropod 3 slightly enlarged and more strongly setose.

**Variables.** Article 1 on primary flagellum of antenna 1 scarcely elongate (*A. sculptifer*); accessory flagellum reduced to 2 articles (*A. minimus*); epistome produced (*A.
epistomicus, etc.); spines on outer plate of maxilla 1 oddly shaped and positioned, or reduced in number (A. minimus, A. oculatus, etc.); articles 5 and 6 subequally long (A. lilljeborgi, A. bispinosus); palm of gnathopod 1 very short (A. compactus, A. simplex); propodus of gnathopod 2 especially broadened and palm deeply excavate (A. debruynii, A. knipowitschi) and intermediated to normal condition by (A. orientalis, A. biruui, A. eous, etc.); rami of uropods 1-2 aspinose (A. minimus); inner ramus of uropod 2 with notch reduced (A. laticoxae, etc.).

Relationship. Differing from Hippomedon in the larger head, weaker mandibular molar, pleated gills, and usually with the carpus shorter than the propodus on gnathopod 1. From Koroga in the small propodus of gnathopod 1, small head, and deeply cleft telson. From Boeckosimus (= 'Onisimus') and Onisimus (= Pseudalibrotus) in the cleft telson. From Paronesimus in the pleated gills.

Fig. 91. Lysianassidae. A, Perrierella audouiniiana; B, Acidostoma obesum; C, Orchiomene batei; D, Scopelocheirus crenatus; E, Adeliella laticornis; F, Lysianassa plumosa; G, Argella heterodonta; H, Trischizostoma nicaeense; I, Pachyurus elatum; J, Kerguelenia borealis; K, Nannonyx goesi; L, Danaella mimoneutes; M, Ichnopus spincornis; N, Ambassia atlantica; O, Normanjon sarst; P, Cestromedon pumilus; Q, Paracyphocaris praedator; R, Scopelocheiris abyssalis; S, Endeovoua mirabilis.
See Cicadosa, Pseudoanonyx, Tmetonyx and Tryphosoides.


Habitat and distribution. Marine, coldwater northern Hemisphere, 0-3000 m (mostly to 300 m), common as skeletoniser in traps and boxes, occasionally as inquiline in clams, 45 species.

Aristias Boeck

Figs 90F, 92X, 95I


Type species. Anonyx tumidus Kroyer, 1846b, monotypy.

Diagnosis. Mouthparts forming quadrable bundle. Labrum and epistome continuous, coalesced, projection sharp. Incisor ordinary, molar simple, large, conicolamate, or subconical, setulose, palp attached opposite molar. Inner plate of maxilla 1 strongly (3-5) setose medially; palp 2-articulate, large. Plates of maxilla 2 divergent, inner strongly setose medially. Inner poorly and outer plates of maxilliped well developed, outer plate poorly armed; palp strongly exceeding outer plate, dactyl well developed. Coxa 1 strongly shortened and partly covered by coxa 2. Gnathopod 1 short, strongly subchelate (in type), simple in other species, palm transverse, articles 5 and 6 subequal, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 with small notch(es) bearing spine(s). Uropod 3 quaquiramous, ordinary, peduncle ordinary, outer ramus 2-articulate. Telson short to ordinary, deeply cleft.

Variables. Eyes present or absent; accessory flagellum 2-articulate and shorter than article 1 of primary flagellum (A. microps, A. megalops); prebuccal margin with notch, elements blunt (A. expers); same but upper lip subsharp (A. colinus); gnathopod 1 almost simple (A. madagascarensis, A. neglectus); gnathopod 2 not chelate, only subchelate (A. falcatus, etc.); peduncle of uropods 1-3 expanded and plate-like (A. madagascarensis); inner ramus of uropod 3 shortened (A. megalops, A. microps).
**Relationship.** Differing from *Eurythenes* by the shorter telson, broader inner plate of maxilla 2, narrower mandibular molar, and longer article 2 of pereopod 5. From *Tryphosella* in the medially setose maxillae 1-2. From *Centromedon* and *Ambasia* in the well-developed dactyl of the maxilliped. From *Paralicella* in the non-elongate article 3 of gnathopod 1. See *Perrierella*.

**Species.** See Gurjanova, 1951, 1962; Stephensen, 1935a, 1944a; *A. adrogens* J.L. Barnard, 1964e [228B]; *A. antarcticus* Walker, 1906b, 1907 (Schellenberg, 1926a, coasi).
Habitat and distribution. Marine, cosmopolitan, rarely warm shallows, associated with sponges and brachiopods (Vader, 1986a,b). Habitat not reported for Aroui.

Diagnosis. Of scopelocheirin form. Mouthparts forming quadrate bundle. Labrum and epistome not differentially produced, separate, epistome dominant in size, with notch above labrum. Incisor ordinary, molar triturative, small; palp attached slightly proximal to molar. Inner plate of maxilla 1 strongly setose; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl well developed. Coxa 1 large and visible, expanded apically. Gnathopod 1 poorly subchelate, palm almost transverse, articles 5 and 6 subequal, dactyl vestigial, shrouded in setae; article 6 of gnathopod 2 slightly longer than article 5, propodus minutely subchelate (versus Paracallisoma). Inner ramus of uropod 2 without notch. Uropod 3 ordinary, peduncle ordinary, inner ramus slightly shortened, outer ramus 2-articulate. Telson elongate, deeply cleft.

Additional characters. Epistome flat anteriorly (versus Scopelocheirus); outer plate of maxilla 1 with thick plumose apical seta besides articulated spines; plates of maxilla 2 broad, outer shortened but much broader than inner plate, some setae awned or hooked; ventral margins of coxae 1-4 very densely setose. See Scopelocheirus.

Relationship. See ‘Additional characters’. Differing from Bathycallisoma in the lack of medial gap on the lower lip. From Paracallisoma, Paracallisomopsis, and Eucallisoma in the chelate gnathopod 2. From Scopelocheiropsis in the well-developed maxillipedal dactyl.

Species. Aroui setosus Chevreux, 1911d, original designation.

Aroui Chevreux, 1911d: 169.

Type species. Aroui setosus Chevreux, 1911d, original designation.

Aristiopsis J.L. Barnard


Type species. Aristiopsis tacitus J.L. Barnard, 1961a, original designation.

Diagnosis. Mouthparts forming quadrate bundle. Labrum and epistome almost continuous, each part with weak blunt projection. Incisor ordinary, molar triturative, medium, palp attached slightly proximal to molar. Inner plate of maxilla 1 weakly (2) setose; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl well developed. Coxa 1 strongly shortened and partly covered by coxa 2. Gnathopod 1 strongly subchelate, palm transverse, parachelate, article 5 shorter than 6, dactyl large; article 6 of gnathopod 2 slightly to greatly shorter than article 5, ordinary, propodus minutely subchelate. Inner ramus of uropod 2 with large notch. Uropod 3 ordinary, peduncle elongate, inner ramus slightly shortened, outer ramus 2-articulate. Telson ordinary, weakly cleft.

Sexual dimorphism. [Unknown].

Relationship. Differing from Aristias in the ordinary maxilla 2, ridged molar and form of inner plate on maxilla 1. From Ambiastylia in the narrow article 2 of the maxillipedal palp. From Schistiurella in the non-dominance of the upper lip in lateral aspect, lack of medial setae on the inner plate of maxilla 2 and the presence of a lobe on the coxa 2. See Coximonedon.


Habitat and distribution. Marine, Indo-Pacific, 842-3950 m, 2 species.
Habitat and distribution. Marine, Mediterranean, 34-65 m, 1 species.

*Aruga* Holmes

*Aruga* Holmes, 1908: 504.

Type species. *Aruga oculata* Holmes, 1908, original designation.

Diagnosis. Mouthparts forming quadrate bundle. Labrum and epistome differentially produced, prominent, separate, labrum strongly dominant in size and projection, bluish. Incisor ordinary, molar simple, conicalamate, subconical, setulose, palp attached strongly proximal to molar. Inner plate of maxilla 1 weakly (2) setose; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp article 2 scarcely exceeding outer plate, dactyl small. Coxa 1 large and visible, not tapering. Gnathopod 1 short, simple, articles 5 and 6 subequal, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 with large notch. Uropod 3 short, peduncle expanded, inner ramus slightly shortened, outer ramus 2-articulate. Telson ordinary, entire.

Additional character. Male antenna 2 elongate (versus *Lysianopsis*)

Sexual dimorphism. Male eyes enlarged; antenna 2 elongate, articles 4-5 expanded, with male tufts; uropod 3 setose.

Relationship. Differing from *Lysianopsis* in elongate male antenna 2.

Removal. *Aruga subantarctica* Schellenberg, 1931, to *Lysianopsis*.

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Species. **Arugella falklandica** (K.H. Barnard, 1932) (Pirlot, 1936b) [831]; **A. holmsei** J.L. Barnard, 1955b, 1979b (Hurley, 1963) [369]; **A. oculata** Holmes, 1908 (Hurley, 1963) [370 + B].

**Habitat and distribution.** Marine, east warm-temperate Pacific, Falkland Islands and Magellanica, 0-457 m, 3 species.

**Arugella** Pirlot

Figs 90T, 91G, 95R

**Moderate** to **large**. Inner plate of maxilla 2. From **inner plate of maxilla 2 much broader than outer**.

**Additional character.** Outer plate of maxilla 1 with 7 thick, large and 4 thin, small spines in 2 groups; inner plate of maxilla 2 much broader than outer.

**Relationship.** This genus and **Shoemakerella** Pirlot, 1936b (described by Pirlot on a later page, thus possible synonym) are so close as to be indistinguishable, but future study may find their distinctions; for the moment we keep them separated and assign them to the Caribbean **Shoemakerella** and Indo-Pacific **Arugella** regions with similar species separated on regional basis.

The type species of **Arugella** has a reduced dactyl of the maxilliped and the assumed (or model) type species of **Shoemakerella** has pleated gills, thus indicating other differences may be found; **Shoemakerella** may or may not lack the extra small inner spines seen in **Arugella** on the outer plate of maxilla 1 but this is unconfirmed.


**Habitat and distribution.** Marine, Indo-Pacific from Hawaii to Madagascar; also at Channel Islands, English Channel, 4-160 m, 5 species.

**Azotostoma** J.L. Barnard

**Species.** **Azotostoma fusta** J.L. Barnard, 1965a

**Type species.** **Azotostoma fusta** J.L. Barnard, 1965a, original designation.

**Diagnosis.** Of conicostomin form. Mouthparts forming conical bundle, styliform. Labrum and epistome (continuous, not differentially produced, prominent, coalesced, separate, labrum epistome slightly strongly dominant in size, projection blunt, sharp). Incisor ordinary, smooth, molar absent; palp attached strongly proximal on mandible. Inner plate of maxilla 1 weakly setose apically; palp 2-articulate, large, geniculate apically. Inner poorly and outer plates of maxilliped well developed, palp scarcely exceeding outer plate, article 2 produced, article 3 attached to 2 in geniculate fashion, dactyl well developed. Cox 1 large and visible, not tapering. Gnathopod 1 short, simple, article 6 longer than 5, dactyl long; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 with large notch. Uropod 3 short, peduncle short, expanded, inner ramus slightly shortened, outer ramus 1-articulate. Telson ordinary, entire.

**Additional character.** Pair of maxilla 2 formed so as to enclose imaginary hemispherical channel, inner plate medially expanded, pubescent, with only 3 apical spines, outer plate much more slender. See description of maxilla 1 and maxillipeds.

**Relationship.** This genus belongs with the **Acidostoma-Trischizostoma** group bearing styliform mouthparts formed into a conical bundle; differing from **Stomacontion** and **Acontiostoma** in the biramous uropod 3; from **Phoxostoma** in the well-developed dactyl of the maxillipedal palp; from **Trischizostoma** in the simple, flagellate gnathopod 1; from **Acidostoma** by the large palp of maxilla 1; from **Shackletonia**, a close analogue, by the unequal telson.

**Species.** **Azotostoma fusta** J.L. Barnard, 1965a (Ledoyer, 1986) [591, 698].

**Habitat and distribution.** Marine, Ifaluk (Ifalik)
Atoll, Caroline Islands, Madagascar, littoral-10 m, 1 species.

**Bathyamaryllis** Pirlot

Figs 90W, 94E

*Bathyamaryllis* Pirlot, 1933a: 123.

Not Vijaya Walker, 1904 (which see).

**Type species.** *Bathyamaryllis perezi* Pirlot, 1933a, original designation.

**Diagnosis.** Of cyphocarin form, head weakly grotesque or strongly so, rostrum large; coxae 1-2 shortened and partly covered by coxa 3, larger than 1, coxa 1 subrectangular or subquadrate, coxae 3-4 long, coxa 5-7 short. Mouthparts forming quadrate bundle. Labrum and epistome continuous, not differentially produced, not prominent, coalesced, not strongly projecting, blunt. Incisor ordinary, molar simple, large to short, subchelate, palm oblique, articles 5 and 6 subequal or either shorter than other, dactyl well developed; small. Gnathopod 1 short, simple, articles 5 and 6 subequal or either shorter than other, dactyl small, occasionally shrouded in setae; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 with large notch. Uropod 3 acquiserrate, ordinary, peduncle elongate, outer ramus 1-articulate. Telson ordinary to elongate, deeply cleft.

**Additional characters.** Rostrum well marked (versus *Amaryllis*); article 2 of antenna 1 elongate (versus *Amaryllis*), primary flagellum of antenna without calyptophore, accessory flagellum elongate; antenna 2 long and thin; article 5 of antenna 2 much shorter than article 4; palp of maxilla 1 absent.

**Variables.** Head deformed, bevelled ventrally (*B. conocephala*); article 2 of antenna 1 shorter than article 1 (*B. haswelli*), longer than article 1 (*B. perezi*), article 1 with long apical tooth (*B. haswelli*); dactyl of maxilliped reduced (*B. conocephala*); coxa 2 larger than coxa 1 (type), not (*B. conocephala*); carpus of gnathopod 1 longer than propodus (*B. conocephala*); outer ramus of uropod 2 shortened (*B. haswelli*); cleft of telson only one third (*B. haswelli* of Chevreux, 1935).

**Relationship.** Like *Amaryllis* but rostrum well marked and article 2 of antenna 1 elongate.

Differing from *Propychophocaris* in the elongate article 2 of antenna 1, the large rostrum, smaller molar and incised inner ramus of uropod 2. From *Cycloecaris* in the better defined and lobate head, elongate article 2 of antenna 1, weakly setose maxillae 1-2 medially, and in the short article 3 of gnathopod 1.

**Species.** *Bathyamaryllis conocephala* (K.H. Barnard, 1926) (Griffiths, 1977b) [701B]; *B. haswelli* (Stebbing, 1888) (= *B. pulchellus* Bonnier, 1890; Stephensen, 1923b) (Chevreux, 1927, 1935) [355B]; *B. perezi* Pirlot, 1933a [640B + 1]; *B. rostrata* Chevreux, 1911a, 1935 [303A].

**Habitat and distribution.** Marine, probably cosmopolitan, mostly deep bathyal, 120-2320 m, 4 species.

**Boeckosimus** J.L. Barnard

(= *Onisimus* Boeck, auct.)

Figs 86A, 90P, 95N,T

**Type species.** *Anonyx edwardsii* Krøyer, 1846b, original designation.

**Diagnosis.** Mouthparts forming quadrate bundle. Labrum and epistome not differentially produced, separate, blunt. Incisor ordinary, molar triturative, large, palp attached opposite molar. Inner plate of maxilla 1 weakly (2) setose; palp 2-articulate, large. Both plates of maxilla 2 with apicominal setae (apices oblique). Inner and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl well developed. Coxa 1 large and visible, not tapering. Gnathopod 1 short, subchelate, palm oblique, articles 5 and 6 subequal or 5 shorter than 6, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 with large notch. Uropod 3 ordinary, peduncle ordinary, inner ramus slightly shortened, outer ramus 2-articulate. Telson short, weakly cleft (type).

**Variables.** Article 1 on primary flagellum of antenna 1 long (*B. normani*) short (type); eyes absent (*B. sextoni*, etc.); outer ramus of uropod 3 lacking article 2 (*B. derjugini*); palm of gnathopod 2 not chelate, = oblique (*B. iurgidus*); molar poorly triturative (*B. dabbii*).

**Relationship.** See *Onisimus* (= *Pseudalibrotus*). See J.L. Barnard (1969c: 331) showing various quotes in literature: Sars (1895) distinguishing *Onisimus* (= *Pseudalibrotus*) from *Boeckosimus* on more powerful gnathopod 1 and uropod 3 and longer antennae; Gurjanova (1962) distinguishing them on absence of bent spines on apices of outer plates on maxillipeds; most species of *Boeckosimus* with slightly cleft telsons and lack of epistomal dominance in prebuccal complex.

**Species.** See Bruggen (1909); Gurjanova (1951, 1962);
Fig. 94. Lysianassidae. A, Acidostoma obesum; B, Centromedon pumilus; C, Tryphosella sarsi; D, Normanion sarsi; E, Bathynomysis perezi; F, Chevreuxiella metopoides; G, Danaella mimonectes; H, Thoriella islandica; I, Lysianella petalocera.

+ 218B]; B. normani (Sars, 1895) (Shoemaker, 1930b) (Vader, 1967) [200 + B]; B. platias (Kroyer, 1845, 1846a,b) (Sars, 1895) (Schellenberg, 1927) (Shoemaker, 1930b) (Dunbar, 1954) [200 + B]; B. punctatus (Baier, 1862) (Stebbing, 1906) [267]; B. sextoni (ae) (Chevreux, 1926a, 1935) (Stephensen, 1935a) [218B]; B. sibiricus (Bruggen, 1909) (Gurjanova, 1962) [220, especially 292]; B. simus (Gurjanova, 1962) [284]; B. turgidus (Sars, 1879, 1885, 1886) (Gurjanova, 1951) [220ABI]; B. vorax (Stuxberg, 1880, nomen nudum); [B. zebra (Stuxberg, 1880, nomen nudum)].

Habitat and distribution. Marine, arctic, weakly boreal, 0-3220 m, occasionally inquilinous on actinians, 17 species.

Bonassa n.gen.

Type species. Lysianassa bonairensis Stephensen, 1933d, original designation.

Etymology. Named for the type species.

Diagnosis. Mouthparts forming quadrate bundle. Labrum and epistome both produced, prominent, separate, blunt. Incisor ordinary, molar simple, small; palp attached strongly proximal to molar. Inner plate of maxilla 1 weakly setose; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp slightly exceeding outer plate, dactyl small. Coxa 1 large and visible, not tapering. Gnathopod 1 short, simple, articles 5 and 6 subequal, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 without notch. Uropod 3 almost acquiramous, ordinary, peduncle elongate, outer ramus 1-articulate. Telson ordinary, entire.

Additional characters. Antenna 1 with teeth; maxilla 1 outer plate with at least 7 spines; outer plate of maxilla 2 broadest; uropods 1-2 setose; gills pleated.

Sexual dimorphism. Male antenna 2 elongate and calceoliferous.

Relationship. Differing from Phoxostoma in the nonconical mouthpart field, the produced epistome, broad non-geniculate outer plate of maxilla 2, and the presence of a tooth on article 2 of antenna 1. From Socarnella in the acquiramous uropods 1-2.

Species. Bonassa bonairensis (Stephensen, 1933d, 1947b) [462J].

Habitat and distribution. Anchialine, Bonaire, in small cistern 1-10‰ salinity, 1 species.

Bruunosa Barnard & Karaman


Fig.95. Lysianassidae. A, Tryphosites longipes; B, Gronella groenlandica; C, Lysianopsis alba; D, Hippomedon denticulatus; E, Lysianassa plumosa; F, Nannonyx goesi; G, Acontiostoma marionis; H, Glycerina tenuicornis; I, Aristias tumida; J, Lepidepcicrella ctenophora; K, Stomacontion pepini; L, Daniella mimonectes; M, Paratryphosites abyssalis; N, Boeckosimus edwardsi; O, Opisa eschrichti; P, Ichnopus spinicorlis; Q, Eurythenes gryllus; R, Aragella heterodonta; S, Acidostoma obesum; T, Boeckosimus normani; U, Trischizostoma nicaeense; V, Orchomene batei.
Type species. *Tryphosa bruuni* Dahl, 1959, original designation.

Diagnosis. Mouthparts forming quadrate bundle. Labrum and epistome differentially produced, not prominent, separate, labrum slightly dominant in size and projection, blunt. Incisor ordinary, molar triturative, large, palp attached opposite molar. Inner plate of maxilla 1 weakly (2) setose; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp slightly exceeding outer plate, dactyl well developed. Coxa 1 large and visible, slightly tapering or rounded below. Gnathopod 1 short, subchelate, palm oblique, article 5 slightly longer than 6, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus subchelate, dactyl thick and stubby. Inner ramus of uropod 2 with large notch. Uropod 3 ordinary, peduncle elongate, inner ramus strongly shortened, outer ramus 2-articulate. Telson elongate, deeply cleft.

Additional characters. Article 1 of accessory flagellum elongate and flattened; outer plate of maxilla 2 much broader than inner; outer plate of maxilliped with large articulate spines (versus *Cicadosa* and *Anonyx*); coxa 4 posteroventral lobe weak and blunt (versus *Anonyx* and *Cicadosa*); dactyl of gnathopod 2 especially thick; telson with dorsal spines but none terminal.

Relationship. Differing from *Cicadosa* in the large articulate spines on outer plate of maxilliped, subchelate gnathopod 1, and slightly rounded, not expanded coxa 1. From *Anonyx* in large spines on outer plate of maxilliped, slightly rounded, not expanded coxa 1, incised inner ramus of uropod 2, and dorsal spines on telson. From *Tryphosella* in triturative molar, slightly dominant labrum, and dorsal, not terminal, telsonic spines. From *Ambasiospis*, *Cedrosella*, *Galathella*, and *Schisturella* in non-reduced coxa 1, and from the middle two genera in the incised inner ramus of uropod 2.

Species. *Bruunosa bruuni* (Dahl, 1959) [714A].

Habitat and distribution. Marine, Kermadec Trench, 6660-6770 m, 1 species.

*Caeconyx* n.gen.

Type species. *Hoplonyx caeculus* Sars, 1895, original designation.

Etymology. Combination of roots in *Hoplonyx* and *caeculus*.

Diagnosis. Mouthparts forming quadrate bundle. Labrum and epistome not differentially produced, separate. Following parts unknown: [?] Incisor ordinary, widely minutely toothed, molar weakly triturative, simple, large, small; obsolescent; absent; conicolaminate, subcumical, setulose, smooth; palp attached strongly slightly distal proximal to opposite molar. Inner plate of maxilla 1 strongly moderately weakly (1) setose; palp 1 2-articulate, large. small. absent. Inner poorly and outer plates of maxilliped strongly poorly developed, palp scarcely slightly strongly exceeding outer plate, dactyl well developed. small. vestigial. absent). Coxa 1 large and visible, not tapering. Gnathopod 1 short, strongly subchelate, palm oblique, propodus rectangular, articles 5 and 6 subequal, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary; propodus minutely subchelate. Inner ramus of uropod 2 without notch. Uropod 3 ordinary, peduncle ordinary, inner ramus slightly shortened, outer ramus 2-articulate. Telson elongate, deeply cleft.

Additional characters. Head larger than in *Hippomedon* but smaller than in *Orchomene*. Article 1 of primary flagellum of antenna 1 nearly as long as peduncular article 1 in male, accessory flagellum longer.

Relationship. Differing from *Tmetonyx* in the sharp ocular lobe, the short article 3 of gnathopod 1, and the equally extending rami of uropod 3 with article 2 on the outer ramus being longer. From *Hippomedon* in the large head and rectangular propodus of gnathopod 1 with well-developed palm. Differing from *Orchomene* in the elongate, nonlobate carpus of gnathopod 1. Differing from *Pseudorchomene* in the short article 3 of gnathopod 1.

Species. *Caeconyx caecula* (Sars, 1895) (was *Tmetonyx*) (Stephensen, 1935d) (Gurjanova, 1951) [240B].

Habitat and distribution. Marine, Iceland to Trondheim fjord, 150-660 m, 1 species.

*Cebocaris* J.L. Barnard


Type species. *Cebocaris grutesca* J.L. Barnard, 1964a, original designation.

Diagnosis. Of cyphocarin form, head tall, horizontally short, grotesque, flagella of antennae short (1) or vestigial (2), accessory flagellum 1-articulate, vestigial. Mouthparts forming quadrate bundle. Labrum and epistome continuous, not differentially produced, coalesced, epistome dominant in size. Incisor ordinary, rakers present; molar absent; palp attached slightly proximal to middle. Inner plate of maxilla 1 weakly (1) setose; palp 2-articulate, large. Plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl...
well developed. All coxae short but coxae 1-2 together slightly shorter than coxae 3-4, only coxa 2 slightly covered by coxa 3, coxa 4 scarcely excavate posteriorly, coxa 5 largest. Gnathopod 1 short, simple, articles 5 and 6 subequal, dactyl large; article 6 of gnathopod 2 slightly shorter than article 5, linear, simple, article 7 tiny, somewhat concealed by setae. Uropod 3 ordinary in size, parviramous, peduncle ordinary, inner ramus slightly shortened, outer ramus (1-2-articulate). Telson ordinary, entire.

Additional characters. Pereopods 3-5 [*6,7] prehensile or subchelate, propodi thickened and spiny; article 2 of pereopods 5-7 poorly expanded but weakly lobate.

Relationship. Cebocaris is characterised by the rectangular but slightly expanded article 2 of pereopods 5-7 combined with the uncleft telson.

Differing from Mesocyphocaris by the uncleft telson, the more strongly reduced accessory flagellum and flagellum of antenna 2, shorter uropod 3 with shortened inner ramus and the stouter gnathopod 1 with longer dactyl.

See Crybelocephalus.

Species. Cebocaris grutesca J.L. Barnard, 1964a [404A].

Habitat and distribution. Marine, north of Puerto Rico Trench, '5419-5451' m, 1 species.

Cedrosella Barnard & Karaman


Type species. Ambasiopsis (?) fomes J.L. Barnard, 1967a, original designation.

Diagnosis. Mouthparts forming quadrate bundle. Labrum and epistome differentially produced, not prominent, separate, labrum slightly dominant in size and projection, blunt. Incisor ordinary, molar weakly triturative, large, also setulose, palp attached opposite molar. Inner plate of maxilla 1 weakly (2) setose; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl well developed. Coxa 1 strongly shortened and partly covered by coxa 2, tapering. Gnathopod 1 short, strongly subchelate, palm transverse, article 5 shorter than 6, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 without notch. Uropod 3 ordinary, peduncle ordinary, inner ramus slightly shortened, outer ramus 2-articulate. Telson ordinary, short, deeply cleft.

Additional characters. Head lacking sinus for antenna 2; antennae very short; basalmost inner seta of maxilla 2 largest; apex of outer plate on maxilliped with 2 thick spines; dactyl of gnathopod 1 lacking inner tooth; pereopods 5-7 very short.

Relationship. Differing from Ambasiopsis in lack of carina on article 1 of peduncle on antenna 1; D-setae occupying less than half of mandibular palp article 3 (but also true of Ambasiopsis tumicornis); 10 spines on outer plate of maxilla 1; apex of outer plate on maxilliped with strong apical spines (but also weakly true in Ambasiopsis tumicornis); article 5 of gnathopod 1 shorter than article 6, dactyl without inner tooth, palm transverse; no process on urosomite 1.

From Ventiella in deeply cleft telson; different molar, not distally ridged, less than half of palp article 3 edge with D-setae; inner plate of maxilliped broader, with smaller, well-distributed apical spines, no lateral acclivities; narrowing palpa of maxilla 1, with few larger teeth and spines; 2 locking spines on pereopods 3-7; very short articles 3-7 on pereopods 5-7; longer carpus of gnathopod 1; weak uropods 1-2; short antennae 1-2; and no process on urosomite 1.

From Schisturella in lack of notch on inner ramus of uropod 2, small antennae, weaker molar, small head with sinus for antenna 2 and short pereopods 5-7. From Galathella in the slightly reduced and setulose molar and narrow serrate apex of the palp on maxilla 1 (versus broad and with bead-like spines).

Species. Cedrosella fomes (J.L. Barnard, 1967a) [309A].

Habitat and distribution. Marine, Cedros Trench, Pacific Mexico, 3705-3745 m, 1 species.

Centromedon Sars

Figs 90A, 91P, 94B


Type species. Anonyx pumilus Liljeborg, 1865a, original designation.

Diagnosis. Mouthparts forming quadrate bundle. Labrum and epistome differentially produced, prominent, separate, labrum strongly dominant in projection, blunt. Incisor ordinary, molar simple, large, subconical, setulose; palp attached opposite molar. Inner plate of maxilla 1 weakly (2) setose; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl small, vestigial. Coxa 1 slightly shortened and partly covered by coxa 2, tapering. Gnathopod 1 short, nearly simple, palm oblique, articles 5 and 6 subequal, dactyl large, article 6 of gnathopod 2 greatly shorter than article 5, both elongate, propodus minutely subchelate, article 7 short.
Inner ramus of uropod 2 without notch. Uropod 3 ordinary, peduncle ordinary, inner ramus slightly shortened, outer ramus 2-articulate. Telson elongate, deeply cleft.

**Variables.** Inner plate of maxilla 1 with 1 seta (C. pavor); gnathopod 2 stout (C. pavor); dactyls of pereopods 3-4 elongate (C. pavor).

**Relationship.** Characterised by the reduced maxillipedal palp but differing from *Menigratopsis* in the slightly subchelate gnathopod 1, broader coxa 1 with less taper and the poorly developed dactyl of the maxilliped. Differing from *Pseudoanonyx* in the sloping palm of gnathopod 1, tapering coxa 1 and smaller dactyl of the maxilliped (in *Pseudoanonyx* it is tumid). Otherwise close to *Anonyx*, *Hippomedon*, *Boeckosimus*, *Paronesimus*, *Tmetonyx*, and similar genera.

**Species.** See Stephensen (1935a, 1944a); Olerod (1980, all species); C. calcareus (Sars, 1879, 1885) (Stephensen, 1935a) [210 + BA]; C. pavor J.L. Barnard, 1966b, 1971b [270]; C. productus (Goes, 1886) (= C. rusanovi Gurjanova, 1933b, 1951, Bryazgin, 1974a) [210 + B]; C. pumilus (Liljeborg, 1865a) (Sars, 1895) (Gurjanova, 1951) [210 + B]; C. typphlops (Sars, 1879, 1885) (= C. caecus Vosseler, 1889, but = *Lysianassa martensis* by Olerod 1980, now see *Martensisia*) (Gurjanova, 1951) [210BA].

**Habitat and distribution.** Marine, arctic, boreal, submerging to cold water in lower latitudes, 4-3699 m, 5 species.

*Cheirimedon* Stebbing

**Type species.** *Cheirimedon crenatipalmatus* Stebbing, 1888, monotypy.

**Diagnosis.** Mouthparts forming quadrate bundle. Labrum and epistome [type unknown], differentially produced, not prominent, labrum slightly dominant in projection and blunt. Incisor ordinary, molar triturative, large, palp attached opposite molar. Inner plate of maxilla 1 weakly (2) setose; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl well developed. Coxa 1 large and visible, not tapering. Gnathopod 1 slightly to strongly enlarged, subchelate, palm oblique or transverse, article 5 much shorter than 6 and weakly lobate, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus subchelate. Inner ramus of uropod 2 without notch. Uropod 3 ordinary, peduncle ordinary, inner ramus slightly to slightly shortened, outer ramus 2-articulate. Telson elongate, deeply to weakly cleft.

**Variables.** Ocular lobe of head blunt (*C. fougnieri, C. similis*); article 1 of primary flagellum on antenna 1 elongate (type), short in female (*C. fougnieri*); molar occasionally poorly ridged and sublaminate; dactyl of maxilliped lacking nails (*C. fougnieri, C. similis*); article 6 of gnathopod 1 well expanded (type), poorly so in most other species, occasionally slightly chelate; accessory coxal gill on coxae 5-6 (*C. femoratus*, K.H. Barnard, 1932); rami of uropods 1-2 especially short (*C. fougnieri, C. similis*); cleft of telson reduced (*C. fougnieri*).

**Relationship.** Characterised by the very short and lobate carpus of gnathopod 1. Like *Orchomene* but mandibular palp opposite molar. Differing from *Anonyx* in the unpleated gills, smaller molar and slightly to greatly expanded article 6 of gnathopod 1. From *Boeckosimus* and *Onisimus* (= *Pseudalibrotus*) in the deeply cleft telson. From *Schisturella* in the short carpus of gnathopod 1 and the unexpanded coxa 1. From *Tryphosella* in the nontapering coxa 1, and on gnathopod 1 the short and lobate carpus and slightly expanded propodus. From *Uristes* and *Pseudotryphosa* in the unexpanded coxa 1.

**Removals.** *Cheirimedon laitimanus* Sars, 1883, to *Coximelon*; *C. pectinipalma* K.H. Barnard, 1926, to *Coximelon*.

**Species.** See K.H. Barnard, 1932; Bellan-Santini, 1972a; Bellan-Santini & Ledoyer, 1974; Stephensen, 1938c; *C. crenatipalmatus* Stebbing, 1888 (Schellenberg, 1926a) (= *C. hansonii* Walker, 1903, 1907) [870]; *C. femoratus* (Pfeffer, 1888) (= *C. dentimanus* Chevreux, 1905d, 1906c, 1912d) (Bellan-Santini, 1972a) (Bellan-Santini & Ledoyer, 1974) (Thurston, 1974a) (Andres, 1983) [870 + B]; *C. fougnieri* Walker, 1903 (Bellan-Santini, 1972a) (Thurston, 1974a) [870]; *C. similis* Thurston, 1974a [870 + B]; *C. solidus* Andres, 1986 (= *C. similis* identification of Andres, 1983) [870].

**Habitat and distribution.** Marine, dominantly Antarctic, 0-385 m, 5 species.

*Chevreuxiella* Stephensen

**Type species.** *Chevreuxiella metopoides* Stephensen, 1915, monotypy.
Diagnosis. Of cyphocarin proportions, thus head slightly grotesque: coxae 1-2 small and partly covered by coxa 3. Mouthparts forming quadrate bundle, but mostly reduced and styliform. Labrum and epistome continuous, prominent, coalesced, epistomal part slightly dominant in projection, blunt. Incisor ordinary, molar absent; palp absent. Inner plate of maxilla 1 moderately (4+)+ setose; palp 2-articulate, large. Inner and outer plates of maxilliped poorly developed, palp strongly exceeding outer plate, dactyl absent, palp debatable (see ‘Additional characters’). Coxa 4 largest but coxae 5-6 also very large and as long as coxa 4. Gnathopod 1 short, simple, article 5 longer than 6, dactyl small, weakly shrouded in setae; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus simple. Inner ramus of uropod 2 without notch. Uropod 3 absent. Telson absent.

Additional characters. Head subglobular, rostrum absent, ventral margin poorly defined; article 1 of primary flagellum on male antenna 1 elongate and swollen, thus more massive than peduncle; flagella of antennae 1-2 with articles bead-like; accessory flagellum absent; rakers absent; outer plate of maxilla 1 with 5 spines; article 1 of palp on maxilla 1 elongate; outer plate of maxilla 2 thin, inner plate broad; maxilliped said to be composed of 2 thin subconical plates with palp composed of huge article 1 and tiny subtended article 2 (our interpretation is inner plate small and thin, outer plate huge, subtended piece = 1-articulate palp); coxa 4 adze-shaped, not excavate posteriorly, coxae 5 and 6 large, extending down as far as coxa 4 and broadly lobular, coxa 7 larger than coxae 1-2; article 2 of gnathopod 1 swollen; pereopods 3-7 weakly prehensile; urosome depressed and broadened, 2-segmented, uropod 3 and telson absent; inner rami of uropods 1-2 very short.

Variables. Body very swollen dorsally (C. obensis); palp of maxilliped with article 2 absent (C. obensis); coxa 7 very small (C. obensis); setae of gnathopod 1 reduced to 1 present on article 6 apex (C. obensis); inner rami of uropods 1-2 reduced to a spine (C. obensis).

Relationship. Differing from Mesocyclocaris especially, and all other cyphocarins, in the loss of urosomite 3, uropod 3 and telson.

Differing from Thoriella in the loss of uropod 3 and telson.


Habitat and distribution. Marine, North Atlantic and Antarctica, bathyal and abyssal, probably pelagic, 1000-4000 m, 2 species.

Cicadosa Barnard & Karaman


Type species. Anonyx cicadoides Stebbing, 1888, original designation.

Diagnosis. Mouthparts forming quadrate bundle. Labrum and epistome separate, differentially produced, labrum slightly dominant in size and projection, subsharp. Incisor ordinary, molar simple, large, weakly concomitantly, subconical, setulose; palp attached strongly distal to molar. Inner plate of maxilla 1 weakly (2) setose; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl well developed. Coxa 1 large and visible, not tapering. Gnathopod 1 simple or poorly subchelate, palm oblique, article 5 shorter than 6, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely subchelate. Inner ramus of uropod 2 with large notch. Uropod 3 ordinary, peduncle slightly elongate, inner ramus slightly shortened, outer ramus 2-articulate. Telson elongate, deeply cleft.

Sexual dimorphism. Male antennae 1-2 calceolate, flagellum of antenna 2 elongate, peduncle with anterior male tufts.

Relationship. Differing from Anonyx in the simple gnathopod 1, slightly elongate article 3 of gnathopod 1 and the slightly shorter palp of the maxilliped. From Tryphosella in the expanded coxa 1 and notched inner ramus of uropod 2. From Tmetonyx in the notched inner ramus of uropod 2 and weakness of elongation on article 3 of gnathopod 1. From Tryphosites in the dominant labrum.

See Bruunosa.

Species. Cicadosa cicadoides (Stebbing, 1888, as Anonyx) (Schellenberg, 1926a) (Bellan-Santini & Ledoyer, 1974) [851].

Habitat and distribution. Marine, Kerguelen Island, 3-228 m, 1 species.

Clepidcrella J.L. Barnard


Type species. Clepidcrella cabinda J.L. Barnard, 1962h, original description.

Diagnosis. Mouthparts forming quadrate bundle. Labrum and epistome [continuous, not differentially produced, not prominent, coalesced, blunt]. Incisor ordinary, molar simple, small to obsolescent; subconical,
setulose, palp attached opposite molar. Inner plate of maxilla 1 weakly (1) setose; palp 2-articulate, large. Inner and outer plates of maxilliped poorly developed, palp strongly exceeding outer plate, dactyl well developed. Coxal 1 large and visible, but tapering. Gnathopod 1 short, nearly simple, articles 5 and 6 subequal, dactyl large; article 6 of gnathopod 2 slightly shorter than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 without notch. Uropod 3 very short, peduncle ordinary, inner ramus strongly shortened, outer ramus 2-articulate. Telson short, emarginate.

**Additional characters.** Head 'small'; antenna 1 slightly carinate dorsally; article 2 of mandibular palp very elongate (ratio of articles 1-3 = 45:195:100); outer plate of maxilla 1 with 6 small widely spaced spines; maxilla 2 short and stubby; plates of maxilliped small, palp immense; lobe of coxa 4 huge; article 2 of pereopod 5 slender, of pereopod 7 wide and shield-like.

**Relationship.** Differing from *Acidostoma*, *Acontioestoma* and *Stomatontion* in huge palp of maxilliped. From *Onesimoides* in short basal article of primary flagellum of antenna 1 and simple gnathopod 1. From *Paronesimoides* in presence of inner ramus of uropod 3 and simple gnathopod 1.

See *Kerguelenia* (very close).

**Species.** *Cleidecreella cabinda* J.L. Barnard, 1962d [705A].

**Habitat and distribution.** Marine, Argentine Basin, 5041 m, 1 species.

**Concarnes** n.gen.

**Type species.** *Concarnes concavus* Shoemaker, 1933a.

**Etymology.** Combining roots of *Concarnes* and *concavus*.

**Diagnosis.** Mouthparts forming conical bundle. Labrum and epistome differentially produced, prominent, separate, both produced together, blunt. Incisor ordinary, molar simple, small; conicollaminate, setulose; palp attached strongly proximal to molar. Inner plate of maxilla 1 weakly (2) setose; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp [?slightly exceeding outer plate, dactyl well developed]. Coxal 1 large and visible, not tapering. Gnathopod 1 short, simple, articles 5 and 6 subequal, dactyl large; article 6 of gnathopod 2 slightly shorter than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 with large notch. Uropod 3 acquiramous, ordinary, peduncle elongate, outer ramus 2-articulate (minutely). Telson ordinary, weakly (40%) cleft.

**Additional characters.** Article 1 on primary flagellum of antenna 1 short, without callynophore; maxilliped unknown; peduncle of uropod 3 expanded and plate-like, article 2 of outer ramus vestigial; gills strongly pleated.

**Relationship.** Differing from *Socarnes* and *Socarnopsis* by incised inner ramus of uropod 2, short (less than half) cleft of telson, and plate-like peduncle of uropod 3. From *Septcarnes* in short telson with short cleft and weak article 2 on outer ramus of uropod 3. From *Aruga* and *Lysianopsis* in the significantly cleft telson and produced epistome. From *Arugella* and *Shoemakerella* in the 2-articulate outer ramus of uropod 3, cleft telson and produced epistome.

**Species.** *Concarnes concavus* Shoemaker, 1933a [478].

**Habitat and distribution.** Marine, Caribbean, Dry Tortugas, shallow, 1 species.

**Conicostoma** Lowry & Stoddart

**Conicostoma** Lowry & Stoddart, 1983a: 283, 394.

**Type species.** *Conicostoma karta* Lowry & Stoddart, 1983a, original designation.

**Diagnosis.** Of conicostomin form. Mouthparts forming conical bundle, some styliform. Labrum and epistome continuous, coalesced, blunt. Incisor ordinary, molar absent; palp attached strongly proximal. Inner plate of maxilla 1 not setose; palp 1-articulate, small. Inner poorly and outer plate of maxilliped well developed, palp not exceeding outer plate, dactyl absent. Coxal 1 large and visible, not tapering. Gnathopod 1 short, simple, article 5 [?shorter than 6], dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 without notch. Uropod 3 ordinary, peduncle ordinary, inner ramus strongly shortened, outer ramus 1-articulate. Telson ordinary, longer than broad, emarginate.

**Additional characters.** Head visible; accessory flagellum 2-articulate; rakers present; plates of maxilla 2 slender; article 4 of pereopods 5-7 strongly expanded posteriorly; inner rami of uropods 1-2 reduced.

**Relationship.** Differing from *Ocosingo* in the dactylate gnathopod 2, the well-developed biramous uropod 3 and notched telson. From *Phoxostoma* in reduced inner ramus of uropod 3, loss of molar, vestigial palp of maxilla 1, and slender plates of maxilla 2.

**Species.** *Conicostoma karta* Lowry & Stoddart, 1983a, 1984b [785].
Habitat and distribution. Marine, Australia, Kangaroo Island to Carnac Island, 4-7 m.

Coximedon n.gen.

Type species. Normania latimana Sars, 1883, original designation.

Etymology. Combination of coxa, a side-plate, and root from Hippomedon.

Diagnosis. Mouthparts forming quadrato bundle. Labrum and epistome differently produced, separate, labrum and epistome equally projecting and blunt. Incisor ordinary, molar almost simple, small; conicolaminate, setulose; palp attached opposite molar. Inner plate of maxilla 1 weakly (2) setose; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl well developed. Coxa 1 slightly shortened and partly covered by coxa 2, tapering. Gnathopod 1 strongly enlarged, strongly subchelate, palm transverse, almost chelate, article 5 much shorter than 6 and lobate, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 without notch. Uropod 3 ordinary, peduncle ordinary, inner strongly shortened, outer ramus 2-articulate. Telson elongate, deeply cleft.

Variables. Antenna 2 elongate (C. pectinipalma).

Relationship. Differing from Cheirimedon in tapering of coxa 1. From Schisturella in lack of notch on inner ramus of uropod 2 and short carpus of gnathopod 1. From Aristiopsis in absence of a notch on the inner ramus of uropod 2.

Species. Coximedon latimanus (Sars, 1883, 1895) (Stephensen, 1923b) (Gurjanova, 1951) [240B]; ?C. pectinipalma K.H. Barnard, 1926 [701B].

Habitat and distribution. Marine, arctic and South Africa, (7820 m), 1250-1505 m, 2 species.

Crybeloccephalus Tattersall

Crybeloccephalus Tattersall, 1906: 32.

Type species. Crybeloccephalus megalurus Tattersall, 1906, original designation.

Diagnosis. Of cyphocarin form, head tall, horizontally short, grotesque, or hooded. Flagella of antennae long (4-5 articulate) or reduced on antenna 2; accessory flagellum absent. Mouthparts forming quadrato bundle. Labrum and epistome [continuous, not differently produced, sinuous, prominent, coalesced, blunt]. Incisor ordinary, molar absent; palp absent. Inner plate of maxilla 1 weakly (1) setose; palp 2-articulate, large. Inner poorly and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl well developed. Coxae 1-2 small, strongly shortened and partly covered by coxa 3, coxa 4 largest, lobate, excavation weak. Gnathopod 1 short, simple, articles 5 and 6 subequal, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, propodus simple. Uropod 3 ordinary, peduncle ordinary, aquiramous, outer ramus 2-articulate. Telson ordinary, but broad basally, entire.

Additional characters. Pereopods 3-4 prehensile, hands slightly thickened and spiny, article 5 very short; article 2 of pereopod 5 unexpanded (versus Metacyphocaris), of pereopods 6-7 expanded.

Variables. Head hooded (C. birsteini); flagellum of antenna 2 2-articulate (C. barnardi); molar absent (C. crassipes); rakers present (C. birsteini); inner plate of maxilla 1 with 3 setae (C. birsteini); pereopod 5 slightly prehensile (C. birsteini); coxa 3 not expanded distally (C. obensis, etc.).

Relationship. Crybeloccephalus differs from Mesocycophocaris in the unclipped telson, lack of mandibular palp, long inner ramus of uropod 3 and the unexpanded article 2 on pereopod 5. From Cebocaris and Cyphocaroides in the loss of mandibular palp, long inner ramus of uropod 3 and diversity of article 2 on pereopods 5-7. From Metacyphocaris in the unexpanded article 2 of pereopod 5, nonprehensile pereopod 5, much shorter article 5 of pereopods 3-4, and unclipped broad telson. From Paracyphocaris in the lack of mandibular palp, unclipped telson and unexpanded article 2 of pereopod 5.


Habitat and distribution. Marine, cosmopolitan, bathy- and probably abyssopelagic, confirmed 700-1260 m, 5 species.

Crybelocyphocaris Shoemaker

Figs 87E, 89T

Crybelocyphocaris Shoemaker, 1945a: 189.
Type species. *Crybelocyphocaris tattersalli* Shoemaker, 1945a, original designation.

**Diagnosis.** Of cyphocarin form, head tall, horizontally short, grotesque. Flagella of antenna 2 short (3-articulate), accessory flagellum absent. Mouthparts forming quadrate bundle. Labrum and epistome continuous, not differentially produced. Incisor ordinary; rakers absent, molar absent; palp attached slightly proximal on body of mandible. Inner plate of maxilla 1 weakly (2) setose; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl well developed. Coxae 1-2 small, strongly shortened and partly covered by coxa 3, latter long and visible, not tapering, coxa 4 large, lobate, excavate. Gnathopod 1 long, simple, articles 3, 5, 6 elongate, articles 5 and 6 subequal, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, both very elongate and linear, propodus minutely subchelate. Uropod 3 elongate, peduncle elongate or not, inner ramus slightly shortened, outer ramus 2-articulate. Telson elongate, deeply cleft.

**Additional characters.** Note article 3 of gnathopod 1 elongate. Pereopods not distinctly prehensile, article 5 of pereopods 3-4 slightly shortened.

**Relationship.** The *Cyclocaris* group includes *Cyphocaris, Metacyclocaris* and *Mesocyphocaris* and is characterised by having more setose maxillae and better developed rakers than other cyphocarins, plus callynophore on primary flagellum on antenna 1. *Cyclocaris* is unusual in having a large mandibular molar, either vermiform or coniform. Except for *Mesocyphocaris*, a large and well-setose mandibular palp is present; the setosity is plesiomorphic in this group. *Metacyclocaris* is probably the most primitive of the group because only coxa 1 is reduced in that genus. *Cyclocaris* thus differs from *Metacyclocaris* in the further reduction of coxa 2 and the simple pereopods 3 to 4; an ancestor to these 2 genera would combine these characters. Except for *Mesocyphocaris*, the *Cyclocaris* group is also characterised by a long, though sparsely articulate, accessory flagellum, another plesiomorphic character in the group. See *Paracyphocaris* as a counter group.

Differing from *Lepidepecreella* in the strongly setose inner plate of maxilla 1 and the attachment of the mandibular palp opposite the molar.

**Species.** *Crybelocyphocaris tattersalli* Shoemaker, 1945a (Gurjanova, 1962) [307B].

**Habitat and distribution.** Marine, off Bermuda, bathypelagic, 1098 m, 1 species.

*Cyclocaris* Stebbing

*Cyclocaris* Stebbing, 1888: 664.

**Type species.** *Cyclocaris tahitensis* Stebbing, 1888, monotypy.

**Diagnosis.** Of weak cyphocarin form, head tall, horizontally short, weakly grotesque. Flagella of antennae long, base of flagellum on antenna 1 with callynophore; accessory flagellum long. Mouthparts forming quadrate bundle. Labrum and epistome separate, labrum strongly dominant in projection, blunt. Incisor ordinary, rakers present; molar large, subconical, setulose; palp attached opposite molar. Inner plate of maxilla 1 strongly (8) setose; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl well developed. Coxae 1-2 small, strongly shortened and partly covered by coxa 3, latter long and visible, not tapering, coxa 4 large, lobate, excavate. Gnathopod 1 long, simple, articles 3, 5, 6 elongate, articles 5 and 6 subequal, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, both very elongate and linear, propodus minutely subchelate. Uropod 3 elongate, peduncle elongate or not, inner ramus slightly shortened, outer ramus 2-articulate. Telson elongate, deeply cleft.

**Additional characters.** Note article 3 of gnathopod 1 elongate. Pereopods not distinctly prehensile, article 5 of pereopods 3-4 slightly shortened.

**Relationship.** The *Cyphocarioides* Birstein & Vinogradov group is also characterised by a long, though sparsely articulate, accessory flagellum, another plesiomorphic character in the group. See *Paracyphocaris* as a counter group.

**Species.** *Cyphocarioides guilemi* Chevreux, 1899b, 1935 (= *C. faeroensis* Norman, 1900a) (Sars, 1900) (Stephensens, 1933b, 1935a) (Schellenberg, 1927) (Birstein & Vinogradov, 1955, 1958) (Gurjanova, 1951, 1962) (J.L. Barnard, 1959e) [500B + 200B]; *C. tahitensis* Stebbing, 1888 (?Chevreux, 1903) (Gurjanova, 1962) [519B].

**Habitat and distribution.** Marine, probably cosmopolitan, meso-bathyal-abyssal pelagic, 200-2200 m, 2 species.

*Cyphocarioides* Birstein & Vinogradov


**Type species.** *Cyphocarioides elongatus* Birstein & Vinogradov, 1970, original designation.

**Diagnosis.** Of cyphocarin form, head tall,
horizontally short, grotesque. Flagella of antennae long, accessory flagellum vestigial, 1-articulate. Mouthparts forming quadrade bundle. Labrum and epistome continuous, not differentially produced, not prominent. Incisor ordinary, raker row present, molar absent; palp attached in middle, vestigial, 2-articulate. Inner plate of maxilla 1 weakly (2) setose; palp 2-articulate, large. Inner and outer plates of maxilliped (?strongly poorly developed, palp scarcely slightly strongly exceeding outer plate, dactyl well developed, small. vestigial. absent]. All coxae very short and broad, coxa 1 even more strongly shortened but not covered by coxa 2, coxa 4 lobate and excavate even though short. Gnatopod 1 short, simple; articles 5 and 6 subequal, dactyl large; article 6 of gnathopod 2 scarcely shorter than article 5, both elongate and linear, strongly lobate (spined) and excavate, coxa 5 usually

**Incisor ordinary,** hands thickened and spiny, article 5 short, dactyls and outer plates of maxilliped well developed. ambulate in middle, vestigial, 2-articulate. Inner plate of gnathopod 2 slightly exceeding outer plate, dactyl large; article 6 of gnathopod 2 slightly to greatly shorter than article 5, often both very elongate and linear, propodus minutely subchelate. Uropod 3 ordinary to elongate, peduncle elongate, aequiramous, outer ramus 1 or 2-articulate. Telson elongate, deeply cleft.

**Additional characters.** Note callynophore on flagellum of antenna 1; calceoli present; article 4 of antenna 2 often swollen; pereopods 3-4 (occasionally 5) prehensile, hands swollen and spiny.

**Variables.** Pereonite 1 with large spike (C. johnsoni, etc.), or hump (C. anonyx, etc.), or not (C. faurei) (see Bowman & McCain, 1967, for cyphos index); pereopods 3-4 not distinctly prehensile (C. cornuta), article 2 of pereopod 5 with large spike (C. bowieri, C. johnsoni), of pereopods 5-7 strongly toothed (C. faurei); coxa 5 much larger than coxa 4 (C. cornuta); outer ramus of uropod 3 2-articulate (C. cornuta); telson huge, almost as long as uropod 1, nearly twice as long as uropod 3 (C. johnsoni); ranging up to 40 mm in length.

**Relationship.** Cyphocaris and Pseudocyphocaris (see) are unique in the cyphocarins because coxa 3 is as small as coxae 1-2 and covered by coxa 4; in other cyphocarids coxa 3 is large, but Cyphocaris has the most plesiomorphic molar of the group. Most species of Cyphocaris are quickly recognised because they either have a hump or spike on pereonite 1 or a spike on article 2 of pereopod 5 or large teeth on article 2 of pereopods 5-7.

**See Pseudocyphocaris.**


**Habitat and distribution.** Marine, cosmopolitan,
Danaella Stephensen
Figs 88D, 91L, 94G, 95L
Danaella Stephensen, 1925b: 426.

Type species. Danaella mimonectes Stephensen, 1925b, original designation.

Diagnosis. Of cyphocarin form. Mouthparts forming globular bundle, some parts styliform. Labrum and epistome [?continuous, not prominent, coalesced, blunt]. Incisor ordinary, molar absent; palp absent. Inner plate of maxilla 1 weakly (2) setose; palp [?1 to 2-articulate], large. Inner well and outer plates of maxilliped hugely developed, palp absent. Gnathopod 1 short, simple, article 5 longer than 6, dactyl vestigial; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, latter elongate, propodus subchelate. Inner ramus of uropod 2 without notch. Uropod 3 vestigial. Telson absent.

Additional characters. Body globose, rolled into ball, peraeonites 3-6 especially inflated; head tiny, concealed by coxae; antennae thin, article 3 of antenna 1 longer than article 2, flagellum without callynophore, accessory flagellum absent; outer plate of maxilla 1 with 7-6 spines, one of these very disjunct basomedially; inner plate of maxilla 2 broader and longer than outer, weakly armed medially and apically; inner plate of maxilliped curved and tapering, outer large and helmet-shaped, both naked; coxae 3-6 very large; gnathopod 1 article 2 thick; pereopods 5-7 short, feeble, equal, article 2 narrow and linear, dactyls of pereopods 3-7 elongate, curved; uropods 1-2 with vestigial spike-like inner rami; urosomite 3 and uropod 3 vestigial; branchiae simple, sac-like.

Relationship. Differing from Chevreuxiella and Thoriella in the globose body; additionally from Chevreuxiella in the short inner ramus of uropods 1-2, the strongly overlapping coxae, and weaker setation on inner plates of maxillae 1-2.

Additionally from Chevreuxiella in lack of weak maxillipedal palp. From Mimonectes in Hyperiidea by large mid-coxae, the globosity of the body being in the middle and not anteriorly, and the thoracic sternum being hollowed out.

Species. Danaella mimonectes Stephensen, 1925b (Andres, 1983) [420B].

Habitat and distribution. Marine, Davis Strait and Antarctica, thus presumably cosmopolitan, 1900-3200 m, 1 species.

Dartenassa n.gen.

Type species. Lysianassa dartevillei Ruffo, 1953c, original designation.

Etymology. Named for roots in Lysianassa and dartevillei.

Diagnosis. Mouthparts forming quadrate bundle. Labrum and epistome differentially produced, prominent, separate, labrum strongly dominant in size, and projection, blunt. Incisor ordinary, molar simple, conicolaminate, subconical, setulose; palp attached strongly proximal to molar. Inner plate of maxilla 1 [strongly moderately weakly] setose; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl well developed. Coxa 1 large and visible, not tapering. Gnathopod 1 short, simple, articles 5 and 6 subequal, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 without notch. Uropod 3 acquiramous, ordinary, peduncle elongate, ordinary, outer ramus 1-articulate. Telson ordinary, entire.

Additional characters. Antenna 1 with tooth; outer plate of maxilla 1 with 6 and 5 spines; inner plate of maxilla 2 broadest; uropods 1-2 strongly setose.

Relationship. Differing from Phoxostoma in the non-geniculate outer plate of maxilla 2 and the tooth on article 1 of antenna 1. From Bonassa in the narrow outer plate of maxilla 2, and unproduced epistome.

Species. Dartenassa dartevillei (Ruffo, 1953b) [447].

Habitat and distribution. Marine, Zaire, Moanda, near Congo River, depth unstated, 1 species.

Derjugiana Gurjanova


Type species. Derjugiana insolita Gurjanova, 1962, original designation.

Diagnosis. Mouthparts forming conical bundle, styliform. Labrum and epistome [?continuous, not differentially produced, coalesced, blunt]. Incisor minutely toothed, molar absent; palp attached strongly proximal. Inner plate of maxilla 1 not setose; palp 2-articulate, large. Inner poorly and outer plates of maxilliped well developed, palp not exceeding outer plate, dactyl small, tumid. Coxa 1 large and visible, slightly tapering. Gnathopod 1 enlarged, strongly chelate, article 5 shorter than 6, lobate, dactyl large; article 6 of
gnathopod 2 greatly shorter than article 5, ordinary, hand minutely subchelate, article 7 vestigial. Inner ramus of uropod 2 with small notch. Uropod 3 reduced, rami absent. Telson short, entire.

'Relationship. Characterised by the vestigial uropod 3 lacking rami and the chelate gnathopod 1, with short palp of the maxilliped and styliform mouthparts arranged in a conical bundle.

Differing from Acontiostra and Stomacontion in the chelate gnathopod 1.

Species. Derjugiana insolita Gurjanova, 1962 [284].

Habitat and distribution. Marine, Sakhalin Island, 53 m, 1 species.

Dissimina_ssa n.gen.

Type species. Aruga dissimilis Stout, 1913, original designation.

Etymology. Named for roots in Lysianassa and dissimilis.

Diagnosis. Mouthparts forming quadrate bundle. Labrum and epistome both strongly produced, prominent, separate, blunt. Incisor ordinary, molar triturative, medium, columnar, palp attached moderately proximal to molar. Inner plate of maxilla 1 naked; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl small. Coxa 1 large and visible, not tapering. Gnathopod 1 short, subchelate, article 5 shorter than 6, weakly lobate, palm almost transverse, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 without notch. Uropod 3 almost parviramous, peduncle weakly elongate, outer ramus 2-articulate. Telson short, cleft about 40%.

Additional characters. Head visible; rakers absent; plates of maxilla 2 narrow, inner short, armaments very weak.

Sexual dimorphism. Male unknown.

Relationship. Differing from Rifus in much weaker cleft of telson, larger article 2 on outer ramus of uropod 3 and unpleated gills. From Macronassa in presence of article 2 on outer ramus of uropod 3.

Species. Dissimina_ssa dissimilis (Stout, 1913) (Hurley, 1963) (J.L. Barnard, 1969a, 1979b) [369].

Habitat and distribution. Marine, Tomales Bay, California to the Galapagos Islands, 0-73 m, 1 species.

Douniaella Ledoyer


Type species. Douniaella longichelata Ledoyer, 1986, original designation.

Diagnosis. Mouthparts forming quadrate bundle, some weakly styliform. Labrum and epistome not prominent, weakly separate, blunt, labrum dominating epistome. Incisor ordinary, molar triturative, medium, columnar, palp attached moderately proximal to molar. Inner plate of maxilla 1 naked; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl small. Coxa 1 large and visible, not tapering. Gnathopod 1 short, subchelate, article 5 shorter than 6, weakly lobate, palm almost transverse, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 without notch. Uropod 3 almost parviramous, peduncle weakly elongate, outer ramus 2-articulate. Telson short, cleft about 40%.

Additional characters. Head visible; rakers absent; plates of maxilla 2 narrow, inner short, armaments very weak.

Sexual dimorphism. Male unknown.

Relationship. Differing from Concarne in much weaker cleft of telson, larger article 2 on outer ramus of uropod 3 and unpleated gills. From Macronassa in presence of article 2 on outer ramus of uropod 3.

Species. Douniaella longichelata Ledoyer, 1986 [618B].

Habitat and distribution. Marine, east of Pamanzi Island, Comoros Islands, 1800 m, 1 species.

Drummondia Lowry


Type species. Drummondia corinellae Lowry, 1984b, original description.

Diagnosis. Of pachynin form. Mouthparts forming
quadrature bundle. Labrum and epistome continuous, not differentially produced. Incisor ordinary, molar absent; palp attached strongly proximal. Inner plate of maxilla 1 weakly (1-3) setose; palp absent. Inner poorly and outer plates of maxilliped well developed, palp not exceeding outer plate, dactyl well developed. Coxa 1 large and visible, not tapering. Gnathopod 1 enlarged, strongly chelate, article 5 extremely short, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 without notch. Uropod 3 short, peduncle ordinary, inner ramus strongly shortened, outer ramus 2-articulate. Telson short, entire.

Additional characters. Base of flagellum on antenna 1 with calylnophore; mandible without rakers, toothed blade present, lacinia mobilis absent; spines on outer plate of maxilla 1, 11, sculptured; coxa 4 with well-developed posteroventral lobe; gnathopod 1 palm defined by complex spine; pereonite 5 with small dorsal tooth.

Variables. Setae of pereopods 3-7 encased in sheaths or not.

Relationship. Differing from other pachynins in the reduced inner ramus of uropod 3 and in having a lamina dentata on the mandibles.


Habitat and distribution. Marine, south-east Australia from Queensland to South Australia, 5-16 m, 2 species.

Ekelofia Lowry

Ekelofia Lowry, 1984b: 97.

Type species. Pachychelium oculatum Schellenberg, 1931, original description.

Diagnosis. Of pachynin form. Mouthparts forming quadrature bundle. Labrum and epistome continuous, not prominent. Incisor ordinary, molar absent; palp attached slightly distal. Inner plate of maxilla 1 (?) weakly setose; palp absent. Inner absent and outer plates of maxilliped well developed, palp scarcely exceeding outer plate, dactyl well developed. Coxa 1 large and visible, not tapering. Gnathopod 1 strongly enlarged, strongly chelate, article 5 very much shorter than 6, dactyl large; article 6 of gnathopod 2 slightly shorter than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 without notch. Uropod 3 short, peduncle ordinary, inner ramus slightly shortened, outer ramus 2-articulate. Telson short, entire.

Additional characters. Base of flagellum on antenna 1 well developed callynophore; mandible with rakers, toothed blade absent, lacinia mobilis absent; spines on outer plate of maxilla 1 simple, 6 (in 4-2 arrangement); coxa 4 with well-developed posteroventral lobe; gnathopod 1 palm defined by simple spine; pereonite 5 (? without dorsal tooth).

Relationship. Differing from other pachynins in the 4-2 spine formula on the outer plate of maxilla 1. From Pachychelium in the presence of rakers, defining spine on gnathopod 1 palm, well-developed posteroventral lobe of coxa 4 and expanded article 4 on pereopods 5-6.

Species. Ekelofia oculata (Schellenberg, 1931) (Lowry, 1984b) [833].

Habitat and distribution. Marine, South Georgia, 24-52 m, 1 species.

Elimedon J.L. Barnard


Type species. Elimedon cristatus J.L. Barnard, 1962d, original designation.

Diagnosis. Mouthparts forming quadrature bundle. Labrum and epistome ['not prominent, separate, labrum slightly dominant in projection, blunt']. Incisor ordinary, molar triturative, large, palp attached opposite molar. Inner plate of maxilla 1 moderately (3) setose; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp scarcely exceeding outer plate, dactyl well developed. Coxa 1 large and visible, not tapering. Gnathopod 1 short, strongly subchelate, palm oblique, article 5 longer than 6, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 without notch. Uropod 3 almost acquiramous, ordinary, peduncle ordinary, outer ramus 2-articulate. Telson elongate, cleft halfway.

Additional characters. Head 'small'; article 1 of flagellum on antenna 1 (much?) longer than articles 2-3 on peduncle combined; female antenna 2 about 1.5 times as long as antenna 1; mandibular palp article 3 half or less as long as article 2; article 2 of pereopods 5-6 narrowly rectangular (versus Hippomedon); pereopod 5 scarcely shortened; pereopod 7 longest; gill 7 [unknown].

Relationship. Differing from Hippomedon, Psammonyx and Wecomedon in the short article 3 of
the mandibular palp. From Paracentromedon in the
telson being cleft half or less.

See Douniaella.

**Species.** Elimedon brevicaudatus (Ledoyer, 1986)
[724A]; E. cristatus J.L. Barnard, 1962d [412A].

**Habitat and distribution.** Marine, Angola Basin,
8°28′E, 6°S, 3916 m, and basin south of Madagascar,
3923-3933 m, 2 species.

**Endevoura** Chilton

Endevoura Chilton, 1921d: 44.

**Type species.** Endevoura mirabilis Chilton, 1921d,
original designation.

**Diagnosis.** Mouthparts forming quadrate bundle.
Labrum and epistome [unknown, ?differentially
produced, ?epistome slightly dominant in projection and
blunt]. Incisor ordinary, molar weakly triturative, large,
setulose, palp attached strongly proximal to molar. Inner
plate of maxilla 1 weakly (1) setose; palp 2-articulate,
large. Inner and outer plates of maxilliped well developed,
palp strongly exceeding outer plate, dactyl well
developed. Coxa 1 slightly shortened and partly covered by
coxa 2, scarcely tapering. Gnathopod 1 short, simple, article 6
longer than 5, dactyl small, article 6 of gnathopod 2
slightly shorter than article 5, propodus minutely chelate.
Inner ramus of uropod 2 without notch. Uropod 3 short,
peduncle elongate, inner ramus slightly shortened,
outer ramus 2-articulate. Telson short, entire.

**Additional characters.** Flagella of antennae 1-2
reduced. Pereopod 3 grossly chelate.

**Variables.** Peduncle of antenna 1 with 3 distinct
articles (E. iara); coxa 1 large and ordinary (E.
dentarius; dactyl of pereopod 7 slender and even
(type), stunted (E. carpinei).

**Relationship.** Like Endevoura in the enlarged
prehensile pereopod 3 but dactyl of maxilliped
unguiform, not bulbous.

**Species.** Endsayara angustipes Ledoyer, 1978b, 1986
[693]; E. carpinei Bellan-Santini, 1974 [340B]; E. dentarius
Hirayama, 1985c [391]; E. iara Lowry & Stoddart, 1983a
[776s]; E. microphthalma Ledoyer, 1986 [698]; E. ramonella
J.L. Barnard, 1964e [376].

**Habitat and distribution.** Marine, cosmopolitan in
low latitudes, 1-1900 m, 6 species.

**Eucallisoma** J.L. Barnard

Figs 86C, 92P

**Type species.** Eucallisoma glandulosa J.L. Barnard, 1961a,
original designation.

**Diagnosis.** Mouthparts forming quadrate bundle.
Labrum and epistome differentially produced, epistome
weakly dominant in size and projection, blunt. Incisor
ordinary, molar simple, conical, smooth; palp attached
opposite molar. Inner plate of maxilla 1 strongly setose
medially; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl well developed. Coxa 1 large and visible, not tapering. Gnathopod 1 short, simple, article 5 longer than 6, dactyl vestigial, shrouded in setae; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely subchelate. Inner ramus of uropod 2 without notch. Uropod 3 ordinary, peduncle ordinary, inner ramus slightly shortened, outer ramus 2-articulate. Telson elongate, deeply cleft.

Additional characters. Head very small, lacking lateral lobes, not deformed; antenna 1 huge, primary flagellum conical, 90% calyponyphlic, with 2 apical articles; accessory flagellum similar, appressed to primary flagellum, 2-articulate; article 2 of gnathopod 1 sac-like, filled with dense globulose glandular tissue.

Relationship. Unique among scopelocheirins for the sac-like article 2 of gnathopod 1, conical antenna 1, small head, and reduction of setal shroud on gnathopod 1.

Species. Eucallisoma glandulosa J.L. Barnard, 1961a [412A].

Habitat and distribution. Marine, off Gabon, Atlantic Africa, 4°S, 4020 m, 1 species.

**Euonyx** Norman

Fig.921

Euonyx Norman, 1867b: 202—Lincoln, 1979a: 54.
Leptochela Broek, 1876: 190 [homonym, Decapoda] (Opis leptochela Bate & Westwood, 1868, monotypy).

Type species. *Euonyx chelatus* Norman, 1867b, monotypy.

Diagnosis. Mouthparts forming quadrate bundle. Labrum and epistome differentially produced, prominent, separate, epistome strongly dominant in size and projection, sharp or blunt. Incisor ordinary, molar of medium size, subconical, setulose, occasionally with weak apical triturative surface but considered as simple; palp attached strongly distal. Inner plate of maxilla 1 weakly (usually 3) setose; palp 2-articulate, large. Inner well and outer plate of maxilliped poorly developed (type only), palp strongly exceeding outer plate, dactyl well developed. Coxa 1 strongly shortened and partly covered by coxa 2, tapering. Gnathopod 1 elongate, thin, strongly chelate, article 5 longer than 6, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus strongly subchelate. Inner ramus of uropod 2 without notch or with weak notches. Uropod 3 ordinary, peduncle ordinary, inner ramus slightly shortened, outer ramus 2-articulate. Telson ordinary to elongate, deeply cleft.

**Additional characters.** Inner plate of maxilla 2 shorter than outer, lined with setae on apical half of medial margin; article 3 of gnathopod 1 elongate.

Variables. Body almost fully carinate (*E. scutatus*); article 1 of antenna 1 carinate (type, *E. coecus*), not carinate (*E. biscayensis*, *E. normani*, etc.); epistome produced (type), not produced (*E. pilroti*, etc.); molar present (*E. biscayensis*), conicosetulose (*E. normani*, etc.); spines on outer plate of maxilla 1 small (type), large (most other species); plates of maxilla 2 thin (*E. laqueus*, *E. talismani*); outer plate of maxilliped not larger than inner plate (type), much larger (most other species); plates of maxilliped thinner and more pointed (*E. talismani*); article 5 of gnathopod 1 much shorter than article 6, propodus sinuous (*E. normani*); propodus of gnathopod 2 powerful and palm excavate (type), feeble (*E. biscayensis*, *E. normani*); length of gnathopod 2 similar to gnathopod 1 (most species), gnathopod 2 much longer than gnathopod 1 (*E. talismani*).

Relationship. Differing from *Opisa* in the elongate, non-eusirid carpus of gnathopod 1 and the smaller outer plate of the maxilliped. From *Valettia* in the smooth incisor, non-acute outer plate of maxilliped, and the difference in size between coxae 1-2 (both small in *Valettia*). From *Aristohipps* in the stronger chela of gnathopod 1, the long unlobate carpus, lack of molar, cristate antenna 1 and the weaker outer plate of the maxilliped. From *Cheirimedon* in the thin, elongate and chelate gnathopod 1 and the outer plate of the maxilliped. From *Kyska* in the small coxa 1, thin gnathopod 1 and small outer plate of maxilliped.

**Species.** See Stephensen (1923b); *E. biscayensis* Chevreux, 1908a (Chevreux, 1935) (J.L. Barnard, 1961a) (Ledoyer, 1986) [426B, 619B]; *E. chelatus* Norman, 1867b (= *E. leptochela* Bate & Westwood, 1868) (Sars, 1895) (Gurjanova, 1951) (Lincoln, 1979a) [216l + B]; *E. coecus* Pilrot, 1933a [718B]; *E. conicus*us K.H. Barnard, 1955 (Griffiths, 1974c, 1975) [743]; *E. laqueus* J.L. Barnard, 1967a (Sekiguchi & Yamaguchi, 1983) [510BP]; *E. normani* Stebbing, 1888, 1906 [523B]; *E. pilroti* Sheard, 1938 (= *E. normani* identification of Chilton, 1921d) [780]; *E. scutatus* Griffiths, 1977a [701A]; *E. talismani* Chevreux, 1919-20 (Stephensen, 1923b) (Chevreux, 1927) [240B].

Habitat and distribution. Marine, cosmopolitan, descending into cold waters, demersal (coming to baited traps), occasionally associated with echinoderms and deep sea corals, rarely shallow in rock reefs (see 780 above), 1-2900 m, 9 species.

**Eurythenes** S.I. Smith

Figs 881, 89K, 90D, 93A, 95Q

Eurythenes Liljeborg, 1865b: 6 (homonym, Hymenoptera) (Gammarus gryllus Lichtenstein, 1822, monotypy).
**Eurythenes** S.I. Smith, 1884a: 54 (new name).

*Euryptera* Sars, 1895: 85 (new name, same type species).

*Katius* Chevreux, 1905b: 1 (*Katius obesus* Chevreux, 1905b, original designation).

**Type species.** *Gammarus gryllus* Lichtenstein, 1822, monotypy.

**Diagnosis.** Mouthparts forming quadrate bundle. Labrum and epistome differentially produced, prominent, separate, epistome strongly dominant in size and projection, blunt. Incisor ordinary, molar simple, huge, conicolaminate, setulose; palp attached opposite molar. Inner plate of maxilla 1 strongly setose but only apically; palp 2-articulate, large. Inner and outer plates of maxillipeds well developed, palp strongly exceeding outer plate, dactyl well developed but small. Coxa 1 strongly shortened and partly covered by coxa 2, tapering. Gnathopod 1 short, poorly subchelate, palm oblique, article 5 shorter than 6, scarcely lobate, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely chelate or subchelate. Inner ramus of uropod 2 without notch. Uropod 3 ordinary, peduncle ordinary, inner ramus slightly shortened, outer ramus 2-articulate. Telson elongate, deeply cleft.

**Additional characters.** Article 1 of antenna 2 swollen; both plates of maxilla 2 strongly setose medially.

**Variables.** Dactyls of pereopods short (*E. gryllus*), elongate (*E. obesus*); dorsal notching of pleonites 3-4 appearing late in life.

**Relationship.** Differing from *Alicella* and *Paralicella* in the short article 3 of gnathopod 1; *Alicella* and *Ambasia* have a simple gnathopod 1. From *Aristias* in the swollen article 1 of antenna 2, narrower inner plate of maxilla 2 and elongate telson. From *Hiroldeella* in the well-setose inner plate of maxilla 1; *Hiroldeella* has about 2 falcate setae only in adults, lacks oculus points on the head and has a shorter telson. From *Uristes* and *Tryphosella* in the immense molar, strongly setose inner plates of maxillae 1-2 and the swollen article 1 of antenna 2. From *Ambasiospis* by the unproduced labrum and more strongly setose maxillae 1-2. From *Tryphosoides* in the 2-articulate outer ramus of uropod 3.

*Adelella* has poorly developed and almost naked plates of maxillae 1-2 (except outer plate of maxilla 1), has a strange gnathopod 2 with slightly overlapping dactyl, and the rami of uropod 3 are not longer than the peduncle.

The following genera have a notch on the inner ramus of uropod 2: *Aristiospis, Schisturella, Metambasia*.

**Species.** See J.L. Barnard, 1961a; *E. gryllus* (Lichtenstein, 1822) (= *E. magellanica* Milne Edwards, 1848) (Sars, 1895) (Bowman & Manning, 1972) (Rauschert, 1986) [420 + BA]; *E. obesus* (Chevreux, 1905b) (?= *E. scotiae* Chilton, 1912d) (Bellan-Santini & Ledoyer, 1974) (Barnard & Shulenberger, 1976) [420 + BA].

**Habitat and distribution.** Marine, cosmopolitan, demersal, widely distributed vertically, probable migrant, usually bathy- to abyssopelagic and epibenthic, 0-6500 m, widely eaten by seabirds such as petrels, shearwaters, albatrosses, coming to deep sea bait, up to 90 mm in length, 2 species.

**Falcanassa n.gen.**

**Type species.** *Lysianassa falcata* Stephensen, 1933a, original designation.

**Etymology.** Composed from roots in *Lysianassa* and *falcata*.

**Diagnosis.** Mouthparts forming quadrate bundle. Labrum and epistome differentially produced, prominent, separate, labrum strongly dominant in size and projection, blunt. Incisor ordinary, molar simple; palp attached strongly proximal to molar. Inner plate of maxilla 1 weakly setose; palp 2-articulate, large. Inner and outer plates of maxillipeds well developed, palp [strongly] exceeding outer plate, dactyl [well developed]. Coxa 1 large and visible, not tapering. Gnathopod 1 strongly enlarged, falcate, poorly subchelate, palm oblique, article 5 shorter than 6 and thick, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 with large notch. Uropod 3 almost aequiramous, short, peduncle expanded, outer ramus 1-articulate. Telson ordinary, entire.

**Additional characters.** Gnathopod 1 enlarged, falcate.

**Relationship.** Like *Shoemakerella* and *Arugella* but male gnathopod 1 enlarged and falcate; and presumably inner plate of maxilla 2 not broadened. Like *Aruga* and *Lysiunassa* but outer ramus of uropod 3 1-articulate.

**Species.** *Falcanassa falcata* (Stephensen, 1933a, 1947b) [462Q].

**Habitat and distribution.** Anchialine, saline, Curacao, 1 species.

**Falklandia** De Broyer

*Falklandia* De Broyer, 1985c: 303.
**Type species.** *Orchomenopsis reducta* Schellenberg, 1931, original designation.

**Diagnosis.** Mouthparts forming quadrate bundle. Labrum and epistome prominent, coalesced. Incisor ordinary, molar simple, smooth, small; palp attached strongly proximal to molar. Inner plate of maxilla 1 weakly (2) setose; palp 2-articulate, large. Inner poorly and outer plates of maxilliped well developed, palp slightly exceeding outer plate, dactyl moderately well developed, slightly stubby. Coxa 1 large and visible, not tapering. Gnathopod 1 short, poorly subchelate, article 5 much shorter than 6, weakly lobate, palm transverse, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, palm absent. Inner ramus of uropod 2 without notch. Uropod 3 ordinary, peduncle ordinary, inner ramus slightly shortened, outer ramus 2-articulate. Telson slightly elongate, deeply cleft.

**Additional characters.** Apex of outer plate on maxilliped with 2 normal spines, medial margin with small nodular spines.

**Sexual dimorphism.** Male unknown.

**Relationship.** Differing from members of the *Orchomeone* complex in the fused prebuccal members. See *Doniaella*.

**Species.** *Falklandia reducta* (Schellenberg, 1931) (De Broyer, 1985c) [800 + B].

**Habitat and distribution.** Marine, Falkland Islands and Bellinghausen Sea, 197-569 m, 1 species.

*Figorella* J.L. Barnard


**Type species.** *Figorella tanidea* J.L. Barnard, 1962d, original designation.

**Diagnosis.** Of pachynin form. Mouthparts forming conical bundle, partly styliform. Labrum and epistome ["continuous, not prominent, blunt]. Incisor ordinary, molar absent; palp attached strongly distal. Inner plate of maxilla 1 strongly reduced, weakly (2) setose; palp ["articulate], large. Inner poorly and outer plates of maxilliped well developed, palp slightly exceeding outer plate, dactyl well developed. Coxa 1 large and visible, not tapering. Gnathopod 1 strongly enlarged, strongly chelate, article 5 shorter than 6, vestigial, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus subchelate. Inner ramus of uropod 2 without notch. Uropod 3 short, peduncle ordinary, inner ramus strongly shortened, outer ramus 2-articulate. Telson ordinary, entire.

**Additional characters.** Base of flagellum on antenna 1 without callynophore; mandible with rakers and left lacinia mobilis; spines on outer plate of maxilla 1 simple, 10, palp with small terminal setae; inner plate of maxilliped very reduced; coxa 4 with well-developed posteroventral lobe; defining spine of palm on gnathopod 1 small and simple; article 4 of pereopods 5-6 expanded.

**Variables.** Spine formula on outer plate of maxilla 1 equals 6/4 or 5/5; length of inner ramus on uropod 3 variable.

**Relationship.** Differing from *Pachymus* in the number of spines on the outer plate of maxilla 1 (10 versus 8), in the absence of a callynophore of the flagellum on antenna 1 and in the presence of terminal setae on the palp of maxilla 1.

**Species.** *Figorella tanidea* J.L. Barnard, 1962d [801A]; *F. tasmanica* Lowry, 1984b [784B].

**Gainella** Chevreux

Figs 92M, 93D

*Gainella* Chevreux, 1984b: 1167.

**Type species.** *Gainella chelata* Chevreux, 1912a,d, designated by Chevreux, 1912d.

**Diagnosis.** Mouthparts forming quadrate bundle, some weakly styliform. Labrum and epistome not prominent, separate, neither dominant in size nor projection, blunt. Incisor minutely toothed; molar weakly triturative, small; palp attached strongly proximal to molar. Inner plate of maxilla 1 weakly (1) setose; palp 2-articulate, large. Inner and outer plates of maxilliped poorly developed, palp strongly exceeding outer plate, dactyl well developed. Coxa 1 large and visible, not tapering. Gnathopod 1 slightly enlarged, poorly chelate, palm transverse to chelate, article 5 much shorter than 6, lobate, dactyl large. Article 6 of gnathopod 2 pointed, slightly shorter than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 without notch. Uropod 3 parviramous, short, peduncle ordinary, inner strongly shortened, outer ramus 2-articulate. Telson short, deeply cleft.

**Additional characters.** Article 1 of antenna 1 cristate; inner plates of maxilliped styliform, outer plates not exceeding inner, palp thin, geniculate, dactyl long and apically pubescent, coxa 1 expanded apically; article 6 of gnathopod 2 thin and tapering distally.
Relationship. Characterised by the styliform maxilliped similar to *Trischizostoma*; thus, differing from *Figuearella* and *Pachynus* in maxillipeds and cleft telson.

Differing from *Onesimoides* in the cleft telson, proximal mandibular palp and short article 5 of gnathopod 1. From *Euonyx*, *Schisturella*, and *Aristiopis* in the large coxa 1 and proximal mandibular palp. From *Valetta* in the parviramous uropod 3 and proximal mandibular palp. From *Cheirimedon* and *Opisa* in the large and apically expanded coxa 1, short telson, proximal mandibular palp and tiny inner ramus of uropod 3. From *Orchomene* and *Rimakoroya* in the cistate antenna 1, chelate gnathopod 1, and styliform palp of the maxilliped. From *Kyska* in the parviramous uropod 3, styliform maxillipedal palp and pointed gnathopod 2.

Like *Trischizostoma* but *Gainella* with ordinary coxae 1-4 and more normal lower lip, mandible, and maxillae 1-2.

Species. *Gainella chelata* Chevreux, 1912a,d [872BI].

Habitat and distribution. Marine, Antarctic, Alexander Island, 297 m, in sponge, 1 species.

Galathella Barnard & Karaman


Type species. *Schisturella galatheae* Dahl, 1959, original designation.

Diagnosis. Mouthparts forming quadrate bundle. Labrum and epistome not differentially produced, not prominent, separate, neither dominant, blunt. Incisor ordinary; molar triturative, large, palp attached opposite molar. Inner plate of maxilla 1 weakly (2) setose; palp 2-articulate, large. Innermost seta on inner plate of maxilla 2 dominant. Inner poorly and outer plates of maxilliped well developed, palp scarcely exceeding outer plate, dactyl well developed. Coxa 1 large and visible, barely tapering. Gnathopod 1 short, simple, article 6, dactyl small, shrouded in setae; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus subchelate. Inner ramus of uropod 2 with large notch. Uropod 3 ordinary, peduncle ordinary, inner ramus slightly shortened, outer ramus 2-articulate. Telson elongate, deeply cleft.

Additional characters. Article 2 of pereopod 5 with deeply incised posterior teeth.

Variables. Type species needs redescriptions, illustration of gnathopod 1 strange; shroud of gnathopod 1 mostly on propodus (type), mostly on dactyl (*G. teretis*); palm of gnathopod 2 transverse (type), oblique (*G. teretis*).

Relationship. Like *Lucayarina* but only pereopod 5 with indented article 2 and dactyl of gnathopod 1 with weak scopelocheirin appearance, thus dactyl short, with inner brush of digits and weakly covered by brushy shroud from article 6. Also like scopelocheirins and *Ichnopus* but pereopod 5 indentured. Differing from *Scopelocheirus* and *Aroui* in the poorly setose inner plate of maxilla 1.

Notes on species. *Glycerina woodmasoni* has a tooth on epimeron 3 and pereopod 6 has proportions distinct from Haswell’s original figures of *G. tenuicornis*.

Species. *Glycerina tenuicornis* (Haswell, 1879a) [781]; *G. affinis* Chilton, 1885b, also said to be *Amaryllis* species, Stebbing, 1906) (Haswell, 1882) [781]; *G.
Habitat and distribution. Marine, Australia to Red Sea, 0-1869 m, 3 species.

Type species. Anonyx hobloli Krøyer, 1846b, selected by Boeck, 1876.

Diagnosis. Mouthparts forming quadrate bundle. Labrum and epistome dierentially produced, labrum slightly to strongly dominant in projection, blunt. Incisor ordinary, molar triturative, large; palp attached slightly distal to or opposite molar. Inner plate of maxilla 1 weakly (2) setose; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp slightly exceeding outer plate, dactyl well developed. Coxa, 1 large and visible, not tapering. Gnathopod 1 simple, strongly to poorly subchelate, palm oblique, article 5 longer than 6, dactyl large; article 6 of gnathopod 2 slightly to greatly shorter than article 5, ordinary, propodus minutely subchelate. Inner ramus of uropod 2 without notch. Uropod 3 almost aquiramous, peduncle slightly elongate; outer ramus 2-articulate. Telson ordinary to elongate, deeply cleft.

Additional characters. Head 'small'; base of primary flagellum on antenna 1 with callynophore, more than twice as long as articles 2-3 of peduncle combined; antenna 2 much longer than antenna 1; mandibular rakers few; pereopod 5 not shortened, pereopod 6 longest; some gills with accessory lobes, gill 7 present; each lobe of telson apex with 1-2 spines only (versus Paratyphosistes).

Sexual dimorphism. Male antennae 1-2 better armed with aesthetascs and carceoli, antenna 2 flagellum slightly more elongate but uropod 3 not necessarily more strongly armed.

Variables. Eyes well developed (H. oculatus), weak or absent (type, etc.), unusual corneal lens present (H. hobloli); antenna 1 carinate (H. denticulatus, H. nasutus); mandibular palp article 3 varying between 0.5 and 1.0 times as long as article 2; mandibular rakers absent (H. denticulatus), or 2 present (H. antitemplado); inner plate of maxilla 1 generally with 2-5 apical setae but 9 setae present (H. tasmanicus); coxa 1 slightly tapering but not shortened (H. tasmanicus); gnathopod 1 strongly subchelate (H. punctatus), poorly subchelate H. angustimanus), simple (H. serratus); article 5 = 6 on gnathopod 1 (H. concolor); serrations on article 2 of pereopods 5-7 slightly enlarged (H. kurilicus); gills 5-6 each with one accessory lobe (H. antitemplado), with 3-4 (H. denticulatus); urosomite 1 with carina (H. antitemplado, H. concolor, H. hobloli, H. longimanus); peduncle of uropod 3 apically expanded and produced (H. incisus), inner ramus slightly shortened (H. minusculus); telson of intermediate length compared to Paratyphosistes (H. kurilicus).

Relationship. Differing from Tryphosella in proximal position of mandibular palp and incised inner ramus of uropod 2. From Orchomene in tapering coxa 1 and incised inner ramus of uropod 2. From Timetonyx in short urosomite 1 with carina (H. angustimanus); coxa 1 slightly tapering but not shortened (H. tasmanicus); gnathopod 1 strongly subchelate (H. punctatus), poorly subchelate H. angustimanus), simple (H. serratus); article 5 = 6 on gnathopod 1 (H. concolor); serrations on article 2 of pereopods 5-7 slightly enlarged (H. kurilicus); gills 5-6 each with one accessory lobe (H. antitemplado), with 3-4 (H. denticulatus); urosomite 1 with carina (H. antitemplado, H. concolor, H. hobloli, H. longimanus); peduncle of uropod 3 apically expanded and produced (H. incisus), inner ramus slightly shortened (H. minusculus); telson of intermediate length compared to Paratyphosistes (H. kurilicus).

Additional characters. Head 'small'; base of primary flagellum on antenna 1 with callynophore, more than twice as long as articles 2-3 of peduncle combined; antenna 2 much longer than antenna 1; mandibular rakers few; pereopod 5 not shortened, pereopod 6 longest; some gills with accessory lobes, gill 7 present; each lobe of telson apex with 1-2 spines only (versus Paratyphosistes).

Sexual dimorphism. Male antennae 1-2 better armed with aesthetascs and carceoli, antenna 2 flagellum slightly more elongate but uropod 3 not necessarily more strongly armed.

Variables. Eyes well developed (H. oculatus), weak or absent (type, etc.), unusual corneal lens present (H. hobloli); antenna 1 carinate (H. denticulatus, H. nasutus); mandibular palp article 3 varying between 0.5 and 1.0 times as long as article 2; mandibular rakers absent (H. denticulatus), or 2 present (H. antitemplado); inner plate of maxilla 1 generally with 2-5 apical setae but 9 setae present (H. tasmanicus); coxa 1 slightly tapering but not shortened (H. tasmanicus); gnathopod 1 strongly subchelate (H. punctatus), poorly subchelate H. angustimanus), simple (H. serratus); article 5 = 6 on gnathopod 1 (H. concolor); serrations on article 2 of pereopods 5-7 slightly enlarged (H. kurilicus); gills 5-6 each with one accessory lobe (H. antitemplado), with 3-4 (H. denticulatus); urosomite 1 with carina (H. antitemplado, H. concolor, H. hobloli, H. longimanus); peduncle of uropod 3 apically expanded and produced (H. incisus), inner ramus slightly shortened (H. minusculus); telson of intermediate length compared to Paratyphosistes (H. kurilicus).

Relationship. Differing from Tryphosella in proximal position of mandibular palp and incised inner ramus of uropod 2. From Orchomene in tapering coxa 1 and incised inner ramus of uropod 2. From Timetonyx in short urosomite 1 with carina (H. angustimanus); coxa 1 slightly tapering but not shortened (H. tasmanicus); gnathopod 1 strongly subchelate (H. punctatus), poorly subchelate H. angustimanus), simple (H. serratus); article 5 = 6 on gnathopod 1 (H. concolor); serrations on article 2 of pereopods 5-7 slightly enlarged (H. kurilicus); gills 5-6 each with one accessory lobe (H. antitemplado), with 3-4 (H. denticulatus); urosomite 1 with carina (H. antitemplado, H. concolor, H. hobloli, H. longimanus); peduncle of uropod 3 apically expanded and produced (H. incisus), inner ramus slightly shortened (H. minusculus); telson of intermediate length compared to Paratyphosistes (H. kurilicus).
See Douniaella.

**Removals.** *Hippomeden brevicaudatus* Ledoyer, 1986; to *Elimedon*; *H. whoro Fenwick to *Paracentromedon*; possibly *H. manene* and *H. matikuca* also to *Paracentromedon* (ride Lowry, in litt., 1991).


**Habitat and distribution.** Marine, cold water and submergent, cosmopolitan, 0-4400 m, 49 species.

**Hirondelea Chevreux**

Figs 90V, 93B

**Hirondelea Chevreux, 1889a: 285.**

*Tetroychyla* Stephensen, 1923b: 63 (*Tetroychyla abyssalis* Stephensen, 1922b, original designation).

**Type species.** *Hirondelea trioreata* Chevreux, 1889a, original designation.

**Diagnosis.** Mouthparts forming quadrate bundle. Labrum and epistome differentially produced, prominent, separate, both strong in projection, blunt. Incisor ordinary, molar weakly simple, large, conical or subconical, setose; palp attached opposite molar. Inner plate of maxilla 1 weakly (2) setose, in adults setae sickle shaped; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl well developed. Coxa 1 strongly shortened and partly covered by coxa 2, tapering or subrectangular. Gnathopod 1 short, strongly subchelate, palm transverse, sometimes chelate, article 5 subequal to or longer than 6, dactyl long; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 with or without large notch. Uropod 3 almost acquisimaur, ordinary, peduncle ordinary, outer ramus 2-articulate. Telson elongate, deeply cleft.

**Additional characters.** Eyes when present diffuse, present on the top and sides and forming a sickle shape from lateral view; inner plate of maxilla 1 with falcate or sickle setae in adults; medial apex of palp on maxilla 1 toothed; plates of maxilla 2 short and stout; accessory gill on coxae 5-6 (*H. antarctica*, *H. gigas*).

**Sexual dimorphism.** Flagellum of male antenna 1 proliferate and more elongate (*H. gigas*); articles 4-5 of antenna 2 with anterior male armament tufts, flagellum
elongate (H. gigas).

**Variables.** Eyes forming sinuous upside-down question mark or divided into 3 parts, 2 side and 1 top; article 1 of antenna 1 carinate (H. dubia); article 1 of accessory flagellum flat (H. dubia); setae on inner plate of maxilla 1 not sickle-shaped, just thick (H. gigas); outer plate of maxilliped smaller than in type (H. gigas); dactyl of gnathopod 1 very long (H. fidenter), with spinules (H. fidenter), with teeth and setae (young H. gigas); dactyl of gnathopod 1 poorly shrouded, visible (I. nossibeensis); dactyl of gnathopod 1 with inner brush; article 2 of gnathopod 2 greatly shorter than article 5, propodus minutely subchelate. Inner ramus of uropod 2 with (type) or without large notch. Uropod 3 ordinary, peduncle slightly elongate, inner ramus slightly shortened, outer ramus 2-articulate. Telson elongate, deeply cleft.

**Relationship.** Differing from Eurythenes in the short chela of gnathopod 1. From Opisa and Cheirimedon in the feeble gnathopod 1 and more equally extending rami of uropod 3. From Adelieida in the longer and more deeply cleft telson, longer rami of uropods 1-2, better armed maxillae, more conicolaminate molar and stronger lobe of coxa 4. From Aristiopsis in the unlobate wrist of gnathopod 1 and longer telson. From Paralicella and Aliceella in the short article 3 of gnathopod 1 and the poor medial setosity on the inner plates of maxillae 1-2. From Eurythenes in the weak article 1 of antenna 2, larger head, and fewer setae on the inner plate of maxilla 1. From Ambasiopsis in the lack of a differentially produced labrum and larger head.


**Habitat and distribution.** Marine, Antarctica shallow and cosmopolitan abyssal and hadal, 170-10, 190 m (deepest amphipod record, H. gigas, Philippine Trench), 7 species.

**Ichnopus Costa**

Figs 891, 90J, 91M, 92K, 95P


**Type species.** Ichnopus taurus Costa, 1853, monotypy.

**Diagnosis.** Of scopelocheiron form. Mouthparts forming quadruple bundle. Labrum and epistome differentially produced, not prominent, separate, labrum slightly dominant in size and projection, blunt. Incisor ordinary, molar simple, small, conicolaminate or subconical, setulose; palp attached opposite molar. Inner plate of maxilla 1 weakly (2) setose; palp 2-articulate, large. Inner poorly, and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl well developed. Cox 1 large and visible, not tapering. Gnathopod 1 short, simple; articles 5 and 6 subequal, dactyl small, shrouded in setae; article 6 of gnathopod 2 greatly shorter than article 5, propodus minutely subchelate. Inner ramus of uropod 2 with (type) or without large notch. Uropod 3 ordinary, peduncle slightly elongate, inner ramus slightly shortened, outer ramus 2-articulate. Telson elongate, deeply cleft.

**Additional characters.** Antenna 1 article 1 (or 2) with ventral tooth, mandibular palp article 3 sickle-shaped; lower lip without medial gap; article 3 of gnathopod 1 elongate; dactyl of gnathopod 1 with inner brush; article 6 of pereopods 3-4 not elongate; pereopod 7 longer than pereopod 6; rami of uropod 3 very setose in both sexes; gills pleated.

**Sexual dimorphism.** Male eyes enlarged; primary flagellum of antenna 1 with calylophore; antenna 2 flagellum elongate, articles beak-like and calceoliferous, articles 4-5 of peduncle swollen, with anterior male tufts; female of I. spinicornis also with male-like antenna 2.

**Variables.** Antenna 2 of male and female alike or female with male sexual attributes (I. spinicornis); dactyl of gnathopod 1 poorly shrouded, visible (I. nossibeensis); gnathopod 2 not minutely subchelate (I. nossibeensis); article 2 on pereopod 5 indented like Lucayrina (I. pseudoserratus); notch on inner ramus of uropod 2 weak or absent (I. pelagicus); uropod 3 not setose (I. pseudoserricus).

**Relationship.** Resembling scopelocheirins, but either maxilla 1 not medially setose, or gnathopod 1 dactyl visible and brush small, or mandibular palp article 3 sickle-shaped and bent strongly.

Differing from scopelocheirins, especially Aroui and Scopelocheirus, in the non-chelate gnathopod 2, much more visible dactyl of gnathopod 1, and lack of medial setae on maxilla 1. From Paracallisomopsis in the elongate article 3 of gnathopod 1, lack of constriction on the inner ramus of uropod 2, long antennae, and sickle-shaped article 3 of the mandibular palp. From Socarnoides in the longer telson with deeper cleft, the tooth on antenna 1, brushy dactyl of gnathopod 1, rounded outer plate of the maxilliped, and the long rami of uropod 3. From Menigratopsis in the strongly setose rami of uropod 3, brushy dactyl of gnathopod 1, tooth on antenna 1, long antennae, and long pereopods 5-7. From Paronesimus in the non-palmed gnathopod 1 with brushy dactyl, setose
rami of uropod 3, small dactyl of gnathopod 2, and the deeply cleft telson. From Menigrates in the elongate telson, brushy dactyl of gnathopod 1, tooth on antenna 1, and sickle-shaped article 3 of the mandibular palp. From Socarnes in the brushy dactyl of gnathopod 1 and tooth of antenna 1 on the antenna 1.

See Cicadosa and Locayarina.


**Habitat and distribution.** Marine, cosmopolitan in low latitudes (50° or less), coming up in open trawls but probably mostly epipelagic, 0-300 (3503) m, 5 species.

**Izninkala** Griffiths


**Type species.** *Izninkala fihla* Griffiths, 1977b, original designation.

**Diagnosis.** Mouthparts forming quadrate bundle, some parts styliform. Epistome minutely produced. Incisor ordinary (with inner and outer sharp wing teeth), molar absent; palp attached strongly distal. Inner plate of maxilla 1 ['naked or absent'] [outer plate undescribed]; palp 1-articulate. Inner and outer plates of maxilliped obsolete, palp long and thin, strongly exceeding outer plate, dactyl well developed, tumid. Coxa 1 strongly shortened, almost obsolete, fully covered by coxa 2. Gnathopod 1 elongate, filiform, chelate, palm transverse, article 5 much longer than 6, dactyl small, stubby, grotesque; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 without notch. Uropod 3 very short, peduncle very short and broad, inner ramus weakly to strongly shortened, outer ramus 2-articulate. Telson elongate, entire.

**Additional characters.** Head small, article 1 of antenna 1 with sharp distoventral tooth, article 2 with large nasiform distodorsal tooth, article 3 short, article 4 tumid and brushy (long, thick aesthetasces), both flagella 3-articulate; article 5 of antenna 2 much shorter than 4, flagellum 3-articulate; lower lip and maxillae poorly identified, apparently palp of maxilla 1 1-articulate, with 1 apical spine; maxilla 2 with flabellate inner plate and thinner outer plate each with 1 seta; gnathopod 1 strongly filiform, article 3 very elongate, palm protruding, defined by large spine, dactyl stubby, large, grotesque; urosomite 1 with nasiform dorsal keel; uropod 3 partly enveloped by urosomite 3, peduncle very short and broad, outer ramos with exaggerated apical tooth on article 1, article 2 spiniform; telson partly enveloped by urosomite 3, elongate, narrow, entire, with 2 apical and 2 dorsal giant spines.

**Variables.** Uropod 3 with subequal rami, article 2 absent on outer rama (Ledoyer, 1986).

**Relationship.** Resembling a stenothoid (thumatelesin), especially in the giant spines of the telson and nasiform process on antenna 1 and shape of maxilliped, with plates obsolete. Differing from Kerguellea in the obsolescent coxa 1, nasiform article 2 of antenna 1, distinct incisor, longer rami of uropod 3 and weakly subchelate gnathopod 1. From Lepidepecreum in the obsolescent coxa 1, reduced uropod 3, urosimomial telson, filiform gnathopod 1, and degenerate mouthparts. Rather similar to Clepidicrella but differing in more filiform gnathopod 1 with article 3 elongate, obsolescent coxa 1, fully obsolescent plates of the maxillipeds, strange telson with stenothoid spines and broad article 2 of pereopod 5 (thin in Clepidicrella).

**Species.** *Izninkala fihla* Griffiths, 1977b (Ledoyer, 1986) [621B].

**Habitat and distribution.** Marine, off southern Africa, 200-680 m, 1 species.

*Kakanui* Lowry & Stoddart


**Type species.** *Kakanui punui* Lowry & Stoddart, 1983a, original designation.

**Diagnosis.** Mouthparts forming quadrate bundle. Labrum and epistome continuous, differentially produced, prominent, coalesced, epistomal part strongly dominant in projection, blunt. Incisor ordinary, molar simple, small, setulose; palp attached strongly proximal to molar. Inner plate of maxilla 1 weakly (1) setose; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp slightly exceeding outer plate, dactyl small. Coxa 1 large and visible, not tapering. Gnathopod 1 short, simple, article 5 shorter than 6, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 with notch. Uropod 3 short
paralysianopsis 'in the simple gnathopod 1 presence of articulate spines on the palp of maxilla 1, pleopodal rami with only 4 articles, peduncles expanded basally; article 2 on outer ramus of uropod 3 elongate.

Relationship. Differing from Lysianassa in the presence of articulate spines on the palp of maxilla 1, the 'large telson’ (in relation to urosome), and the 2-articulate outer ramus of uropod 3. From Lysianoposis in the articulate spines on the palp of maxilla 1. From Paralysianoposis 'in the simple gnathopod 1', and elongate article 1 of the mordial palp.


Habitat and distribution. Marine, austral islands and South Australia, 0-100 m, 2 species.

Kerguelenia Stebbing
Figs 88G, 90C, 91J, 92O

Type species. Kerguelenia compacta Stebbing, 1888, monotypy.

Diagnosis. Mouthparts forming quadrate bundle, some styliform. Labrum and epistome continuous, not differentially produced, prominent, ?coalesced, projection blunt. Incisor absent; molar absent; palp attached at distal end of mandible. Inner plate of maxilla 1 reduced and naked; palp 2-articulate, large. Inner poorly and outer plates of maxilliped well developed (type only), palps strongly exceeding outer plate, dactyl well developed. Coxa 1 large and visible, but tapering. Gnathopod 1 elongate, thin, flagelliform, simple, articles 5 and 6 subequal, dactyl large, weakly shrouded in setae; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, often both very elongate and linear, propodus minutely chelate. Inner ramus of uropod 2 without notch. Uropod 3 short, peduncle short, inner ramus slightly shortened or absent, outer ramus 1 or 2-articulate. Telson ordinary to short, entire.

Additional characters. Incisor absent; outer plate of maxilla 1 with 6 or fewer spines; plates of maxilla 2 small but well setose; maxillipedal palp almost filiform, dactyl elongate; article 3 of gnathopod 1 elongate; posterioventral lobe of coxa 4 immense; article 2 of pereopods 5-6 linear at least basally, article 4 widely expanded.

Sexual dimorphism. Male antenna 1 article 3 brushy (K. borealis).

Variables. Article 1 of antenna 1 carinate (K. adeliensis, K. antarctica, K. borealis, K. glacialis), not carinate (K. compacta); inner plate of maxilla 2 especially small (K. adeliensis, K. borealis); inner plate of maxilliped rounded (K. antarctica, K. glacialis), outer plate no larger than inner plate and both plates very reduced (K. borealis, K. eoa); dactyl of gnathopod 1 not shrouded (K. macropod); article 2 of pereopod 5 dilated (K. glacialis, K. eoa, K. palpalis), not dilated (K. adeliensis, K. antarctica, K. compacta), nasiform (K. borealis, K. reducta); article 2 of pereopod 6 dilated (K. macropod, K. microphthalma); uropod 3 parviramous (K. b. japonica); with 1 ramus of 1 article (K. compacta, K. eoa), with reduced rama fused to peduncle (K. reducta), with 2 small rami, outer 2-articulate K. borealis.

Oddities. Kerguelenia palpalis with stout palp of maxilliped and parviramous uropod 3.

Relationship. Close to Clepidecrella but differing in loss of incisor, more flagellate gnathopod 1 and elongate article 3 of gnathopod 1.

Differing from Paralysianoposis and Parawaldeckia in the loss of incisor, reduction of maxillae and plates of maxillipeds and reduction of uropod 3. From Azotostoma in the tapering though large coxa 1, loss of incisor, reduced plates of the maxilliped, reduced maxillae and reduced rami of uropod 3. From Lysianassa and allies in the elongate article 3 of gnathopod 1, flagellate gnathopod 1 and weak uropod 3. From Onesiumidae, Nannonyx, and Paronesimoidae in the simple gnathopod 1 and reductions in mouthparts. From Menigrates in the flagellate gnathopod 1 with elongate article 3, unclef telson, and reduced mouthparts and uropod 3. From Acidostoma and allies in the loss of incisor and much reduced outer plate of the maxilliped. From Scopelocheirus and allies in the loss of incisor, reduction of maxillipedal plates and size of maxillae, and reduction of urosome, uropod 3 and telson.


Habitat and distribution. Marine, probably cosmopolitan (not yet found in most of Indo-Pacific deeps), mostly coldwater and submergent (except K. macropod a, K. reducta), 15-3700 m, 10 species.
Koroga Holmes

Koroga Holmes, 1908: 502.

Type species. *Koroga megalops* Holmes, 1908, original designation.

Diagnosis. Mouthparts forming quadrate bundle. Labrum and epistome separate, neither dominant in size nor projection, blunt. Incisor ordinary, molar simple, small, conicolaminate, setulose; palp attached strongly proximal to molar. Inner plate of maxilla 1 weakly (3) setose; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl well developed. Coxa 1 large and visible, not tapering. Gnathopod 1 enlarged, strongly chelate, article 5 much shorter than 6, lobate, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 without notch. Uropod 3 ordinary, peduncle ordinary, inner ramus slightly shortened, outer ramus 2-articulate. Telson elongate, entire or emarginate.

Additional characters. Head 'large'; dactyl of maxilliped elongate, as long as article 3; coxa 1 expanded anteroventrally (versus *Pseudokoroga*), spines on outer plate of maxilla 1 widely disjunct (versus *Orchomene* complex).

Relationship. Like *Anonyx* but gnathopod 1 chelate. See *Gainella*.

Species. *Koroga megalops* Holmes, 1908 [273].

Habitat and distribution. Marine, Alaska, Kyska Island, 11-15 m, 1 species.

**Lepidepecreella** Schellenberg

Fig.95J


Type species. *Lepidepecreella ctenophora* Schellenberg, 1926a, monotypy.

Diagnosis. Of cyphocarin proportions with tall slightly deformed head bearing huge anterior keel. Coxae 1-2 strongly shortened and covered by coxa 3, coxae 3-4 long, coxa 5 shorter but large. Antennae of medium length, primary flagellum of antenna 1 with callynophore, accessory flagellum elongate. Mouthparts forming [?conical bundle], some styliform. Labrum and epistome continuous, not differentially produced, prominent, coalesced, blunt. Incisor ordinary, molar simple, large, often conicolaminate or subconical, setulose; palp attached strongly proximal to molar. Inner plate of maxilla 1 naked; palp 1-articulate, large. Inner and outer plates of maxilliped well developed, palp slightly exceeding outer plate, dactyl well developed. Gnathopod 1 elongate, simple, article 5 shorter than 6, dactyl large; article 6 of gnathopod 2 slightly shorter than article 5, both elongate, propodus minutely chelate. Inner ramus of uropod 2 without notch. Uropod 3 ordinary, peduncle elongate, inner ramus strongly shortened...
or absent, outer ramus 1 or 2-articulate. Telson short, entire.

Additional characters. Above epistome head with large medial anterior keel; dactyl on gnathopod 1 elongate, combed and with 2 longer apical setae; article 4 of pereopods 5-7 very strongly expanded and posterovertrally lobate; pleonites 3-4 carinate or toothed dorsally.

Variables. Differences minor among species; mandibular palp poorly setose (type, L. tridactyla), well setose (others); apex of dactyl on gnathopod 1 with 2 setae, together forming trifid fork (L. tridactyla), article 6 of gnathopod 1 longer than 5, or article 5 equals 6; article 2 of pereopod 3 linear (type, L. emarginata, L. cymba), broad (L. bidens), without nasiform lobe (type, etc.), with posterodistal nasiform process (L. bidens); inner ramus of uropod 3 present (type), absent (L. bidens, L. emarginata, L. tridactyla), outer ramus of uropod 3 1 or 2-articulate, long or short; telson emarginate (L. emarginata).

Relationship. Among cyphocarins characterised by large anterior keel on head, almost flagelliform gnathopod 1 with long or setulose dactyl, small or absent inner ramus of uropod 3, unleft telson and greatly expanded article 4 of pereopods 5-7.

Differing from Azotosoma in reduced coxae 1-2 of cyphocarin form, short inner ramus of uropod 3, and large well-developed maxillipedal palp. From Phoxostoma in the cyphocarin body form with coxae 1-2 reduced, inner ramus of uropod 3 reduced, and head with keel. From Cebocaris in the simple pereopods, elongate gnathopod 1 with elongate dactyl, better developed antennae, smaller coxa 5 and strongly expanded article 4 of pereopods 5-7. From Crybelocyphocaris in the unfused urosum, elongate gnathopod 1 and long coxae. From Mesocyphocaris and Metacyphocaris in the unleft telson, shorter outer ramus of uropod 3 and the elongate gnathopod 1.

See Cyclocaris.


Habitat and distribution. Marine, cold water, bipolar, primarily Antarctica and Arctic, Mediterranean, tropically submersgent in bathyal basins, but night surface New Zealand, 0-2500 m, 8 species.

Lepidepecreoides K.H. Barnard
Fig.88F


Type species. Lepidepecreoides xenopus K.H. Barnard, 1931a, original designation.

Diagnosis. Mouthparts forming quadrangular bundle. Labrum and epistome differentially produced, not prominent, separate, labrum slightly dominant in size and projection, blunt. Incisor ordinary, molar triturative, large; palp attached opposite molar. Inner plate of maxilla 1 weakly (3-2) setose; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl well developed. Coxa 1 large and visible, not tapering. Gnathopod 1 short, subchelate, palm oblique, articles 5 and 6 subequal, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 without notch. Uropod 3 ordinary, peduncle ordinary, inner ramus scarcely shortened, outer ramus (? 2-articulate (L. nubifer)). Telson elongate, deeply cleft.

Additional characters. Head small; accessory flagellum very short, 2-articulate; coxa 4 with posterovertrally lobe very weak; coxa 5 as long as 4, fitting excavate margin of 4 very tightly; article 2 of pereopod 5 with blunt or sharp spur posteriorly and blunt spur (lobe) posterovertrally; integument indurated; pereonites 5-7 with lateral knob (unknown in L. nubifer).

Variables. Head broadly subtruncated (weakly concave) anteriorly, ocellar lobe not projecting beyond rostrum, no antennal sinus below (type), with ocellar lobe (L. nubifer); mandibular incisor faintly denticulate (L. nubifer); both spurs of pereopod 5 sharp (L. nubifer); outer ramus of uropod 3 with weak article 2 (L. nubifer, possibly present in type).

Relationship. Differing from Valettiopsis in the weakly setose maxillae and unshortened coxa 1. From Valetta in the non-chelate gnathopod 1, long anterior coxae, large coxa 5, and lack of notch on the inner ramus of uropod 2. From Hippomedon in the long narrow coxa 4, unexpanded coxa 1, deeply truncate head, absence of tooth on epimeron 3, presence of dorsal process on pleonite 4, and spurred pereopod 5. From Psammonyx in the long coxa 5, and teeth on both pereopod 5 and urosome. From Poromesimus in the triturative molar, presence of spurs on pereopod 5 and the more strongly subchelate gnathopod 1.

Very close to Tryphosoides, situation unclear, but latter differing in lack of spurs on pereopod 5 and presence of tooth on epimeron 3.
Bearing many characters in common with certain species of *Uristes* but differing in long coxa 1, unshortened carpus of gnathopod 1, and teeth on pereopod 5 and urosomite 1.

**Species.** *Lepidopercoides nubifer* J.L. Barnard, 1971b (Griffiths, 1977a) [310a + 701a]; *L. xenopus* K.H. Barnard, 1931a, 1932 [865b].

**Habitat and distribution.** Marine, probably cosmopolitan, southpolar or deep cold water, 135-2860 m.

*Lepidopercrum* Bate & Westwood

Figs 86G, 87A, 89F, 93F


**Type species.** *Lepidopercrum carinatum* Bate & Westwood, 1868, selected by Stebbing, 1888.

**Diagnosis.** Mouthparts forming quadrate bundle. Labrum and epistome differentially produced, prominent, separate, epistome strongly dominant in size and projection, blunt. Incisor ordinary, molar simple, small to medium, conicolimate or subconical or setulose or smooth; palp attached strongly proximal to molar. Inner plate of maxilla 1 weakly (2) setose; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl well developed. Coxa 1 slightly shortened and partly covered by coxa 2, (type) or not. Gnathopod 1 subchelate, palm oblique, articles 5 and 6 variable, either dominant, dactyl large; article 6 of gnathopod 2 slightly shorter than article 5, ordinary, propodus minutely subchelate. Inner ramus of uropod 2 without notch. Uropod 3 almost acicular, ordinary, peduncle scarcely elongate, outer ramus 2-articulate. Telson elongate, deeply cleft or rarely entire.

**Additional characters.** Body and antenna 1 carinate, telson spinose.

**Sexual dimorphism.** Male eyes slightly enlarged; antennae 1-2 more strongly armed than in female; primary flagellum on antenna 1 with callynophore; flagellum of antenna 2 elongate and calceolate; coxae 1-4 relatively smaller than in female; pleosome enlarged; uropod 3 more setose and article 2 on outer ramus often vestigial or absent.

**Variables.** Cuticle often punctate or ornamented (*L. comatum*, etc.); article 1 on antenna 1 not carinate (*L. chevreuxi*, *L. cingulatum*, *L. tawalae*, *L. typhlops*, etc.); primary flagellum on antenna 1 without callynophore (several species); accessory flagellum absent (type), 1+articulate (others); molar well triturative (*L. foraminiferum*); spines on outer plate of maxilla 1 occasionally reduced or fused together (*L. clypodentatum*); article 2 of pereopods 5-6 heavily serrate (*L. chevreuxi*), of 5-7 heavily serrate (*L. foraminiferum*); articles 3-7 of pereopod 7 together reduced in size (*L. clypeatum*, *L. clypodentatum*, etc.); only urosome carinate (*L. nautilus*, etc.); outer ramus of uropod 3 1-articulate (*L. vitjazi* identification of Hirayama, 1985c); telson not very elongate (*L. cingulatum*); telson weakly cleft (*L. carinatum*), or unclawed (*L. infissum*); telson very spiny (*L. eoum*, *L. nautilus*, etc.), not spiny (type, *L. umbro*, etc.).

**Relationship.** A probable polyphyletic and artificial genus differing from *Orchomene* in the advancement of diverse characters, none being shared among all species: carinate body, carinate antenna 1, reduced accessory flagellum, elongate or spiny telson.


**Habitat and distribution.** Marine, cosmopolitan but mostly northern hemisphere and tropics, mostly coldwater, 0-1861 m, 28 species.

*Lepiduristes* Barnard & Karaman

Lucayarina Clark & Barnard


Type species. Lucayarina catacumba Clark & Barnard, 1985, original designation.

Diagnosis. Mouthparts forming quadrate bundle. Labrum and epistome differentially produced, separate, neither labrum nor epistome dominant in size, projection blunt. Incisor ordinary, molar triturative, large; palp attached opposite molar. Inner plate of maxilla 1 weakly (2) setose; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl well developed. Coxa 1 large and visible, not tapering. Gnathopod 1 short, simple, articles 5 and 6 subequal, dactyl large, not shrouded in setae; article 6 of gnathopod 2 shorter than article 5, ordinary; propodus minutely chelate. Inner ramus of uropod 2 without notch. Uropod 3 ordinary but peduncle elongate, inner strongly shortened, outer ramus 2-articulate. Telson ordinary, deeply cleft.

Additional characters. Laciniae mobiles absent; article 2 of pereopods 5-7 deeply indentured; outer plate of maxilliped uniformly spinose mediobasally to apex, spines weak, stubby; gills sac-like, not pleated, with small basal accessory lobe.

Relationship. Differing from Glycerina and Ichnopus in the less shrouded (scopelocheirin-type) gnathopod 1 and the strong cuspidation of all pereopods 5-7 article 2; additionally from Ichnopus in the lack of a tooth on antenna 1. From Aroui and Menigratopsis in the pereopodal teeth.

Species. Lucayarina catacumba Clark & Barnard, 1985 [481Z].

Habitat and distribution. Marine, Bahamas Islands, in blue holes (sea caves), 15 m, 1 species.
small, conicolaminate, setulose; palp attached strongly proximal to molar, article 1 short in type. Inner plate of maxilla 1 not setose; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl well developed. Coxa 1 large and visible, not tapering. Gnathopod 1 simple, articles 5 and 6 subequal, dactyl small; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely subchelate. Inner ramus of uropod 2 with (type) or without notch. Uropod 3 aequiramous, ordinary, peduncle elongate, outer ramus 1-articulate. Telson ordinary, entire.

**Additional characters.** Outer plate of maxilla 1 with 11 spines; outer plate of maxilla 2 narrowed; gills pleated (at least in type).

**Sexual dimorphism.** Male eyes enlarged; antenna 2 elongate, articles 4-5 enlarged, with male tufts, uropod 3 setose.

**Relationship.** The basic 'Lysianassa'.

**Removals.** Lysianassa alba Holmes, 1905, to Lysianassina; L. bonaiensis Stephens, 1933a, to Bonassa; L. coelorichir (Walker, 1904), to Arugella; L. cubensis (Stebbing, 1897), to Shoemakerella; L. dantvillei Ruffo, 1953b, to Dartenassa; L. dissimilis (Stout, 1913), to Distissimassa; L. eau J.L. Barnard, 1970a, to Arugella; L. falcatula Stephens, 1933a, to Falcanassa; L. falklandica K.H. Barnard, 1932, to Aruga; L. heterodonta (Pirlot, 1936b), to Arugella; L. holmesi (J.L. Barnard, 1955b), to Aruga; L. hummelincki Stephens, 1933a, to Lysianopsis alba; L. hypocrita Ruffo, 1953b, to Phoxostoma; L. indica (Rabindranath, 1971c), to Arugella; L. longicornis Lucas, 1846, to Lysianassina; L. macromera (Shoemaker, 1916), to Macronassa; L. minimina (Schellenberg, 1953), to Proannonyx; L. nasuta Dana, 1853, to Shoemakerella; L. oculata (Humes, 1908), to Aruga; L. pariter J.L. Barnard, 1969a, to Macronassa; L. subantarctica (Schellenberg, 1931), to Lysianassina; L. variegatus (Stimpson, 1856a), to Phoxostoma.


**Habitat and distribution.** Marine, west Norway to Senegal, Mediterranean, Red Sea, South Africa into west Indian Ocean and to Brazil, 0-800 m, 7 species.

**Lysianassina Costa**

(Lysianassina) Costa, 1867: 8.

**Type species.** Lysianax longicornis Lucas, 1846, original designation.

**Diagnosis.** Mouthparts forming quadrate bundle. Labrum and epistome both equally produced, prominent, separate, labrum strongly enlarged, blunted. Incisor ordinary, molar simple, small; conicolaminate, subconical, setulose; palp attached strongly proximal to molar. Inner plate of maxilla 1 not setose; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl well developed. Coxa 1 large and visible, not tapering. Gnathopod 1 short, simple, articles 5 and 6 subequal, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 with notch. Uropod 3 aequiramous, elongate, peduncle elongate, outer ramus 1-articulate. Telson ordinary, entire.

**Additional characters.** Antenna 1 with tooth; outer plate of maxilla 2 narrowed.

**Relationship.** Differing from Lysianassina in the produced epistome.

**Species.** Lysianassina longicornis (Lucas, 1846) (= L. spinicornis Costa, 1853, 1857) (= L. loricata Costa, 1863, 1867) (= L. flicicornis Costa, 1862, 1867) (Chevreux & Fage, 1925) (Krapp-Schickel, 1974) (Ledoyer, 1977) [340 + B].

**Habitat and distribution.** Marine Mediterranean to Red Sea and Indian Ocean, 0-540 m, 1 species.
Lysianella Sars

Fig. 941

Lysianella Sars, 1883: 78.

Type species. Lysianella petalocera Sars, 1883, original designation.

Diagnosis. Mouthparts forming quadrate bundle. Labrum and epistome differentially produced, prominent, separate, labrum strongly dominant in projection, blunt. Incisor ordinary, molar simple, obsolescent, setulose; palp attached strongly proximal to molar. Inner plate of maxilla 1 weakly (2) setose; palp 2-articulate, large. Inner poorly and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl well developed. Coxa 1 large and visible, not tapering. Gnathopod 1 short, strongly subchelate, palm oblique, articles 5 and 6 subequal, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 with large notch(es). Uropod 3 aequiramous, ordinary, peduncle slightly elongate, outer ramus 2-articulate. Telson elongate, entire, (or cleft one fourth).

Additional character. Article 4 of antenna 2 tumid in both sexes.

Sexual dimorphism. Male body smaller and pleon more streamlined; eyes enlarged; primary flagellum on antenna 1 with callynophore; flagellum of antenna 2 elongate; pleopods enlarged.

Variables. Eyes absent (L. mimica); palm of gnathopod 1 weak (L. mimica); pleon 3 produced dorsoposteriorly (L. mimica); notch on inner ramus of uropod 2 weak (L. mimica); telson cleft one fourth (L. dellavallei).

Relationship. Characterised by tumid article 4 on antenna 2 and the subchelate gnathopod 1 (but see L. mimica). From Parawaldeckia in the subequal rami of uropod 3 and the subchelate gnathopod 1. From Paralysianopsis in the better subchelate gnathopod 1 and blunt prebuccal projection (sharp in Paralysianopsis). From Microlysias in the dominant labrum, well-developed dactyl of the maxilliped and the uncelt telson. From Pseudokoroga in the discrete labrum and small hand of gnathopod 1.


Habitat and distribution. Marine, Arctic, Mediterranean, deep sea of South Atlantic, 35-4050 m, 3 species.

Lysianopsis Holmes

Fig. 95C

Lysianopsis Holmes, 1905: 475.

Type species. Lysianopsis alba Holmes, 1905, monotypy.

Diagnosis. Mouthparts forming quadrate bundle. Labrum and epistome differentially produced, prominent, separate, labrum strongly dominant in size and projection, blunt. Incisor ordinary, molar simple, small; conicolaminate, subconical, setulose; palp attached strongly proximal to molar. Inner plate of maxilla 1 weakly (2) setose; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp article 2 slightly exceeding outer plate, dactyl well developed. Coxa 1 large and visible, not tapering. Gnathopod 1 short, simple, articles 5 and 6 subequal, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 with large notch. Uropod 3 short, peduncle expanded, inner ramus slightly shortened, outer ramus 2-articulate. Telson ordinary, entire.

Additional character. Male antenna 2 not elongate (versus Aruga).

Relationship. See Aruga.


Habitat and distribution. Marine, western Atlantic Ocean from Cape Cod to the Caribbean Sea at Curacao, 0-20 m; Campbell Island, 2-23 m; and Magellan area, 11-91 m; 0-91 m; 3 species.

Macronassa n.gen.

Type species. Aruga macromerus Shoemaker, 1916, original designation.

Etymology. Named for roots in Lysianassa and macromerus.

Diagnosis. Mouthparts forming quadrate bundle. Labrum and epistome both produced, prominent, separate, blunt. Incisor ordinary, molar simple, conicolaminate, subconical, setulose; palp attached strongly proximal to molar. Inner plate of maxilla 1 weakly setose; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp strongly
exceeding outer plate, dactyl well developed. Coxa 1 large and visible, not tapering. Gnathopod 1 short, simple, articles 5 and 6 subequal, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 with large notch. Uropod 3 short, peduncle expanded, inner ramus not or slightly shortened, outer ramus 1-articulate. Telson ordinary, entire.

Relationship. Differing from Bonassa, Dartenassa and Phoxostoma in the nonsetose uropod 1. From Lysianassa in the short plate-like peduncle of uropod 3.

Like Arugella, Aruga, Falcanassa, Lysianassa, Lysianopsis and Shoemakerella, but epistome separate, neither labrum nor epistome dominant. Incisor ordinary, molar simple, subconical, smooth; palp attached opposite molar. Inner plate of maxilla 1 weakly (2) setose; some spines on outer plate disjunct; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl small. Coxa 1 large and visible, not tapering. Gnathopod 1 short, strongly subchelate, palm oblique, articles 5 and 6 subequal, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, propodus minutely subchelate, article 7 tiny. Inner ramus of uropod 2 without notch. Telson 3 short, peduncle ordinary, inner ramus slightly shortened, outer ramus 2-articulate. Telson elongate, deeply cleft.

Relationship. Like Centromedon but coxa 1 quadrate, not tapering, and palm of gnathopod well developed. Differing from Rifcus in the deep cleft of the telson, stout gnathopod 1, obsolescent molar and presence of many setae on article 2 of mandibular palp. Differing from Dountaella in the well-setose inner plate of maxilla 2, the oddly armed outer plate of maxilla 1, poorly defined molar, and in the carpus of gnathopod 1 being as long as the propodus. Differing from Uristes in the more strongly reduced molar, smaller dactyl of maxilliped and non-tapering coxa 1.

Species. Martensia martensi (Goes, 1866) (= M. caecus Vosseleer, 1889, fide Olerod, 1980, see Centromedon typhlops) (Steele, 1968) [295].

Habitat and distribution. Marine, Spitzbergen, 37-95 m, 1 species.

Menigrates Boeck
Figs 86E, 89I, 90M, 92U

Menigrates Boeck, 1871b: 113.—Lincoln, 1979a: 92.

Type species. Anonyx obtusifrons Boeck, 1861, monotypy.

Diagnosis. Mouthparts forming quadrate bundle. Labrum and epistome continuous, not differentially produced. Incisor ordinary, molar simple, obsolescent or absent; palp attached slightly proximal to molar (when present). Inner plate of maxilla 1 weakly (2) setose; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl well developed. Coxa 1 large and visible, not tapering. Gnathopod 1 simple, article 5 shorter than 6, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely subchelate, article 7 tiny. Inner ramus of uropod 2 without notch. Uropod 3 short, peduncle ordinary, inner ramus slightly shortened, outer ramus 2-articulate. Telson short, weakly cleft or emarginate.

Additional characters. Peduncular articles 2 and 3 of antenna 1 half or less as long as article 1 (versus Waldeckia and Socarnes); branchiae lacking accessory lobes in type species (versus Waldeckia).

Sexual dimorphism. Flagella of male antennae 1-2 longer than in female and furnished with calceoli.

Variables. Rami of uropod 2 subequal (M. obesum), unequal (M. angustipes).

Relationship. See Paralibrotus and Menigratopsis.


Habitat and distribution. Marine, cold northern seas, 7-200 m, occasionally on or in starfishes, 4 species.
Menigratopsis Dahl


Type species. Menigratopsis svennilssoni Dahl, 1945, monotypy.

Diagnosis. Mouthparts forming quadrate bundle. Labrum and epistome continuous, not differentially produced. Incisor ordinary, molar simple, large, setulose, palp attached opposite molar. Inner plate of maxilla 1 weakly (2) setose; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl well developed. Coxa 1 large and visible, not tapering. Gnathopod 1 simple, article 5 longer than 6, dactyl small; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely subchelate. Inner ramus of uropod 2 without notch. Uropod 3 short, peduncle ordinary, inner ramus slightly shortened, outer ramus 2-articulate. Telson elongate, deeply cleft.

Sexual dimorphism. [Unknown].

Relationship. Differing from Menigrates in the longer and more deeply cleft telson and the short propodus of gnathopod 1.


Habitat and distribution. Marine, The Sound between Denmark and Sweden and Norway and northwest Greenland, 11-210 m, 1 species.

Mesocyclocaris Birstein & Vinogradov

Mesocyclocaris Birstein & Vinogradov, 1964: 156.

Type species. Mesocyclocaris gracilis Birstein & Vinogradov, 1964, monotypy.

Diagnosis. Of cyphocarin form, head tall, horizontally short, grotesque. Flagellum of antenna 2 short (2-articulate); accessory flagellum vestigial, 1-articulate. Mouthparts forming quadrate bundle. Labrum and epistome (?continuous, not differentially produced, neither dominant). Incisor ordinary, rakers present, molar absent; palp attached to middle of mandible. Inner plate of maxilla 1 weakly (3) setose; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp scarcely exceeding outer plate, dactyl well developed. Coxa 1-2 small, strongly shortened and partly covered by coxa 3, coxa 4 narrow, long, weakly lobate and excavate. Gnathopod 1 short, simple, articles 5 and 6 subequal, dactyl large; article 6 of gnathopod 2 slightly shorter than article 5, both very elongate and linear, propodus minutely subchelate. Uropod 3 ordinary, peduncle ordinary, aequiramous, outer ramus 1-articulate. Telson [unknown].

Additional characters. Note calypophore on flagellum of antenna 1 and calceoli; pereopods 3-7 prehensile, hands thickened and spiny, article 5 shortened on pereopods 3-6 [77].

Relationship. Differing from Metacyclocaris in the reduction of coxa 2, the lack of both mandibular palp and accessory flagellum, the reduction of the palp on maxilla 1, the reduction of the inner plate on the maxilliped and the loss of article 2 on the outer ramus of uropod 3.

Species. Mesocyclocaris gracilis Birstein & Vinogradov, 1964 [613B].

Habitat and distribution. Marine, Arabian Sea, bathypelagic, less than 1500 m, 1 species.

Mesocyphocaris Birstein & Vinogradov


Type species. Mesocyphocaris longicaudatus Birstein & Vinogradov, 1960, original designation.

Diagnosis. Of cyphocarin form, head tall, horizontally short, grotesque. Flagellum of antenna 2 short (2-articulate); accessory flagellum vestigial, 1-articulate. Mouthparts forming quadrate bundle. Labrum and epistome (?continuous, not differentially produced, neither dominant). Incisor ordinary, rakers present; molar absent; palp attached to middle of mandible. Inner plate of maxilla 1 weakly (3) setose; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp scarcely exceeding outer plate, dactyl well developed. Coxa 1-2 small, strongly shortened and partly covered by coxa 3, coxa 4 largest, lobate, excavate. Gnathopod 1 short, simple, articles 5 and 6 subequal, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, propodus minutely subchelate. Uropod 3 elongate, peduncle elongate, parviramous, inner ramus strongly shortened, outer ramus 2-articulate. Telson short, weakly cleft.

Additional characters. Pereopods 3-5 and less so pereopod 6 prehensile, hands thickened and spiny, article 5 very short.

Relationship. Mesocyphocaris differs from Paracyphocaris in the short telson, presence of rakers and the elongate uropod 3.
See *Metacyphocaris*, *Crybelocephalus*, *Cyblocyphocaris* and *Cebocaris*.

**Species.** *Mesocyphocaris longicaudatus* Birstein & Vinogradov, 1960, 1964 [600A].

**Habitat and distribution.** Marine, Indo-Pacific, abyssopelagic, less than 3420 m, 1 species.

*Metacyclocaris* Birstein & Vinogradov


**Type species.** *Metacyclocairis polycheles* Birstein & Vinogradov, 1955, original designation.

**Diagnosis.** Of weak cyphocarin form, head tall, horizontally short, grotesque, with hood. Flagella of antennae short (4-articulate); accessory flagellum vestigial, 1-articulate. Mouthparts forming quadrate bundle. Labrum and epistome continuous, not differentially produced, prominent, coalesced, separate, labrum epistome slightly strongly dominant in size, projection, and blunt, sharp. Incisor ordinary, molar simple, small; rakers absent; palp absent. Inner plate of maxilla 1 weakly (2) setose; palp 2-articulate, large. Inner small and outer plate of maxilliped well developed, palp strongly exceeding outer plate, dactyl well developed. Coxae 1-2 small, strongly shortened and partly covered by coxa 2, latter large and visible, not tapering, coxae 3-4 scarcely larger, 4 lobate and excavate. Gnathopod 1 short, simple, articles 5 and 6 subequal, dactyl large; article 6 of gnathopod 2 slightly shorter than article 5, both very elongate and linear, propodus minutely subchelate. Uropod 3 elongate, peduncle elongate, dispiramous, inner ramus slightly shortened, outer ramus 2-articulate. Telson elongate, weakly cleft.

**Additional characters.** Note callynophore on flagellum of antenna 1 and calceolae; large mandibular palp; pereopods 3-7 prehensile, hands thickened and spiny, article 5 shortened on pereopods 3-6, pereopod 7 scarcely modified in either respect.

**Relationship.** *Metacyclocairis* has more plesiomorphic characters than any other cyphocarid because only coxa 1 is reduced, the mandibular palp is present and well setose, the accessory flagellum is long, the maxillae are well setose, the telson is elongate and deeply cleft, article 2 of pereopods 5-7 is well expanded and uropod 3 is relatively close to the aequiramous condition. A few raker spines remain but the molar is absent, unlike *Cypycarid*.

See *Cyclocaris*, *Crybelocephalus* and *Mesocyphocaris*.

**Species.** *Metacyclocairis polycheles* Birstein & Vinogradov, 1955, 1958 (Garjanova, 1962) [280B].

**Habitat and distribution.** Marine, Kurie-Kamchatka Trench region, bathypelagic, less than 1800 m, 1 species.

*Metacyphocaris Tattersall, 1906: 29.*

**Type species.** *Metacyphocaris helgae* Tattersall, 1906, original designation.

**Diagnosis.** Of cyphocarin form, head tall, horizontally short, grotesque, with hood. Flagella of antennae short (4-articulate); accessory flagellum vestigial, 1-articulate. Mouthparts forming quadrate bundle. Labrum and epistome continuous, not differentially produced, prominent, coalesced, separate, labrum epistome slightly strongly dominant in size, projection, and blunt, sharp. Incisor ordinary, molar simple, small; rakers absent; palp absent. Inner plate of maxilla 1 weakly (2) setose; palp 2-articulate, large. Inner small and outer plate of maxilliped well developed, palp strongly exceeding outer plate, dactyl well developed. Coxae 1-2 small, strongly shortened and partly covered by coxa 3, coxa 4 largest, lobate, excavation weak. Gnathopod 1 short, nearly simple, articles 5 and 6 subequal, dactyl medium; article 6 of gnathopod 2 greatly shorter than article 5, propodus simple. Uropod 3 ordinary, peduncle ordinary, parviramous, inner ramus strongly shortened, outer ramus 2-articulate. Telson elongate, weakly cleft.

**Additional characters.** Pereopods 3-5 prehensile, article 4 shortened, hands thick and spiny, pereopods 6-7 increasingly elongate and simple; article 2 of pereopods 5-7 expanded (versus *Crybelocephalus*).

**Relationship.** *Metacyphocaris* differs from *Paracyphocaris* in the absence of mandibular palp and the poorly cleft telson.

Differing from *Mesocyphocaris* in the absence of mandibular palp and the elongation of the telson.

See *Metacyclocairis*, *Crybelocephalus*, *Cyblocyphocaris* and *Cebocaris*.


**Habitat and distribution.** Marine, cosmopolitam, bathypelagic, possibly abyssopelagic, confirmed 600-1200 m, 1 species.
**Metambasia** Stephensen

*Metambasia* Stephensen, 1923b: 76.

**Type species.** *Metambasia faeroensis* Stephensen, 1923b, monotypy.

**Diagnosis.** Mouthparts forming quadrate bundle. Labrum and epistome differentially produced, not prominent, separate, labrum slightly dominant in size and projection, blunt. Incisor ordinary, molar simple, small, conicolaminate, setulose; palp attached opposite molar. Inner plate of maxilla 1 weakly (2) setose; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl well developed. Coxa 1 large and visible, not tapering. Gnathopod 1 short, strongly subchelate, palm transverse, article 5 shorter than 6, lobate, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 without notch. Uropod 3 ordinary, peduncle slightly elongate, inner ramus slightly shortened, outer ramus 2-articulate. Telson elongate, deeply cleft.

**Sexual dimorphism.** Male with calceoli, antenna 2 flagellum elongate, articles 4-5 of peduncle short and weakly inflated, with anterior male tufts, article 3 very stout; uropod 3 elongate and setose.

**Relationship.** Differing from *Schisturella* and *Ambasiopsis* in the fully simple gnathopod 1. From *Parschisturella* in the short, blunt labral lobe, the presence of only 2 setae on inner plate of maxilla 1, and the very reduced coxa 1.

**Species.** *Metambasia faeroensis* Stephensen, 1923b [209B].

**Habitat and distribution.** Marine, south-west of Faeroes Islands, 835-900 m, 1 species.

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**Microlysias** Stebbing

*Microlysias* Stebbing, 1918: 63.

**Type species.** *Microlysias xenokeras* Stebbing, 1918, monotypy.

**Diagnosis.** Mouthparts forming quadrate bundle. Labrum and epistome ['continuous, not differentially produced, not prominent, coalesced, blunt]. Incisor ordinary, molar simple, small; subconical; palp attached strongly proximal to molar. Inner plate of maxilla 1, naked; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl well developed. Coxa 1 large and visible, not tapering. Gnathopod 1 short, strongly subchelate, palm transverse, article 5 shorter than 6, lobate, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 without notch. Uropod 3 ordinary, peduncle slightly elongate, inner ramus slightly shortened, outer ramus 2-articulate. Telson elongate, deeply cleft.

**Additional characters.** Head large, subglobose, lacking rostrum, lateral lobes or sinus for antenna 1; article 1 of mandibular palp slightly elongate; branchiae pleated.

**Sexual dimorphism.** Female antenna 2 ordinary, though article 3 elongate; male peduncle of antenna 2 with articles 1-4 short, bead-like, article 5 swollen, enlarged, flagellum thin, elongate, in terminal male articles = 60+, bead-like, meandering; in young male, article 1 of flagellum long, cone-like, tipped with about 5 short articles.

**Relationship.** Differing from *Orchomene* in the peculiar male antenna 2. From *Lysianella* in article 5, not 4, of antenna 2 in male being tumid, and the elongate deeply cleft telson.


**Species.** *Microlysias xenokeras* Stebbing, 1918 (= *M. indica* K.H. Barnard, 1937) (not K.H. Barnard, 1940) (Griffiths, 1975) [690I].

**Habitat and distribution.** Marine, South Africa to South Arabian coast, 4 m, 1 species.

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**Nannonyx** Sars

*Figs 89R, 90X, 91K, 92W, 95F*

*Nannonyx* Sars, 1895: 71.—Lincoln, 1979a: 64.

**Type species.** *Orchomene goesii* Boeck, 1871, monotypy.

**Diagnosis.** Mouthparts forming quadrate bundle, some styliform. Labrum and epistome ['continuous, not differentially produced, not prominent, coalesced, blunt]. Incisor ordinary, molar simple, small; subconical; palp attached strongly proximal to molar. Inner plate of maxilla 1, naked; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl small to vestigial. Coxa 1
large and visible, not tapering. Gnathopod 1 short, thick, nearly simple, palm when present transverse, articles 5 and 6 subequal, 5 lobate, dactyl small; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 without notch. Uropod 3 short, peduncle short, expanded, inner ramus strongly shortened, outer ramus 2-articulate. Telson ordinary, entire (type) or emarginate.

Additional characters. Following parts styliform; inner plate of maxilla 1, both plates of maxilla 2, apical part of inner plate of maxilliped, but base of inner plate broadly lobate and setose (type only); gnathopod 1 very thick; peduncle of uropod 3 expanded and plate-like, rami shorter than peduncle.

Variables. Gnathopod 1 palm obsolescent (N. propinquus); inner ramus of uropod 3 vestigial (N. reductus).

Relationship. Characterised by small uropod 3 with short rami and plate-like peduncle, large coxa 1, thick gnathopod 1, certain thin plates of maxilla 1, maxilla 2, maxilliped, and vestigial maxilliped dactyl.

Differing from Lysianassa in amalgamated prebuccal mass and vestigial maxilliped dactyl. From Parambassia in the thick gnathopod 1, reduced uropod 3 and weak maxilliped dactyl. From Pseudambassia in the thin plates of maxilla 2, and the reduced uropod 3. From Perrierella in the proximal mandibular palp, thin inner plate of maxilla 1 and thin inner and outer plates of maxilla 2, presence of long inner plate of maxilliped, plate-like peduncle of uropod 3, and large coxa 1. From Normanion in the subsimple gnathopod 1, lack of thin lobe on the carpus of gnathopod 1, small uropod 3, and longer maxilliped palp. From Menigrates in the proximal mandibular palp, small uropod 3, and vestigial dactyl of the maxilliped. From Paralyssanops in the unproduced prebuccal mass, simple inner ramus of uropod 2, shorter rami of uropod 3, and proximal mandibular palp. From Boeckosimus and Onisimus in the proximal mandibular palp, very thin inner plate of maxilla 1 and thick iner and outer plates of maxilla 2, and reduced uropod 3. From Ricus in proximal mandibular palp, uncial telson, plate-like peduncle of uropod 3, and thick gnathopod 1. From Paranisonisimus in the proximal mandibular palp, reduced maxilliped dactyl, and uncial short telson. From Parawalis in the reduced dactyl of the maxilliped, and the thinness of the plates on maxillae 1 and 2 and the thin inner plate of the maxilliped.

Close to, but different from Paralibrotus in the proximal mandibular palp, and reduced dactyl of the maxilliped.


Species. See Chevreux & Fage (1925); Lincoln (1979a); N. goessi Boeck, 1871b (Sars, 1895) (Gurjanova, 1951) [216]; N. propinquus Chevreux, 1911d (MacQuart-Moulin, 1968) [340]; N. reductus Greze, 1975 [334]; N. spinimanus Walker, 1895b (Lincoln, 1979a) [239 + 242].

Habitat and distribution. Marine, Barents Sea around eastern North Atlantic into Black Sea, 0-75 m, 4 species.


Type species. Opis quadrimana Bate & Westwood, 1868, monotypy.

Diagnosis. Mouthparts forming slightly conical bundle, weakly styliform. Labrum and epistome continuous, not differentially produced, coalescent, blunt. Incisor ordinary, molar simple, small, conicolaminate, setulose; palp attached strongly proximal to molar. Inner plate of maxilla 1 weakly (2) setose; palp 2-articulate, large. Inner poorly and outer plates of maxilliped well developed, palp not or scarcely exceeding outer plate, dactyl vestigial. Coxa 1 scarcely shortened and weakly covered by coxa 2, mostly large and visible, scarcely tapering. Gnathopod 1 enlarged, strongly subchelate, palm transverse, but weakly chelate at corner, article 5 shorter than 6, lobate, eustrid, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 without notch. Uropod 3 aequiramous, peduncle elongate, outer ramus 1-articulate. Telson ordinary, entire.

Additional characters. Palp of maxilliped very short; article 3 of gnathopod 1 slightly elongate, carpus of eusirid form; gills occasionally pleated.

Variables. Outer plate of maxilliped much smaller than type (N. abyssi), palp slightly exceeding outer plate (N. abyssi), dactyl vestigial (N. abyssi); palm of gnathopod 1 denticulate (N. quadrimana), or not (N. amblyops, etc.); carpus of gnathopod 2 not lobate (N. abyssi).

Relationship. Characterised by the aequiramous uropod 3 with elongate peduncle, with 1-articulate outer ramus, and the short palp of the maxilliped.

Differing from Opis in the poorly chelate gnathopod 1, short palp of maxilliped and uncial telson. From Cheirimedon in the eusirid wrist of gnathopod 1, uncial telson and short palp of the maxilliped. From Koroga in the short palp of the maxilliped, eusirid carpus of
gnathopod 1, antennal notch on head, subequal rami of uropod 3 and the 1-articulate outer ramus of uropod 3. From Kyska in the proximal placement of the mandibular palp, nonchelate gnathopod 1 and unclef telson.

See Podoprinella and Trischizostoma.

**Species.** See Ledoyer (1977); *N. abyssi* Chevreux, 1903, 1935 [302A]; *N. amblyops* Sars, 1895 [238BI]; *N. quadrimanus* (Bate & Westwood, 1868) (Lincoln, 1979a, part) [239]; *N. sarsi* Stebbing, 1906 (= *N. quadrimanus* identification of Sars, 1895, not Bate & Westwood, 1868) (Stephensen, 1928) (Ledoyer, 1977) [355 + B + I]; species 1 (Mediterranean *N. quadrimanus*, see Ledoyer, 1977) (Chevreux, 1920) [330]; species 2 (Naples, see Ledoyer, 1977) [348].

**Habitat and distribution.** Marine, boreal and warm-temperate north-eastern Atlantic and Mediterranean, and 1 abyssal species in Mediterranean, often parasitic on skin of fishes, 20-2368 m, 4 species.

**Additional characters.** Body posteriorly carinate and toothed; head mostly hidden by coxa 1; article 1 of antenna 1 crested; accessory flagellum vestigial; rakers present; article 5 of pereopods 3-7 very short; article 4 of only pereopods 5-6 broadly expanded; telson strongly setospinose apically.

**Sexual dimorphism.** Females with pubescent body, males lacking such pubescence; male mandibular incisor reduced and sharpened; maxillae degenerate and outer plate of maxilliped reduced; inner rami of uropods 1-2 larger in male than in female; carinae of pereon 7 and pleonites 1-2 reduced. *Fresnillio fimbriatus* thus secondary male of female described as *Ocosingo borlus*.

**Variables.** Uropods 1-2 uniramous (*O. fenwicki*).

**Relationship.** Differing from *Acontiostoma* and *Stomacrea* in the strongly reduced inner rami of uropods 1-2 and the loss of dactyl on gnathopod 2. From *Conicostoma* in the loss of rami on uropod 3 and, the unnotched telson.

**Species.** *Ocosingo borlus* J.L. Barnard, 1964b (= *F. fimbriatus* J.L. Barnard, 1969a) [370]; *O. fenwicki* Lowry & Stoddart, 1984b [774].

**Habitat and distribution.** Marine, Carmel California to Bahia San Ramon, Mexico; New Zealand; 0-11 m, 1 species.

**Onesimoides** Stebbing

**Additional characters.** Basal article of accessory flagellum elongate, flattened or cristate; posteroventral lobe of coxa 4 weak (versus *Clepidicerella*).

**Variables.** Body carinate (*O. carinatus*), weakly or not (others); molar somewhat reduced (*O. chelatus*); gnathopod 1 enlarged more than type and palm oblique and sculptured (*O. cavimanus*), thin, slightly chelate, with article 5 poorly lobate and slightly elongate (*O. chelatus, O. mediterraneus*); peduncle of uropod 3 plate-like (*O. carinatus*).
cavimanus, O. mediterraneus), weakly (O. chelatus), inner ramus one third as long as outer (O. mediterraneus), half as long as outer (O. mediterraneus).

Relationship. Differing from Cleopidecrilla in the small lobe of coxa 4, subchelate gnathopod 1 and well-developed plates of the maxillipeds. From Korogia in the smaller inner ramus of uropod 3, short telson and small head.

Like Pseudambasia (not Parambasia), but inner ramus of uropod 3 very short, inner ramus of uropod 2 without significant notch, epistome not dominant, lobe of coxa 4 weak, and basal article of accessory flagellum widened and elongate.

See Paronesimoides.


Habitat and distribution. Marine, Mediterranean, South Atlantic, Indian and south-west Pacific Oceans, bathyal and abyssal, 1264-4940 m, 4 species.

Onisimus Boeck (= Pseudalihrotus Della Valle)


Type species. Anonyx litoralis Boeck, 1871b, selected by Boeck, 1876.

Diagnosis. Mouthparts forming quadrate bundle. Labrum and epistome continuous, differentially produced, coalesced, epistome slightly dominant in projection and blunt. Incisor ordinary, molar triturative, large, palp attached opposite molar. Inner plate of maxilla 1 weakly (2) setose; palp 2-articulate, large. Both plates of maxilla 2 medially setose. Inner and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl well developed. Coxa 1 large and visible, not tapering. Gnathopod 1 slightly enlarged, strongly subchelate, palm oblique, articles 5 and 6 subequal, article 5 lobate, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely chelate (or not). Inner ramus of uropod 2 with or without notch. Uropod 3 ordinary, peduncle ordinary, inner ramus slightly shortened, outer ramus 2-articulate (type) or 1-articulate. Telson short, entire.

Sexual dimorphism. Male flagella of antennae 1-2 elongate and calceoliferous, article 1 on primary flagellum of antenna 1 slightly elongate and more bushy; peduncle of antenna 2 with anterior male tufts.

Variables. Gnathopod 2 not chelate (O. nanseni); inner ramus of uropod 2 lacking notch (O. caspius, O. glacialis, O. platyceras); rami of uropod 3 almost naked to moderately spinose and setose; outer ramus of third uropod 1-articulate (O. birinal, O. caspius, O. platyceras).

Relationship. Not very distinct from Boeckosimus but latter always with weakly cleft telson and dominant labral part of prebuccal complex.

See Rifcus.

Distribution notes. In the Arctic Ocean considered also as epipelagic, occurring also under central arctic ice canopy (O. nanseni); comes to bait; many arctic records deeper than 150 m expunged as specimens probably caught in shallower waters during trawl recovery.

Species. See Bushueva, 1977; Dunbar, 1954; Gurjanova, 1951, 1962; Holmquist, 1965; Schellenberg, 1927; Stephensen, 1923b (key), 1929, 1933b, 1935a, 1940b, 1944a; Shoemaker, 1955a; O. caspius (Sars, 1896) (Gurjanova, 1951) (Birstein & Romanova, 1968) [332 + B]; O. glacialis (Sars, 1900) (J.L. Barnard, 1959) (Holmquist, 1965, 1975) (Just, 1970) [220]; O. litoralis (Krayer, 1845, 1846a,b) (Sars, 1895) (Holmquist, 1965) (= O. birinal Gurjanova, 1929b, 1962) [220]; O. nanseni (Sars, 1900) (J.L. Barnard, 1959) [220]; O. platyceras (Sars, 1896) (Birstein & Romanova, 1968) [332]; O. zenkevitchi Mednikov, 1960 [278].

Habitat and distribution. Marine and Ponto-Caspian, mostly arctic, circumpolar, often in very diluted seawater, ocean = 0-100 m (mostly shallow); Caspian Sea, about 25-140 m, 6 species.

Opisa Boeck

Figs 90Q, 92G, 950

Opisa Krayer, 1842: 149 (homonym, Mollusca).
Opisa Boeck, 1876: 190 (new name).-Lincoln, 1979a: 48.

Type species. Opis eschrichtii Krayer, 1842, monotypy.

Diagnosis. Mouthparts forming quadrate bundle. Labrum and epistome differentially produced, not prominent, separate, labrum slightly dominant in size and projection, blunt. Incisor ordinary, molar obsolete or absent, setulose, palp attached slightly proximal. Inner plate of maxilla 1 weakly (2) setose; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp slightly exceeding outer plate, dactyl well developed. Coxa 1 slightly to strongly shortened and partly covered by coxa 2, tapering. Gnathopod 1 strongly enlarged, strongly chelate, article 5 much shorter than 6, eusirid, weakly lobate, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary,
propodus subchelate. Inner ramus of uropod 2 without notch. Uropod 3 ordinary, peduncle slightly elongate, inner ramus slightly shortest, outer ramus 2-articulate. Telson very elongate, deeply cleft.

Additional characters. Carpus of gnathopod 2 short, weakly lobate and eusirid, thus hand reversible, chela with large gap.

Sexual dimorphism. Male antenna 1 with article 1 of primary flagellum more elongate and brushy, articles 4-5 of peduncle on antenna 2 strongly brushy anteriorly, flagellum elongate and calceolate.

Variable. Ocular lobes sharp (O. tridentata).

Relationship. Differing from Podoprinella in the elongate cleft telson, normal maxillipeds and lack of posterior teeth on article 2 of pereopod 5. From Trischizostoma in the elongate cleft telson, ordinary mouthparts and regular coxae 2-4. From Koroga in the reduced coxa 1 and elongate coxal telson. From Euonyx in the broad chela of gnathopod 1 and unproduced epistome. From Cheirimedon in the chelate condition of gnathopod 1 and the eusirid wrist.

Species. See Shoemaker (1930a); Stephensen (1923b, 1935a); O. eschrichti (Kroyer, 1842) (= O. typica Kroyer, 1844b) (Sars, 1895) (Gurjanova, 1962) (Lincoln, 1979a) [2001]; O. tridentata Hurley, 1963 (J.L. Barnard, 1966a,b) [373].

Habitat and distribution. Marine, circumpolar and boreal south to California, Korea and British Isles, 30-432 m. Possibly parasitic on fishes, 2 species.

**Super genus Orchomene** Boeck
Figs 89C,E,H,Q, 90L, 91C, 92D, 95V

*Orchomene* Boeck, 1871b: 114.-Lincoln, 1979a: 68. [Valid genus.]

*Tryphosa* Boeck. 1871b: 117 (Anonyx nanus Kroyer, 1846, selected by Boeck, 1876).

*Orchomenella* Sars, 1895; 66 (Anonyx minutus Kroyer, 1846b, original designation). [Valid genus.]

*Orchomenopsis* Sars, 1895; 73 (Orchomenopsis obtusa Sars, 1895, monotypy). [Valid subgenus of Orchomenella.]

*?Allogaussia* Schellenberg, 1926a: 245 (Allogaussia paradoxa Schellenberg, 1926a, selected by Stasek, 1938). [Valid genus.]

*(Orchomexy)* De Broyer, 1984: 198 (Orchomenella macronyx Chevreux, 1905d, original designation). [Valid subgenus of Orchomenopsis.]

*Abyssorchomene* De Broyer, 1984: 198 (Orchomenella chevreuxi Stebbing, 1906, original designation). [Valid genus.]

Type species. *Anonyx serratus* Boeck, 1861, selected by Boeck, 1876.

**Classification.** This complex of genera is being worked out slowly in the 1980's but is too difficult to treat in more than a superficial way until all of the species have been allocated to their proper genera by the taxonomists engaged in the study. If we allocated to their genera various species that have been studied adequately, a pool of taxa would still remain that would have to be 'dumped' into *Orchomene*. The species are divided into genera on the basis of extremely small characters that we have not yet been able to use adequately even on preserved specimens. We prefer therefore to leave these taxa together under *Orchomene*.

A summary of the sketchy details of the taxa are as follows: *Orchomene* with mandibular molar in the form of a crest or comb bearing cusps, denticles and 'setae' (actually pubescence), outer plate of maxilliped without 2 strong apical spines; *Orchomenopsis* with mandibular molar button shaped (truncated cylinder) and armed with denticles and cusps but no pubescence, outer plate of maxilliped with 2 strong apical spines; this is divided into subgenus *Orchomenella* with carpal lobe broad and propodus not excavating along posterior margin; subgenus *Orchomenopsis* with carpal lobe thinner and propodus with excavate posterior margin; *Abyssorchomene* with molar like *Orchomene*, maxilliped like *Orchomenella* and gnathopod 1 like *Orchomenopsis*; *Allogaussia* differing from above genera in lack of coxal gill 7, grotesquely enlarged basis of pereopod 5, unclef telson and an 'elongate' peduncle of antenna 1. We find some of these characters very difficult to evaluate and await further clarification.

**Diagnosis.** Mouthparts forming quadrate bundle. Labrum and epistome typically differentially produced, prominent, separate, usually epistome slightly to strongly dominant in size and projection, blunt. Incisor ordinary; molar weakly triturative or simple, medium to small, occasionally conicolaminate or subconical, setulose, palp attached strongly proximal to molar. Inner plate of maxilla 1 weakly setose; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp slightly exceeding outer plate; dactyl well developed. Coxa 1 large and visible, not tapering. Gnathopod 1 subchelate, palm oblique to transverse, articles 5 and 6 subequal, or 5 shorter than 6, dactyl medium; article 6 of gnathopod 2 shorter than article 5, ordinary, propodus minutely subchelate. Inner ramus of uropod 2 without notch. Uropod 3 ordinary, peduncle ordinary, inner ramus slightly shortened, outer ramus 2-articulate. Telson ordinary, weakly to deeply (type) cleft or emarginate or entire.

**Sexual dimorphism.** Male eyes enlarged, antenna 1 stouter and more strongly armed, antenna 2 elongate, flagellum calceolate, urosomite 1 often more strongly humped and notched dorsally, rami of uropod 3 more subequal and more setose, article 2 on outer ramus often obsolescent to absent.
Variables. Primary flagellum with callynophore and usually article 1 of accessory flagellum elongate in both sexes (but scarcely so in O. pelagica) (not in O. franklini, etc.).

Epistome triangularly produced (O. oxystoma is this Tryphosites?); epistome and upper lip not differentially produced (O. chilensis, O. pinguis, etc.), upper lip dominant (O. rossi, etc.), weakly so (O. holmesi), epistome dominant (O. minuta, O. serrata, etc.), epistome large and nasiform but poorly separated from labrum (O. batei).

Molar more or less universal, triturative and symmetrical (O. goniops, O. chelipes) to setulose and conicolamate, thus asymmetrical (O. obtusus), kernelled and furnished strongly with pubescence between rakers and molar (for example, O. crispa, O. amblyops, O. pectinata), not so (O. nana). Article 1 of mandibular palp elongate (O. magadalensis); palp strongly proximal to molar (European species, especially O. serrata, O. crispa, O. humilis, O. pectinata, also O. chilensis), poorly proximal (O. hureaui, O. chelipes, O. goniops, O. ples). Inner plate of maxilla 1 with 2 + 2 setae (O. hureaui); spines on outer plate reduced and fused together or broadened (O. arnaudi, etc.). Coxa 1 geniculate forward (O. lobata and some specimens of O. nana); coxa 1 tapering distally (O. goniops, O. crenata, O. pinguides, etc.), slightly bevelled (O. littoralis, O. chelipes, O. tabarini), expanded apically (O. plebs, etc.).

Gnathopod 1 weakly chelate (O. charcoti, O. chelipes, O. recondita, etc.); article 3 elongate (O. plicata); article 5 very short but with long lobe (O. plicata) or with long lobe only (O. rotundifrons, O. pelagica, O. obtusa, etc.), less lobe (O. minuta). Article 2 of pereopod 5 grotesquely lobate (Allogaussia, for example O. paradoxa, O. pinguides, etc.); article 2 of pereopods 5–7 generally diverse. Epimeron 3 smooth or serrate. Outer ram of uropods 1–2 often slightly shortened, or inner ramus shortened (O. littoralis); peduncle of uropod 3 plate-like (O. franklini, O. grimaldii, etc.), or not (O. rossi, etc.); inner ramus of uropod 3 significantly reduced (O. grimaldii). Telson cleft (typical) to entire (Allogaussia, for example O. goniops), or barely cleft and emarginate (O. grimaldii and O. chelipes); telson elongate (O. abyssorum).

Relationship. Differing from Tryphosites in the un-notched inner ramus of uropod 2 and the shorter carpus of gnathopod 1 which is shorter than the propodus.

Orchomene oxystoma has a sharp protruding epistome like Tryphosites but is distinguished by the above differences. From Uristes and Tryphosella in the larger head and non-tapering, unreduced coxa 1.

Merging with Lepidepecreum but distinguished by the lack of carinations on antenna 1.

See Downiaella and Gronella.


Species. See K.H. Barnard (1932); Bellan-Santini (1972a,b); Chevreux & Fage (1925); Gurjanova (1951, 1962); Hurley (1963); Karaman (1973h); Krapp-Schickel (1974); Ledoyer (1977); Nicholls (1938); Olerod (1975, mouthparts); Reid (1951); Schellenberg (1925a, 1926a, 1942); Shoemaker (1920a, 1930a,b, 1955a); Stephensen (1923a,b, 1925a, 1928, 1929, 1935a, 1944a); A. aahu Lowry & Stoddart, 1983a [776a]; O. abyssorum Stebbing, 1888 (Nicholls, 1938) (Birstein & Vinogradov, 1960, 1962b, 1964) [420BAV]; O. acanthurus (Schellenberg, 1931) (Shoemaker, 1945d) (Thurston, 1974a) (De Broyer, 1985b) [870]; O. amblyops Sars, 1895 (Stephensen, 1935a) (Gurjanova, 1951) [216B]; O. anaquaeus J.L. Barnard, 1964e [373]; O. annulatus (Bate, 1862) (Steele, 1969) (but see Gurjanova, 1962 as Lepidepecreum) [395]; O. arnaudi Bellan-Santini, 1972b [870]; O. breviceps Hirayama, 1986b [391]; O. cavimanus Stebbing, 1888 (J.L. Barnard, 1961a) (Bellan-Santini, 1972a,b) (Thurston, 1979) (Andres, 1983); O. c. rostratus Schellenberg, 1931 [800BAV + 703]; O. charcoti (Chevreux, 1912a,d) (K.H. Barnard, 1932) (Schellenberg, 1931) [870]; O. chelipes (Walker, 1906b, 1907) (De Broyer, 1975a) [881]; O. chevreuxii (Steebing, 1906) (= O. excavata Chevreux, 1903, homonym) (valid despite J.L. Barnard, 1961a) [304A]; O. chilensis (Heller, 1868a) (Schellenberg, 1931, part) (Hurley, 1965b) [765]; O. commensalis (Chevreux & Fage, 1925) [?353]; O. crenatus (Chevreux & Fage, 1925) (Reid, 1951) [330]; O. crispatus (Goes, 1866) (Sars, 1895) (Gurjanova, 1951) [240 + B]; O. decipiens (Hurley, 1963) (J.L. Barnard, 1966a,b, 1971b) [379 + B]; O. depressus Shoemaker, 1930b [254]; O. dilatatus (Chevreux, 1903, 1935) [302A]; O. distinctus (Birstein & Vinogradov, 1960) [531A]; O. faeroensis Stephensen, 1923b [209B]; O. franklini (Walker, 1903) (= O. littoralis Schellenberg, 1926a) [Allogaussia]; O. galeatus (Schellenberg, 1926a) [Allogaussia] [881]; O. geraldicoris Shulenberg & Barnard, 1976 (= O. affinis identification of Birstein & Vinogradov, 1955) (Thurston, 1979) [422A]; O. glabrus (Lagardere, 1968) [295]; O. goniops Walker, 1906b, 1907 (De Broyer, 1975a) [876]; O. grimaldii Chevreux, 1890a (Karaman, 1973b) [340 + B]; O. guillei De Broyer, 1985a [851]; O. hansenii Meinert, 1893 (= O. melanophthalmus Norman, 1867b) (Sars, 1895) (Stephensen, 1923a) [240]; O. hiaa Andres, 1983 [870, 875 + B]; O. holmesi (Hurley, 1963) [369 + B]; O. humilis (Costa, 1853, 1857) (= O. goesi Della Valle, 1893) (= O. batei Sars, 1883, 1895, Gurjanova, 1951) (Bellan-Santini, 1984) (Lincoln, 1979a) [352BA]; O. hureaui De Broyer, 1973 [878]; O. indicus (Giles, 1890) (see O. mantarensis [664]; O. intermedius (Gurjanova, 1962) [389]; O. japonicus (Gurjanova, 1962) (Kudrjaschov, 1972) [389]; O. kryptopinguides Andres, 1983[871]; O. laevipes Stephensen, 1923b [209B]; O. lepidulus (Gurjanova, 1962) (Bryazgin, 1974a) [280 + B]; O. limodes Meador & Present, 1985 [373]; O. liomargo Hirayama, 1986b [391]; O. lobatus (Chevreux, 1907b, 1935) (Stephensen, 1935a) (Gurjanova, 1951) [295 + B]; O. macronyx (Chevreux, 1905d, 1906a) (Bellan-Santini, 1972b) (Thurston, 1972)
[801]; *O. macrophthalmus* (Birstein & Vinogradov, 1962b) [Allogaussia] [806B]; *O. macroseratus* Shoemaker, 1930b (Dunbar, 1954) (Gurjanova, 1962) (Bryazgin, 1974a) [200]; *O. magdalensis* (Shoemaker, 1942) (J.L. Barnard, 1946a, 1969a, b) [370]; *O. manna renensis* (Rabindranath, 1971c) (=*Anonyx indicus* Giles, 1890) [664]; *O. massiliensis* Ledoyer, 1977 [348 + B]; *O. melanopthalmus* (Gurjanova, 1962) [not *O. melanopthalmus* Norman, see H. hansenii] [286]; *O. minor* Bulychyev, 1952 (Gurjanova, 1962) (Kudrjaschov & Zvyagintsev, 1975) [389]; *O. minor* (Gurianova, 1951) (Tomiokaensis Hirayama, 1986) [395]; *O. paradoxa* (Schellenberg, 1926b) [Allogaussia] [881]; *O. pectinatus* Sars, 1883, 1895 (Gurjanova, 1951) [200 + B]; *O. pelagicus* (Birstein & Vinogradov, 1960) [523AP]; *O. pinguisides* Walker, 1903) [Allogaussia] (= *O. lobata* K.H. Barnard, 1932) (Hurley, 1965a) (Andres, 1986) [870 + B]; *O. pinguisides* (Boeck, 186a) (Sars, 1895) (Bousfield, 1973) [200 + B]; *O. piebs* (Hurley, 1965c) (Bellan-Santini, 1972b) (Thurston, 1974a) (A. andres, 1983) [870 + B]; *O. pilcatus* (Schellenberg, 1926a) (=*O. chilenien* identification of Schellenberg, 1925a) (Griffiths, 1973, 1974a,c) (1975) (Ledoyer, 1986) [745]; *O. proximus* (Chevreux, 1903, 1905) [401B]; *O. reconditus* (Stasek, 1958) [Allogaussia] [371]; *O. rossi* (Walker, 1903) (Hurley, 1965a) (Andres, 1979b, 1983) [870 + B]; *O. rotundifrons* (K.H. Barnard, 1932) (Thurston, 1974a,b) [870]; *O. schellenbergi* Thurston, 1972 [833]; *O. scoticennatis* Andres, 1983 [871 + B]; *O. serratus* (Boeck, 1961) (Sars, 1895) (Vader, 1969a) [200 + B]; *O. sibirjakovi* Gurjanova, 1951 [212A]; *O. similis* Chevreux, 1912c (Chevreux & Fage, 1925) (Toulmond, 1964) [242]; *O. tabarinii* Thurston, 1972, 1974a) (Andres, 1979b, 1983a) [875]; *O. tabasco* J.L. Barnard, 1967a [309B]; *O. thorii* Stephensen, 1923b [209B]; *O. tickoacensia* Hirayama, 1986b [391]; *O. triangulus* (Stephensen, 1925a) (Gurjanova, 1951) [253]; *O. tschernyschevi* Bruggen, 1909 (Stephensen, 1935a) (Gurjanova, 1951) [216 + 280]; *O. ultimus* Bellan- Santini, 1972b [878]; *O. zschauii* (Pfeffer, 1888) (Schellenberg, 1931) (K.H. Barnard, 1932) (Stephensen, 1938c) (Andres, 1983a) [833 + B]; spp., (Sowinsky, 1898) [334]; *O. affinis* identification of Sivaprasakasam, 1968a [664].

**Habitat and distribution.** Marine, cosmopolitan, but mostly cold or deep water, rare in shallow tropics, occasionally inquilinous, 0-9938 m, 85 species.

**Pachychelium** Stephensen

Figs 87B, 92Q

**Pachychelium** Stephensen, 1925a: 121.

**Type species.** *P. davidis* Stephensen, 1925a, original designation.

**Diagnosis.** Of pachyin form. Mouthparts [unknown in type species] forming quadrilater bundle, some reduced. Labrum and epistome separate, blunt. Incisor ordinary, molar absent; palp attached strongly distal. Inner plate of maxilla 1 tiny, weakly (0) setose; palp absent. Inner absent, and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl well developed. Coxa 1 large and visible, not tapering. Gnathopod 1 strongly enlarged, strongly subchelate, palm oblique, not chelate, article 5 shorter than 6, vestigial, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely subchelate, article 7 vestigial. Inner ramus of uropod 2 without notch. Uropod 3 short, peduncle ordinary, inner ramus slightly shortened, outer ramus 2-articulate. Telson ordinary, entire.

**Additional characters.** Base of flagellum on antenna 1 with callynophore; mandible lacking rakers and lacinia mobilis; spines on outer plate of maxilla 1 simple, 4-6, 3 of these vestigial; maxilla 2 with 2 fused vestigial plates, inner very short; posteroventral lobe of coxa 4 poorly developed or absent; article 5 of gnathopod 1 vestigial, 4 reduced, article 3 elongate, palm lacking defining spine, with or without tooth; dactyl of gnathopod 2 vestigial; pereonite 5 (? lacking dorsal tooth).

**Variables.** Gnathopod 1 palm defined by tooth (*P. antarcticum*, *P. schellenbergi*), no (*P. davidis*); maxilliped palp 3 (*P. antarcticum*, *P. davidis*), 4 (*P. schellenbergi*, *P. nicholisi*).

**Relationship.** Very advanced; differing from *Ekelofia* in the loss of defined spine on gnathopod 1, loss of rakers, loss of lobe on coxa 4, and loss of expansion on article 4 of pereopods 5-6.

Differing from *Pachynus* in the absence of both the palp of maxilla 1 and the inner plate of the maxillipeds, the vestigial maxilla 2, in the non-chelate gnathopod 2, elongate article 1 on the primary flagellum of antenna 1 and the poorly developed coxa 4. From *Prachynella* in the elongate article 1 of the primary flagellum on antenna 1, lack of inner plate and long palp of the maxilliped, the non-chelate gnathopod 1 and poorly developed coxa 4. From *Acheronia* in the loss of palp on maxilla 1, loss of plates of maxilliped and loss of lobe of coxa 4.

See *Figorella*.

**Removals.** *Pachychelium mediterraneum* Ruffo, 1975b,
Pachynus Bulycheva

Fig. 911


Type species. Pachynus chelatum Bulycheva, 1955, original designation.

Diagnosis. Of pachynin form. Mouthparts forming quadrate bundle. Labrum and epistome not prominent, separate, blunt. Incisor ordinary, molar absent; palp attached distally. Inner plate of maxilla 1 reduced, not setose; palp 2-articulate, large. Inner very poorly and outer plate of maxilliped well developed, palp thin, slightly exceeding outer plate, dactyl absent (article 3 elongate) or dactyl present. Coxa 1 large and visible, not tapering. Gnathopod 1 strongly enlarged, strongly chelate, article 5 much shorter than 6, almost obsolescent, dactyl large; article 6 of gnathopod 2 slightly shorter than article 5, ordinary, propodus minutely chelate, article 7 vestigial. Inner ramus of uropod 2 without notch. Uropod 3 short, peduncle ordinary, inner ramus slightly shortened, outer ramus 2-articulate. Telson ordinary (rectangular), entire.

Additional characters. Base of flagellum on antenna 1 with callynophore; peduncle of antenna 1 with weak cristate: mandible with rakers and left lacinia mobilis; spines on outer plate of maxilla 1 simple, 8 (5/3), palp with apical spines; plates of maxilla 2 very thin; coxa 4 with well-developed posteroventral lobe; gnathopod 1 palm defined by complex spine; article 4 of perepod 5-7 expanded; pereonite 5 [without dorsal tooth].

Variables. Eyes present or absent; accessory flagellum formed of scale (P. barnardi); outer plate of maxilla 1 with 8 or 10 spines, palp 1-articulate (P. barnardi); outer plate of maxilliped with 3 spines (P. barnardi), dactyl present (P. barnardi).

Relationship. Differing from other pachynin genera in the simple spines on the outer plate of maxilla 1, in the conjoint base of the flagellum of antenna 1 and in the presence of terminal spines on the palp of maxilla 1, the 5/3 arrangement of spines on the outer plate, and the relatively smaller outer plate (medium) of the maxilliped, with inner plates slightly enlarged.

Differing from Pachychelium in the presence of a palp on maxilla 1, better developed inner plate of the maxilliped, chelate gnathopod 1, and smaller antenna 1 with much shorter article 1 on the primary flagellum. From Prachynella in the presence of a palp on maxilla 1. From Figorella in the non-excavate posterior margin of the hand on gnathopod 1 and the enlarged, claw-like defining spine. From Koroga in the small head and coxae, vermiform body, vestigial carpus of gnathopod 1, stouter and shorter antennae 1-2, vestigial inner plate of the maxilliped, and the feeble maxilla 2. From Normanion in the much longer palp of the maxilliped, more distally placed mandibular palp, and the short peduncle of uropod 3. From Onesimoides in the lack of molar, very short and lobate article 5 of gnathopod 1, short article 1 of the primary flagellum on antenna 1, and lack of flange on the accessory flagellum.


Habitat and distribution. Marine, fringes of North Pacific from Baja California to the Japan Sea, south-east Australia, 2-800 m, 4 species.

Paracallisoma Chevreux

Paracallisoma Chevreux, 1903: 84.

Type species. Paracallisoma alberti Chevreux, 1903, original designation.

Diagnosis. Of scopelocheirin form. Mouthparts forming quadrate bundle. Labrum and epistome each weakly produced, separate, epistome strongly dominant in size, blunt. Incisor ordinary, molar simple, small, subconical; palp attached slightly proximal to molar. Inner plate of maxilla 1 strongly setose medially; palp 2 articulate, large. Inner and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl well developed. Coxa 1 slightly shortened and partly covered by coxa 2, tapering. Gnathopod 1 short, simple; article 5 longer than 6, dactyl vestigial, shrouded in setae; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely subchelate. Inner ramus of uropod 2 without notch. Uropod 3 almost aequiramous, ordinary, peduncle ordinary, outer ramus 2-articulate. Telson elongate, deeply cleft.
Variables. Coxa 5 covering most of coxa 6 (P. alberti); gnathopod 2 article 6 distally broadened, subtriangular, short, dactyl inserted on forward distal angle of article 6 (P. alberti), article 6 distally slender, right-angled, little narrowed proximally, dactyl with somewhat middle insertion on apex of article 6, dactyloan apex reaching palmar edge, palm transverse (P. coecum, P. platepistomum); telson with spine in apical notch (P. alberti), spine absent (P. coecum, P. platepistomum).

Relationship. Differing from Scopelocheirus in the non-chelate gnathopod 2.

See Paracallisomopsis.


Habitat and distribution. Marine, cosmopolitan bathyal-abyssal, pelagic, capture depths imprecise, ?1000-?7625 m, 3 species.

Paracallisomopsis Gurjanova

Fig.92J Paracallisomopsis Gurjanova, 1962: 311.

Type species. Paracallisomopsis beljaevi Gurjanova, 1962, monotypy.

Taxonomy. Possible juvenile of Paracallisoma alberti (fide Stroobants, 1976).

Diagnosis. Of scopelocheirin form. Mouthparts forming quadrate bundle. Labrum and epistome continuously produced, prominent, separate, epistome strongly dominant in size and projection, blunt. Incisor ordinary, molar triturative, large, palp attached opposite molar. Inner plate of maxilla 1 moderately (5) setose; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl well developed. Coxa 1 slightly shortened and partly covered by coxa 2, tapering. Gnathopod 1 slightly elongate, nearly simple, palm oblique, articles 5 and 6 subequal, dactyl vestigial, shrouded in setae; article 6 of gnathopod 2 slightly shorter than article 5, ordinary, propodus minutely subchelate. Inner ramus of uropod 2 without notch. Uropod 3 ordinary, peduncle ordinary, inner ramus scarcely shortened, outer ramus 2-articulate. Telson elongate, deeply cleft.

Additional characters. Outer plate of maxilla 1 with 4 spines; setae of plates on maxilla 2 weak; outer plate of maxilliped with 2 apical spines and 1 setule; pereopods 5-7 thin and of similar length, article 2 of pereopod 5 slender; article 2 of outer ramus on uropod 3 elongate.

Relationship. Differing from Paracallisoma and Eucallisoma in the lack of medial setae on the inner plate of maxilla 1, indistinct dactyl of gnathopod 1, and differing from Eucallisoma additionally in larger head, smaller antenna 1 with less elongate flagellum base, erect accessory flagellum, less styliform gnathopod 1 with more dense cirri, more spines on outer plate of maxilliped, and shorter article 2 on outer ramus of uropod 3.

Differing from Aroui and Scopelocheirus in the non-chelate gnathopod 2.

Species. Paracallisomopsis beljaevi Gurjanova, 1962 [278].

Habitat and distribution. Marine, Bering Sea, Kamchatka, Olyutorsky Bay, 150 m, 1 species.

Paracentromedon Chevreux & Fage

Figs 90S, 92B Paracentromedon Chevreux & Fage, 1925: 57.

Type species. Centromedon crenulatum Chevreux, 1900a, original designation.

Diagnosis. Mouthparts forming quadrate bundle. Labrum and epistome continuous, not prominent, coalesced, labral part slightly dominant in size and projection, blunt. Incisor ordinary, molar triturative, large, palp attached opposite molar. Inner plate of maxilla 1 weakly (2) setose; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp slightly exceeding outer plate, dactyl well developed. Coxa 1 large and visible, not tapering. Gnathopod 1 short, simple (type) or subchelate, articles 5 and 6 subequal, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus subchelate. Inner ramus of uropod 2 without notch. Uropod 3 ordinary, peduncle elongate, inner ramus slightly shortened, outer ramus 2-articulate. Telson elongate, deeply cleft.

Additional characters. Head ‘small’; article 3 of mandibular palp half or less as long as article 2; article 1 of flagellum on antenna 1 twice as long as articles 2-3 on peduncle combined; female antenna 2 as long as antenna 1; article 2 of pereopods 5-6 narrowly rectangular (versus Hippomedon); pereopod 5 not shortened; pereopod 6 or 7 slightly longest but generally pereopod 5=6=7; gill 7 [unknown].

Variables. Dactyls of pereopods 3-4 elongate (P. carabicus); article 2 of pereopods 5-6 narrowly
rectangular (P. carabicus); urosomite 1 with sharp dorsal cusp (P. carabicus).

Note on P. whero. Probably belongs in a new genus because of the expanded article 2 of pereopods 5-6; other oddities of this species include eye with conical lens dorsally, flanged peduncle of uropod 2, flanged articulation on pleonite 4 and nails on dactyls of gnathopod 1 and pereopods 3-4. Generic placement may also include Hippomedon manene and H. matikuku (see Lowry, in litt., 1991).

Relationship. Differing from Hippomedon, Psammonyx and Wecomodon in the short article 3 of the mandibular palp. From Elmedon in the three fourths cleft of the telson (Elmedon = half).

Species. Paracentromedon carabicus J.L. Barnard, 1964a [406B]; P. crenulatus (Chevreux, 1900a) (Chevreux & Fage, 1925) (Bellan-Santini, 1984) [350B]; ?P. manene (Lowry & Stoddart, 1983a) [776s]; ?P. matikuku (Lowry & Stoddart, 1983a) [776s]; ?P. whero (Fenwick, 1983) [774].

Habitat and distribution. Marine, amphiatlantic low latitudes, 180-1715 m, 2 species; P. whero from New Zealand, 6 m.

Paracyphocaris Chevreux

Fig.91Q

Paracyphocaris Chevreux, 1905a: 1.

Type species. Paracyphocaris praedator Chevreux, 1905a, original designation.

Diagnosis. Of cyphocarin form, head tall, horizontally short, grotesque. Flagellum of antenna 2 short (5-articulate); accessory flagellum vestigial, 1-articulate. Mouthparts forming quadrant bundle. Labrum and epistome almost continuous, not differentially produced, neither dominant. Incisor ordinary, rakers absent; molar absent; palp attached in middle of mandible. Inner plate of maxilla 1 weakly (3) setose; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp slightly exceeding outer plate, dactyl well developed. Coxae 1-2 small, strongly shortened and partly covered by coxa 3, coxa 4 largest, lobate, excavate. Gnathopod 1 short, simple, articles 5 and 6 subequal, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, propodus simple. Uropod 3 ordinary, peduncle scarcely elongate, inner ramus slightly shortened, outer ramus 2-articulate. Telson elongate, deeply cleft.

Additional characters. P. distinctus; pereopod 6 simple (P. brevicornis).

Variables. Palp of mandible 3-articulate (type) or 2-articulate (P. distinctus); pereopod 6 simple (P. brevicornis).

Relationship. Paracyphocaris is a good model for the Paracyphocarina group counter to the Cyclocarina group; the base of the flagellum on antenna 1 has no callymaphore. Paracyphocaris seems to be primitive because the telson is elongate and deeply cleft, and the mandible has a palp but it is poorly setose.

See Cebocaris, Crybelocephalus, Crybelocycarina, Cyphocarioides, Mesocyphocaris and Metacyphocaris.


Habitat and distribution. Marine, cosmopolitan, bathy-, possibly abyssopelagic, often egg parasite on pelagic shrimp, Oplophorus, confirmed 900-1020 m. 4 species.

Paralibrotrus Stephensen

Fig.89V

Paralibrotrus Stephensen, 1923b: 61.

Type species. Paralibrotrus setosus Stephensen, 1923b, monotypy.

Diagnosis. Mouthparts forming quadrant bundle. Labrum and epistome separate, both equally projecting. Blunt. Incisor ordinary, molar weakly triturative, small, also setulose; palp attached slightly proximal to molar. Inner plate of maxilla 1 weakly (2) setose; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl well developed. Coxae 1 large and visible, not tapering. Gnathopod 1 short, simple, article 5 shorter than 6, lobate. Dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 with small notch. Uropod 3 short, peduncle ordinary, inner ramus slightly shortened, outer ramus 2-articulate. Telson short, emarginate.

Additional characters. Peduncles of antennae 1 thick, articles short (versus Lystanassa), outer plate of maxilla 1 with only 4 spines; coxa 4 scarcely excavate posteriorly, not definitely lobate.

Relationship. Characterised from all other genera in the reduction of spines to 4 on the outer plate of
maxilla 1.

Differing from Onisimus (= Pseudalibrotus) and Boeckosium in the simple gnathopod 1. From Lysianella in the simple gnathopod 1 and much shorter telson. From Paralysianopsis in the blunt (versus sharp) prepubcal mass and stouter carpus of gnathopod 1. From Lysianopsis in the unexpanded peduncle of uropod 3 and from Lysianassa in the more distally placed mandibular palp and the thick peduncles of antennae 1-2. From Menigrates in the more distally placed mandibular palp, thicker peduncle of antenna 2, and the deeper notch of the prepubcal mass. From Parambassa in the thick peduncle of antenna 2, the 2-articulate outer ramus of uropod 3, and the short telson. From female Pseudambassa in the slight plates of maxilla 2, the 2-articulate outer ramus of uropod 3, the relatively even size of the epistome and labrum in the prepubcal mass, the shorter telson, and the more distally placed mandibular palp.

See Douniaella.

Species. Paralibrotus setosus Stephensen, 1923b (Gurjanova, 1951) [220].

Habitat and distribution. Marine, West Greenland to Chukchi Sea, 128-166 m, 1 species.

Paralicella Chevreux


Type species. Paralicella tenuipes Chevreux, 1908a, original designation.

Diagnosis. Mouthparts forming quadrate bundle. 
Labrum and epistome not differentially produced, eparate. Incisor ordinary, molar simple, large, onicolamate, setulose, palp attached opposite molar. Inner plate of maxilla 1 strongly (10+) setose; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl well developed. Coxa 1 large and visible, not tapering. Gnathopod 1 subchelate, palm oblique, articles 5 and 6 subequal, dactyl large, article 6 of gnathopod 2 slightly shorter than article 5, both very elongate and linear, propodus subchelate, palm oblique, dactyl large. Inner ramus of uropod 2 without notch. Uropod 3 ordinary, peduncle slightly elongate, rami subequal, outer ramus 2-articulate. Telson elongate, deeply cleft.

Additional characters. Flagella of antennae elongate, articles short; article 1 of antenna 2 swollen; article 5 of antenna 2 moderately to greatly shortened; inner plate of maxilla 2 with oblique facial row of setae; article 3 of gnathopod 1 elongate (versus Aristias, Eurythenes); outer rami of uropods 1-2 shortened.

Sexual dimorphism. Article 1 of primary flagellum on antenna 1 more elongate and better armed in male; urosomite 1 with dorsal notch in male.

Variables. Coxa 1 reduced (P. similis), article 2 of pereopods 5-7 alike (P. fusiformis), diverse (type, etc.); article 2 of pereopod 7 strongly bevelled (type, etc.), poorly bevelled (P. caperescus), not bevelled (P. fusiformis); article 2 on outer ramus of uropod 3 variable in length.

Relationship. Like Alicella but gnathopod 1 subchelate.

Differing from Eurythenes in the elongate article 3 of gnathopod 1.


Habitat and distribution. Marine, cosmopolitan, bathy and abyssopelagic, 1414-5720 m, 5 species.

Paralysianopsis Schellenberg


Type species. Paralysianopsis odhneri Schellenberg, 1931, monotypy.

Diagnosis. Mouthparts forming quadrate bundle. Labrum and epistome continuous, coalesced, labral part strongly projecting and sharp. Incisor ordinary, molar simple, small, scarcely ridged; palp attached slightly proximal to molar. Inner plate of maxilla 1 weakly (2) setose; palp 2-articulate, large, apex weakly spinose. Inner and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl well developed. Coxa 1 large and visible, not tapering. Gnathopod 1 short, nearly simple but poorly subchelate, palm oblique, articles 5 and 6 subequal, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely chelate. Inner rami of uropod 2 with large notch. Uropod 3 ordinary, peduncle ordinary, inner rami scarcely shortened, outer ramus 2-articulate, article 2 long. Telson ordinary, emarginate.

Variables. Paralysianopsis mauritiensis with following anomalies: outer ramus of uropod 3 1-articulate, inner rami somewhat shortened; notch on inner ramus of uropod 2 weak; lobe of coxa 4 weak; telson un-notched.
**Relationship.** Differing from *Lysianassa* and allies in the relatively distal placement of the mandibular palp and the apparent fusion of the upper lip and epistome into a sharp cusp; thus from *Lysianopsis* in the short article 1 on the mandibular palp. From *Kakanui* in the weakly subchelate gnathopod 1 and distally placed mandibular palp. From female *Pseudambasia* (not = *Parambasia*) in the relatively distal mandibular palp, with short article 1; thin plates of maxilla 2, sharp prebuccal mass, and the short article 2 of antenna 1.

**Species.** Paralysianopsis mauritiensis Ledoyer, 1978b [697]; *P. odhneri* Schellenberg, 1931 (= *P. rhinoceros* K.H. Barnard, 1931a,1932) (Lowry & Stoddart, 1984a) [880].

**Habitat and distribution.** Marine, Falklands, South Georgia and ?Mauritius, 2-27 m, 2 species.

*Parambasia* Walker & Scott


**Type species.** *Parambasia forbesi* Walker & Scott, 1903, monotypy.

**Taxonomy.** Lowry & Stoddart (1983a) believe that *Pseudambasia* Walker & Scott is a junior synonym of *Parambasia*. We also believe this to be possible but keep them separate until the type species of *Parambasia* is definitely recovered.

**Diagnosis.** Mouthparts ['forming quadrate bundle], not styliform. Labrum and epistome ['prominent, coalesced, epistome strongly dominant in size and projection, blunt]. Incisor ordinary, molar ['absent]; palp attached strongly proximal. ['Inner plate of maxilla 1 weakly setose; palp 2-articulate, large]. Inner and outer plates of maxilliped well developed, palp slightly exceeding outer plate, dactyl small. Coxa 1 large and visible, not tapering. Gnathopod 1 short, simple, article 5 much shorter than 6, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus subchelate. Inner ramus of uropod 2 without notch. Uropod 3 ordinary, peduncle ordinary, inner ramus slightly shortened, outer ramus 2-articulate. Telson ordinary, cleft halfway.

**Additional characters.** Article 2 of antenna 1 and non-constricted inner ramus of uropod 2.

Too many other attributes of *Parambasia forbesi* are unknown to make further distinctions; for example, *Pseudambasia*, the senior synonym attributed by Lowry & Stoddart (1983a), has the unusual feature of coalesced urosomites 2-3, unknown for *Parambasia*. Items needed for *Parambasia* include details on all mouthparts, urosomites and uropods.

See *Arugella*, *Pronannonyx*.

**Species.** *Parambasia acuticaudata* Ledoyer, 1984 [586]; *P. forbesi* Walker & Scott, 1903 [676]; *P. nui* Myers, 1985c [576].

**Habitat and distribution.** Marine, Abd-el-Kuri, New Caledonia, and Fiji, 0 m, 3 species.

*Paratryphosites* Stebbing

*Paratryphosites* Stebbing, 1899a: 206.–Jarrett & Bousfield, 1982: 120.

**Type species.** *Lysianassa abyssi* Goes, 1866, original designation.

**Diagnosis.** Mouthparts forming quadrate bundle. Labrum and epistome ['differentially produced, separate, labrum slightly dominant in size and projection, blunt]. Incisor ordinary, molar triturative, large, palp attached opposite molar. Inner plate of maxilla 1 moderately (5) setose; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp scarcely exceeding outer plate, dactyl well developed. Coxa 1 large and visible, not tapering. Gnathopod 1 short, poorly subchelate, palm oblique, article 5 longer than 6, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus subchelate. Inner ramus of uropod 2 without notch. Uropod 3 ordinary, peduncle ordinary, inner ramus slightly shortened, outer ramus 2-articulate. Telson ordinary, cleft halfway.

**Additional characters.** Head 'small'; article 1 of antenna 1 weakly carinate apically; female antenna 2 more than twice as long as antenna 1; pereopod 5 not shortened, pereopod 6 longest; telson cleft halfway or less, telsonic lobes broadly truncate, each with 7-9 spines; gill 7 absent.

**Sexual dimorphism.** Male antenna 1 flagellum elongate (30 articles versus 12 articles in female) antenna 2 flagellum elongate in male.

**Relationship.** Differing from *Hippome*, *Psammonyx* and *Wecomedon* in the strongly spinose apices of the telson, and the combination of long...
Paracentromedon in the regularly elongate article 3 of mandibular palp.

**Species.** Paratryphosites abyssi (Goes, 1866) (= P. stephensi [sic] Frost, 1936) (Shoemaker, 1930b, 1955) (Gurjanova, 1962) (Jarrett & Bousfield, 1982) [200 + B].

**Habitat and distribution.** Marine, amphiboreal, arctic, south to 32° in West Atlantic, 0-528 m, 1 species.

**Parawaldeckia** Stebbing

**Fig. 88C**


**Type species.** Nannonyx thomsoni Stebbing, 1906, monotypy.

**Diagnosis.** Mouthparts forming quadrate bundle. Labrum and epistome continuous, coalesced, with slight raphus, epistomal part strongly dominant in size and projection, blunt. Incisor ordinary, molar simple, small, conicalominate to subconical, setulose; palp attached strongly proximal to molar. Inner plate of maxilla 1 weakly (2) setose; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp slightly exceeding outer plate, dactyl well developed. Cox a 1 large and visible, not tapering. Gnathopod 1 short, simple; articles 5 and 6 subequal or 5 shorter than 6, weakly lobate, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 with or without small notches. Uropod 3 parviramous, peduncule ordinary, inner ramus strongly shortened in female, less in male, outer ramus 2-articulate. Telson ordinary, weakly cleft, emarginate, or entire.

**Additional characters.** Palp of maxilla 1 apically serrate, not spinose; outer plate of maxilliped spineless; peduncle of uropod 3 expanded and plate-like.

**Sexual dimorphism.** Male primary flagellum of antenna 1 with calyxyophore and with calceoli; flagellum of antenna 2 elongate and calceolate; mandibular palp articles 2-3 and long spines; peduncle of uropod 1 with long dorsal spines; rami of uropod 3 more equal in size and heavily setose; telson thickened and more deeply notched than in female, with 2 dorsal rows of prickles.

**Variables.** Article 1 of antenna 1 cristate and/or with dorso-distal process (P. kidderi), these features not present (P. hirsuta, etc.); left labium mobilis present or absent (right always absent); article 1 of mandibular palp elongate (P. stebbingi), not elongate (P. yamba); palp of maxilla apically serrate (P. dilkera), not serrate (P. yamba); propodus of gnathopod 1 serrate (P. stebbingi, etc.), not serrate (P. dilkera); article 4 of pereopod 3 short (P. pulchra), long (P. suae, etc.); notch on inner ramus of uropod 3 weak or absent; telson cleft halfway (P. vesca), spinose (P. stebbingi), or not (type, etc.).

**Relationship.** Generally the 'aulst Lysianassa' but differing from Lysianassa in the mostly fused prebuccal mass with the epistomal part dominant (in Lysianassa the labral portion is usually dominant, occasionally with matching but never dominating epistome); also differing from Lysianassa in the short inner ramus of uropod 3. From Onesioides in the simple gnathopod 1, proximal position of mandibular palp, and unexpanded base of the accessory flagellum. From Clepidecrella in the proximal position of the mandibular palp, well-developed plates of the maxillipeds, better developed maxillae 1-2, and broad article 2 of pereopod 5. From Pseudambasia in the diversity of the sexes concerning the antennae and uropod 3, in the weak or absent notch on the inner ramus of uropod 2, the 2-articulate outer ramus of uropod 3 and in the male the simple gnathopod 1 (female Pseudambasia with simple gnathopod 1, male with subchelate gnathopod 1). From Socarnella in the 2-articulate outer ramus of uropod 3. From Socarnoides in the poorly notched inner ramus of uropod 2.

**Waldeckia** differs from Parawaldeckia in the elongate, deeply cleft, telson and long inner ramus of uropod 3. The prebuccal shape distinguishes Parawaldeckia from Socarnes, Menigrates and Onesioides.

The parviramous uropod 3 distinguishes Parawaldeckia females from Socarnes, Menigrates, Socarnella, Socarnoides and Waldeckia.


**Habitat and distribution.** Marine, circum-austral, primarily southern Australia, New Zealand, Fiji, and antarctic islands, males coming to night lights, 0-42 m.
Its species.

**Paronesimoides** Pirlot

_Type species._ *Paronesimoides lignivorus* Pirlot, 1933a, original designation.

**Diagnosis.** Mouthparts forming quadrat bundle. Labrum and epistome [?continous, not differentially produced, not prominent, ?coalesced, ?labrum ‘strongly dominant’ in size, blunt]. Incisor ordinary, molar weakly triturative, large, weakly conicolaminate and setulose; palp attached opposite molar. Inner plate of maxilla 1 weakly (2) setose; palp 2-articulate, large. Inner plate well developed but outer plate of maxilliped poorly developed, palp strongly exceeding outer plate, dactyl well developed, small. Coxa 1 slightly shortened and partly covered by coxa 2, tapering. Gnathopod 1 slightly enlarged, strongly subchelate, palm transverse, article 5 much shorter than 6, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely and weakly chelate. Inner ramus of uropod 2 without notch. Uropod 3 short, peduncle ordinary, inner ramus vestigial, fused to peduncle, outer ramus 2-articulate, weak. Telson short, entire.

**Additional characters.** Ocular lobe narrow and sharp; article 1 of antenna 1 with weak tooth, article 2 about 45% as long as article 1.

**Relationship.** Differing from *Onesimoides* in the full loss of the inner ramus on uropod 3 and the longer article 2 of antenna 1. From *Clepidoderella* in the thinner antenna 1 with longer article 2, subchelate gnathopod 1, large plates of the maxillipeds, and well-developed maxillae 1-2. From all other non-cyphocarid genera in the loss of the inner ramus on uropod 3.

**Species.** *Paronesimoides lignivorus* Pirlot, 1933a [601A].

**Habitat and distribution.** Marine, Celebes Sea, 2053 m, 1 species.

**Paronesimus** Stebbing

_Type species._ *Paronesimus barentsi* Stebbing, 1894, monotypy.

**Diagnosis.** Mouthparts forming quadrat bundle. Labrum and epistome separate, neither dominant in size nor projection, blunt. Incisor ordinary, molar weakly triturative, small, almost conicolaminate; palp attached opposite molar. Inner plate of maxilla 1 weakly (2) setose; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl well developed. Coxa 1 large and visible, not tapering. Gnathopod 1 short, nearly simple, palm oblique, article 5 slightly shorter than 6, dactyl large and strongly overlapping obsolescent palm; article 6 of gnathopod 2 slightly shorter than article 5, ordinary, propodus minutely and weakly chelate. Inner ramus of uropod 2 without large notch. Uropod 3 ordinary, peduncle ordinary, inner ramus slightly shortened, outer ramus 2-articulate. Telson elongate, weakly or well cleft.

**Additional characters.** Article 1 of antenna 1 dorsally cristate (but weakly in *P. uschakovi*); palp of maxilla 1 with 4 apical spines (versus *Boeckosimus*); plates of maxilla 2 very thin (versus *Anonyx*); outer plate of maxilliped with numerous tiny bead-like spines (versus *Anonyx*); propodus of gnathopod 2 slightly inflated, dactyl large; uropod 3 not overextending uropod 2 (versus *Anonyx*).

**Variables.** Articles 5 and 6 of gnathopod 1 subequal (*P. uschakovi*); telson weakly cleft (type), more deeply cleft (*P. uschakovi*).

**Relationship.** Very close to *Rifcus* but differing in the elongate telson, longer palp of the maxilliped and the normal spines on the outer plate of maxilla 1. Very close to *Pseudoanonyx* but differing in the larger dactyls of both gnathopod 1 and the maxilliped.

Differing from *Boeckosimus* in the broader palm and larger dactyl of gnathopod 2, the elongate telson, more elongate mandibular palp, and more elongate palp of maxilla 1 with fewer apical spines. From *Anonyx* in the narrow inner plate of maxilla 2, smaller uropods, fewer spines on the palp of maxilla 1, and the "...small bead-like spines on the outer plate of the maxilliped..." (Rd Stebbing, 1894, not necessarily well documented). From *Menigrates* in the elongate telson, longer dactyl of the maxilliped and in the more distally placed mandibular palp. From *Ichnopus* in the short article 3 and lack of an inner setal brush on the dactyl of gnathopod 1. From *Paracentromedon* in the larger head, thinner inner plate of maxilla 2, fewer spines or teeth on the apex of the palp on maxilla 1 and the shorter uropods. From *Menigratopsis* in the larger head, more evenly spined outer plate of the maxilliped, the larger dactyl of gnathopod 2 and the shorter uropod 3.

**Species.** *Paronesimus barentsi* Stebbing, 1894 (Stephensen, 1935a) (Dunbar, 1954) (Shoemaker, 1955a) (Gurjanova, 1962) [200]; *P. uschakovi* Gurjanova, 1933b, 1935, 1951 [292].

**Habitat and distribution.** Marine, high Arctic (including Hudson Bay), 12-180 m, 2 species.
Parschisturella Andres

Parschisturella Andres, 1983: 212.

Type species. Parschisturella simplex Andres, 1983, original designation.

Diagnosis. Mouthparts forming quadrate bundle. Labrum and epistome differentially produced, prominent, separate, labrum strongly dominant in size and projection, sharp. Incisor ordinary, molar weakly triturative, large, also setulose; palp attached opposite molar. Inner plate of maxilla 1 moderately (5-7) setose apically; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl well developed. Coxa 1 slightly shortened but large and visible, not tapering. Gnathopod 1 short, simple, (or weakly subchelate), article 6 shorter than 5, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 with small (to large) notch. Uropod 3 ordinary, peduncle ordinary, inner ramus slightly shortened, outer ramus 2-articulate. Telson elongate, deeply cleft.

Additional characters. Antenna 1 article 1 carinate; maxilliped outer plate with apical spines and setae (versus Tryphosites), palp very long (versus Tryphosites); gnathopod 1 palm very small, transverse, 4-dentate, dactyl with inner tooth; pereopods 5-7 short (versus Tryphosites); each apex of telson with 2+ (usually 3-5) spines.

Variables. Notches above and below sharp process of prebuccal mass absent (P. carinata); gnathopod 1 simple (type), subchelate, palm small and transverse (P. capadarei, P. carinata).

Relationship. Differing from Schisturella, Ambasiopsis and Metambasia in the much larger coxa 1, sharply conical process of the upper lip, lack of the one especially enlarged basalmost medial seta on the inner plate of maxilla 2, many more apical spines on the outer plate of the maxilliped, and the shorter article 1 on the primary flagellum of antenna 1. From Tryphosites in the shorter article 1 of the primary flagellum, the fusion of the prebuccal mass and lack of notch therein, the presence of 5+ (versus 2) setae on the inner plate of maxilla 1, the presence of apical spination on the outer plate of the maxilliped, the long maxillipedal palp, the unexpanded apex of coxa 1, the almost simple gnathopod 1 and the short pereopods 5-7. From Paralyasianopsis in the elongate, deeply cleft telson, carinate antenna 1, and the presence of a tooth on epimeron 3. From Tryphosella in the unreduced coxa 1 and sharp prebuccal mass. From Cicadosa in the sharp prebuccal mass, poorly subchelate gnathopod 1 and well-setose inner plate of maxilla 1.

Identification note. The second species requires further distinction from the earlier, less fully described P. carinata.

Species. Parschisturella carinata (Schellenberg, 1926a, 1931, as Tryphosa) (= P. capadarei Hurley, 1965) (= P. stebbingi identification of Chilton, 1912) [870 + B]; P. simplex Andres, 1983 [833].

Habitat and distribution. Marine, Antarctica and outliers, 0-385 m, 2 species.

Perrierella Chevreux & Bouvier

Fig.93A

Perrierella Chevreux & Bouvier, 1892.—Lincoln, 1979a: 46. \(Parschisturella\) crassipes Chevreux & Bouvier, 1892 (= Lysianassa Audouiniana Bate, 1857a), original designation.

Diagnosis. Mouthparts forming quadrate bundle. Labrum and epistome continuous, not differentially produced, not prominent, coalesced, blunt. Incisor ordinary, molar simple, obsolescent, conicolaminate, setalose, palp attached opposite molar. Inner plate of maxilla 1 moderately (6) setose; palp 2-articulate, large. Inner poorly and outer plates of maxilliped well developed, palp not exceeding outer plate, dactyl absent. Coxa 1 strongly shortened and partly covered by coxa 2, tapering. Gnathopod 1 short, poorly subchelate, palm oblique, articles 5 and 6 subequal, 5 weakly lobate, dactyl large; article 6 of gnathopod 2 slightly shorter than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 without notch. Uropod 3 short, peduncle ordinary, inner ramus not shortened, outer ramus 2-articulate. Telson elongate, emarginate.

Additional characters. Head large, but flat, relative to body, rostrum large and keel-like; antenna 1 thin; main flagella of antennae 1-2 about 4-articulate; article 2 of mandibular palp elongate, article 3 less than 60% as long as article 2; plates of maxilla 2 short, broad, gaping, arranged so inner plate with medial edge setose; inner plates of maxilliped very small; gnathopod 1 very short and thick; pereopods 3-7 with weak chelate palm.

Relationship. Differing from Menigrates in the elongate unleft telson and short coxa 1. From Adeliella in small coxa 1, well setose and spinose maxillae 1-2, and elongate telson.

Close to Aristias and Ambasia but differing in loss of maxilliped dactyl and unleft telson. Close to but differing from Ambasiopsis and...
Phoxostoma K.H. Barnard


Type species. Phoxostoma algoense K.H. Barnard, 1926, monotypy.

Diagnosis. Of conicostomin form. Mouthparts forming conical bundle, some weakly styliform. Labrum and epistome not differentially produced, not prominent, separate, blunt. Incisor ordinary, molar simple, small, conicolaminate or subconical, setulose, palp attached proximal to molar. Inner plate of maxilla 1 naked or with 1 seta, palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl small to vestigial. Coxa 1 large and visible, not tapering. Gnathopod 1 short, palm poorly chelate, articles 5 shorter than 6, dactyl large; article 6 of gnathopod 2 greater than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 without notch. Uropod 3 acquiramous, ordinary, peduncle ordinary, outer ramus 1-articulate. Telson ordinary, emarginate or moderately cleft.

Additional characters. Head visible; antenna 1 with tooth; rakers present; outer plate of maxilla 1 with about 7 spines; outer plate of maxilla 2 thin, attached to geniculate process; dactyl of maxilliped small; article 4 of pereopods 5–7 slightly expanded posteroventrally, articles 5–6 narrow; uropods 1–2 strongly setose.

Sexual dimorphism. Reproductive male with elongate flagellum of antenna 2.

Variables. Gills pleated; antenna 1 lacking tooth; inner plate of maxilla 1 lacking seta (versus 1 giant in TS); telson deeply notched (all P. variegatus, probably = another genus).

Relationship. The most primitive conicostomin because of the elongate antenna 2 in the reproductive male, presence of (albeit vestigial) gill 7, and non-compressed urosome with well-developed biramous uropod 3. Differing from Bonassa and Dartenassa in the geniculate outer plate of maxilla 2.

Species. Phoxostoma algoense K.H. Barnard, 1926 (Griffiths, 1974c, 1975) (Lowry & Stoddart, 1984b) [743]; P. hypocrita (Raffo, 1953b) [447]; ?P. variegatus (Stimpson, 1856a) (Stebbing, 1888) (?Ledoyer, 1979a, 1986) [743 to 683].

Habitat and distribution. Marine, West Norway to eastern Mediterranean, occasionally on sponges, 0–100 m.

Podoprion Chevreux


Type species. Podoprion bolivari Chevreux, 1891b, monotypy.

Diagnosis. Mouthparts forming quadrate bundle. Labrum and epistome not differentially produced. Separate, neither dominant in size nor projection, blunt. Incisor (?toothed); molar absent; palp attached strongly distal. Inner plate of maxilla 1 moderately (6) setose apically; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl well developed. Coxa 1 slightly shortened and partly covered by coxa 2, tapering. Gnathopod 1 short, palm poorly chelate, articles 5 and 6 subequal, dactyl large; article 6 of gnathopod 2 slightly shorter than article 5, ordinary, propodus minutely and bluntly chelate. Inner ramus of uropod 2 without notch. Uropod 3 elongate, peduncle ordinary, inner ramus slightly shortened, outer ramus 2-articulate. Telson elongate, deeply cleft.

Additional characters. Article 1 of antenna 1 with ventral tooth; antennal flagella elongate; incisor ?toothed; article 1 of palp on maxilla 1 elongate; outer plate of maxilla 2 narrower than inner; article 3 of gnathopod 1 slightly elongate; article 2 of pereopod 5 with large posterior teeth (indurated); pereopods 6–7 very elongate; uropods 1–3 elongate.

Relationship. Characterised by chelate gnathopod 1, indurate pereopod 3 and slightly reduced coxa 1. Differing from Valetta in the elongate telson and uropod 3, weak to absent molar, elongate article 1 of palp on maxilla 1 and indurated pereopod 3. From Podoprionella, Frachynella, Podoprionella and...
**Normanion** in the well-developed palp and dactyl of the maxillipeds. From *Hyridocerca* in the smaller, less globular head, elongate telson and indurated pereopod 5. From *Euxonyx* in the elongate pereopods 6-7 and uropod 3, the gap in the chela of gnathopod 1, elongate article 1 of the palp on maxilla 1, and the indurated pereopod 5. From *Opisa* in the narrow chela 1, elongate pereopods 6-7, large palp of the maxilliped, and non-eusirid carpus of gnathopod 1. From *Cheirimedon* in the long, unlobate carpus of gnathopod 1, narrow chela of gnathopod 1, elongate antennae and pereopods 6-7 and uropod 3 and the indurated pereopod 5. From *Gainella, Pachynus, Koroga, Figorella, Sophrosyne*, and *Kyska* in the reduced coxa 1. From *Sophrosyne* in the smaller coxa 1, elongate telson, indurated pereopod 5, elongate pereopods 6-7 and uropod 3, and the long carpus of gnathopod 1. From following genera also bearing indurated pereopod 5 in the well-developed maxillipedal palp: *Podoprionella* and *Podoprionides*.

*Glycerina* and *Lucayaria* have a simple gnathopod 1, normal palp of maxilla 1 and short uropod 3.

*Schisturella* has a subchelate gnathopod 1 and untoothed pereopod 5.

**Species.** *Podoprion boliviari* Chevreux, 1891b (Chevreux & Fage, 1925) (Karaman, 1973b) (Ledoyer, 1977) [330].

**Habitat and distribution.** Marine, Brittany to Mediterranean, 12-183 m, 1 species.

*Podoprionella* Sars

**Type species.** *Podoprionella norvegica* Sars, 1895, monotypy.

**Diagnosis.** Mouthparts forming quadrate bundle. Labrum and epistome weakly separate, blunt. Incisor ordinary, molar absent; palp attached slightly proximal. Inner plate of maxilla 1 vestigial, naked, or absent, palp 2-articulate, large. Inner poorly and outer plates of maxilliped well developed, palp weak, not exceeding outer plate, dactyl absent. Coxa 1 slightly shortened and partly covered by coxa 2, not tapering. Gnathopod 1 enlarged, strongly chelate, article 5 shorter than 6, lobate, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, both very elongate and linear, propodus minutely chelate. Inner ramus of uropod 2 with notches. Uropod 3 ordinary, peduncle elongate, inner ramus strongly shortened, outer ramus 2-articulate. Telson ordinary, entire.

**Additional characters.** Article 3 of mandibular palp much less than half as long as article 2; outer plate of maxilla 1 with 6 spines; article 2 of pereopods 5-7 deeply indented; inner ramus of uropod 2 notched on both sides.

**Variables.** Plates of maxilla 2 of similar width but inner short (type), extending equally, but inner very broad, outer thin (*P. fissicaudata*); telson weakly cleft (*P. fissicaudata*).

**Relationship.** Differing from *Podoprionides* and *Normanion* in the unclef telson; and from *Normanion* in the indurated pereopods 5-7, non-eusirid carpus of gnathopod 1 and shorter peduncle of uropod 2. From *Podoprionides* also in the 1-articulate outer ramus of uropod 3.

**Species.** *Podoprionella fissicaudata* Ledoyer, 1977 [348]; *P. norvegica* Sars, 1895 (Stephensen, 1935a) [238].

**Habitat and distribution.** Marine, Marseille to Trondjheim Fjord, west Norway, 50-180 m, 2 species.

*Podoprionides* Walker


**Type species.** *Podoprionides incerta* Walker, 1906b, monotypy.

**Diagnosis.** Mouthparts forming quadrate bundle. Labrum and epistome continuously, not differentially produced, coalesced, submassive, blunt. Incisor ordinary, molar absent; palp attached slightly proximal. Inner plate of maxilla 1 naked; palp 2-articulate, large. Inner poorly and outer plate of maxilliped well developed, palp not exceeding outer plate, dactyl absent. Coxa 1 large and visible, not tapering. Gnathopod 1 enlarged, strongly chelate, articles 5 and 6 subequal, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely subchelate. Inner ramus of uropod 2 without notch. Uropod 3 ordinary, peduncle elongate, inner ramus slightly shortened, outer ramus 2-articulate. Telson elongate, deeply cleft.

**Additional characters.** Mandibular palp article 3 more than half as long as article 2 (versus *Podoprionella*); coxae small; article 2 of pereopods 5-7 deeply indented.

**Sexual dimorphism.** Primary flagellum of antenna 1 with calyxophore, enlarged and more brushy than in female.

**Relationship.** Differing from *Podoprion* in having pereopods 6-7 also indented, and incisor not toothed. From *Podoprionella* in the longer article 3 of the mandibular palp, 2-articulate outer ramus of uropod 3, and small coxae. From the following genera in the indurated pereopods 5-7: *Euxonyx, Gainella, Normanion*. 

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Barnard & Karaman: Marine Gammaridean Amphipoda 519
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and Opirsa.

Species. Podoprinoides incerta Walker, 1906b, 1907, (Schellenberg, 1926a) (K.H. Barnard, 1930) [870 + B].

Habitat and distribution. Marine, Antarctica, 0-?385 m (depths unclarified), 1 species.

Prachynella J.L. Barnard


Type species. Prachynella lodo J.L. Barnard, 1964b, original designation.

Diagnosis. Of pachynin form. Mouthparts forming conical bundle, somewhat styliform, some reduced. Labrum and epistome [?continuous, not differentially produced, not prominent, blunt]. Incisor ordinary, molar absent; palp attached strongly distal. Inner plate of maxilla 1 strongly reduced, not setose; palp absent or vestigial. Inner poorly and outer plates of maxilliped well developed, palp shorter than outer plate, dactyl absent, thus 3-articulate. Coxa 1 large and visible, not tapering. Gnathopod 1 strongly enlarged, strongly chelate, article 5 shorter than 6, vestigial, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 without notch. Uropod 3 short, peduncle ordinary, inner ramus strongly shortened, outer ramus 2-articulate. Telson ordinary, entire.

Additional characters. Base of flagellum on antenna 1 conjoint, with rows of aesthetascs; peduncle of antenna 1 with weak cristae; mandible lacking rakers and lacinia mobilis; maxilla 1 with vestigial palp (P. mediterraneum); palp lacking setae; spines on outer plate of maxilla 1 sculptured, 8-10; plates of maxilla 2 very thin; coxa 4 with well-developed posterovertral lobe; gnathopod 1 palm defined by complex spines; pereonite 5 with small posteriororal tooth; article 4 of pereopods 5-7 expanded.

Relationship. Differing from Drummondia in the absence of lacinia mobilis on the mandible, fewer spines on the outer plate of maxilla 1 and in the presence of only 3 articles on the maxillipedal palp.

Differing from Pachyplus and Figorella in the short (3-articulate) palp of the maxilliped and the lack of the palp on maxilla 1. From Podoprinoidella in the verminiform body and small coxae, non-indurated pereopods 5-7, the 2-articulate outer ramus of uropod 3, thin plates of maxilla 2, lack of palp on maxilla 1 and vestigial wrist of gnathopod 1.

See Pachychelium.


Habitat and distribution. Marine, California, west Mexico and Adriatic Sea, 10-791 m, 2 species.

Procyphocaris J.L. Barnard


Type species. Procyphocaris primata J.L. Barnard, 1961a, original designation.

Diagnosis. Of cyphocarid form with coxae 1-2 strongly shortened and partly covered by coxa 3, both tapering, coxa 2 largest. Mouthparts forming quadrate bundle. Labrum and epistome differentially produced, not prominent, coalesced, neither dominant in size nor projection, blunt. Incisor ordinary, molar weakly triturative, small; palp attached opposite molar. Inner plate of maxilla 1 [?weakly setose]; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl well developed. Gnathopod 1 short, nearly simple, palm oblique, article 5 longer than 6, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus subchelate. Inner ramus of uropod 2 without notch. Uropod 3 ordinary, peduncle slightly elongate, inner ramus slightly shortened, outer ramus 2-articulate. Telson elongate, deeply cleft.

Additional characters. Head slightly reduced and deformed; coxae 4-5 very large.

Relationship. The least specialised cyphocarid with essentially ordinary head bearing well-developed ocular lobes, well-developed triturative molar, non-indurated pereopods and lacking significant prehensility on pereopods. Mouthparts, legs and uropods essentially normal.


Habitat and distribution. Marine, southern Australia and southern Africa, 1280-1320 m, 1 species.

Pronannonyx Schellenberg


Type species. Pronannonyx minimus Schellenberg, 1933, monotypy.
**Diagnosis.** Mouthparts forming [quadrate] bundle. Labrum and epistome continuous, prominent, coalesced, blunt. Incisor ordinary, molar simple, ['verkummerten'], small; palp attached strongly distal to molar. Inner plate of maxilla 1 weakly (1-2) plate, maxilliped designation. Psammonyx molar

**Additional characters.** Palp article 3 of mandible elongate (articles 1-3 = 11:20:14); maxilliped palp short and thin, dactyl small.

**Relationship.** Differing from Parambasia in antenna 1 being less cristate, flagella of antennae 1-2 shorter, coxa 1 not expanded apically, not adze-shaped, and in the shorter telson. From Socarnes group in the unpleated gills. From Nannonyx in the more projecting prebuccal area with no epistomal part apparent, narrower gnathopod 1, and lack of article 2 on the outer ramus of uropod 3.

**Species.** Pronannonyx minimus Schellenberg, 1953

**Habitat and distribution.** Marine, south-west Africa, Luderitz Bay to Walvis Bay, shallow water, 1 species.

Psammonyx Bousfield


**Type species.** Anonyx nobilis Stimpson, 1853, original designation.

**Diagnosis.** Mouthparts forming quadrate bundle. Labrum and epistome not prominent, separate, labrum slightly dominant in projection, blunt. Incisor ordinary, molar triturative, large, also setulose, palp attached opposite molar; inner plate of maxilla 1 weakly (1-2) setose; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp scarcely exceeding outer plate, dactyl small. Coxa 1 large and visible, not tapering. Gnathopod 1 short, simple, article 5 shorter than 6, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 without notch. Uropod 3 short, peduncle expanded, plate-like, rami short, inner slightly shortened, outer ramus 1-articulate. Telson ordinary, entire.

**Additional characters.** Peduncle of antenna 1 little inflated but elongate, weakly cristate apicodorsally; flagellar article 1 shorter than either articles 2-3 of peduncle (versus Wecomedon); coxae 2-4 very long (versus Anonyx); dactyl of gnathopod 1 lacking tooth; article 4 of pereopods 3-4 strongly produced anterodistally; pereopod 5 about 25% shorter than pereopods 6-7 (versus Wecomedon); pereopod 7 distinctly longest (versus Wecomedon); coxal gill 7 absent (versus Hippomedon).

**Sexual dimorphism.** Female with or without calceoli on antenna 2, male with calceoli on antenna 1-2.

**Variables.** Antenna 2 with calceoli in female (Atlantic), without calceoli (Pacific); coxae 1-4 well setose (type), setae absent, notches unitary (all others); gnathopod 1 articles 5-6 long and narrow (Pacific species), short and broad (Atlantic species); epimeron 3 tooth well developed (Pacific species, P. longimerus, P. kurilicus), not well developed (Atlantic species, P. nobilis, P. terranovae); telson with lateral spines (type), lacking spines (P. terranovae).

**Relationship.** Kyska differs in chelate gnathopod 1 with short lobate carpus and apically expanded coxa 1. Differing from Wecomedon in the long pereopod 7, short pereopod 5 and short article 1 of primary flagellum on antenna 1. Hippomedon differs from Psammonyx in conjoint base of primary flagellum on antenna 1 and presence of coxal gill 7.

Differing from Anonyx in the unexpanded coxa 1, longer coxae 2-4, smaller head, stronger and ridged molar, and longer pereopod 7. From Tmetonyx in the short article 3 of gnathopod 1. Paratryphosites differs in the apically broad, spinose (7-9) lobes of telson, with the telson cleft only halfway. See Wecomedon.

**Species.** Psammonyx kurilicus (Gurjanova, 1962) [280]; P. longimerus Jarrett & Bousfield, 1982 [270]; P. nobilis (Stimpson, 1853) (= P. quadratus Kunkel, 1918) (Shoemaker, 1930a) (Bousfield, 1973) (J. Dickinson et al., 1980) [260]; P. terranovae Steele, 1979c [255].

**Habitat and distribution.** Marine, pan boreal, 0-200 m, 4 species.

Psammaryllis Andres


**Type species.** Pseudamaryllis nonconstricta Andres, 1981a, original designation.

**Diagnosis.** Mouthparts forming quadrate bundle.
Labrum and epistome separate, neither dominant in size nor projection, blunt. Incisor ordinary, molar simple, large, conicalamate or subconical, setulose; palp attached strongly proximal to molar. Inner plate of maxilla 1 weakly (2) setose; palp absent. Inner and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl well developed. Coxa 1 strongly shortened and partly covered by coxa 2. Gnathopod 1 short, simple, article 5 shorter than 6, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus subchelate. Inner ramus of uropod 2 without notch. Uropod 3 acquiramous, ordinary, but peduncle elongate, outer ramus 1-articulate. Telson ordinary, weakly cleft.

Additional character. Anteroventral corner of coxa 4 rounded (versus Vijaya).

Relationship. Differing from Amaryllis and Vijaya in the absence of the notch on the inner ramus of uropod 2 and the strongly proximal position of the mandibular palp. From Vijaya in the rounded anteroventral corner of coxa 4.

Species. Pseudamaryllis nonconstricta Andres, 1981a (Ledoyer, 1986) [677B].

Habitat and distribution. Marine, Red Sea, bathyal, 731-1544 m, 1 species.

Pseudambasia Stephensen

Pseudambasia Stephensen, 1927a: 305. not Parambasia Walker & Scott, 1903 (see).

Type species. Pseudambasia bipartita Stephensen, 1927a, monotypy.

Diagnosis. Mouthparts forming quadrate bundle. Labrum and epistome continuous, prominent, coalesced, epistomal part strongly dominant in size and projection, blunt. Incisor ordinary, smooth; palp attached strongly proximal. Inner plate of maxilla 1 naked; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl well developed. Coxa 1 large and visible, not tapering. Gnathopod 1 short, sexually diverse, nearly simple in female, strongly subchelate in male, palm oblique and excavate, articles 5 and 6 subequal, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely subchelate. Inner ramus of uropod 2 with large notch. Uropod 3 almost acquiramous, short, but peduncle elongate, inner ramus scarcely shortened, outer ramus 1- articulate. Telson ordinary, entire.

Additional characters. Article 2 of antenna 1 longer than usual, more than half as long as article 1; mandibular palp article 1 elongate, article 3 with only 2 feeble E setae; plates of maxilla 2 short broad, inner triangular, outer rectangular, inner with setose bevelled apical margin; outer plate of maxilliped lacking spines; propodus of gnathopod 2 broad, scutelliform, with large apical setae and small dactyl offset towards palm (like Parambasia); urosomites 2-3 coalesced.

Sexual dimorphism. Propodus of gnathopod 1 in male powerful, well subchelate, in female propodus feeble, palm obsolescent, dactyl more feeble; otherwise antennae, eyes and uropods similar between the sexes.

Technical note. Molar absent, line of setae noted by Lowry & Stoddart (1983a) not considered to be molar but normal to other lysianassids with pubescence between rakers and molars.

Relationship. Differing from Parambasia in the short article 3 and long article 5 of gnathopod 1, long article 2 of antenna 1, constricted inner ramus of uropod 2; and see Parambasia. From Lysianassa in the dominant epistome in the prebuccal mass. From Adelieilia in the elongate article 2 of antenna 1, constricted inner ramus of uropod 2, large dactyl of the maxilliped and absence of molar. From Nannonyx in the unexpanded peduncle of uropod 3, broad plates of maxilla 2, larger dactyl on the maxilliped and the coalesced urosomites 2-3. From Microlysias in the slender articles on the peduncle of antennae 2. From Paraualdekeia in the long inner ramus of uropod 3. From Paralyssianopsis in the blunt (not sharp) prebuccal mass, broad plates of maxilla 2, proximal position of the mandibular palp and the 1-articulate outer ramus of uropod 3. From Socarnella in the longer article 2 of antenna 1, lack of tooth on articles 1-2 of antenna 1 and the unnotched telson. From Pronannonyx in the longer palp of the maxilliped, unexpanded peduncle of uropod 3, equal rami of uropod 3, unconstricted inner ramus of uropod 2 and probably the broader plates of maxilla 2.

Species. Pseudambasia rossii Stephensen, 1927a (=P. bipartita Stephensen, 1927a) (Lowry & Stoddart, 1983a) [850].

Habitat and distribution. Marine, southern New Zealand and outliers, 0-25 m, 1 species.

Pseudoanonyx Kudrjaschov

Pseudoanonyx Kudrjaschov, 1965a: 515.

Type species. Pseudoanonyx caecus Kudrjaschov, original designation.

Diagnosis. Mouthparts forming quadrate bundle. Labrum and epistome [separate, labrum slightly dominant in projection, blunt]. Incisor ordinary, mole
simple, large, conicolaminate or subconical, setulose; palp attached opposite molar. Inner plate of maxilla 1 weakly (2) setose (setae large); palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp slightly exceeding outer plate, dactyl small, tumid but weakly unguiform. Coxa 1 large and visible, not tapering. Gnathopod 1 short, poorly subchelate, palm transverse, almost chelate, article 5 subequal to 6, lobate, dactyl very small; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely chelate, dactyl very small. Inner ramus of uropod 2 without notch. Uropod 3 ordinary, peduncle ordinary, inner ramus slightly shortened, outer ramus 2-articulate. Telson elongate, deeply cleft.

Additional characters. Dactyl of maxilliped short and tumid; propodus of gnathopod 1 like typical lysianassid gnathopod 2; pereopods 3-4 without locking spines.

Relationship. Characterised by the reduced dactyl of gnathopod 1, with gnathopod 1 thus resembling gnathopod 2, and the reduced and tumid dactyl on the maxilliped.

Like Anonyx but gnathopod 1 minutely chelate and similar to gnathopod 2, and locking spines on pereopods 3-4 absent.

Differing from Pachynus in the elongate cleft telson.

Vaguely similar to Gainella but molar not ridged, palp opposite molar, inner plates of maxilliped not styliform and inner ramus of uropod 3 well developed.

Technically like scopelocheirins in gnathopod 1 but differing from all of those genera in the tumid dactyl of the maxilliped, and the stout gnathopod 1 with minutely chelate palm like a misplaced gnathopod 2.

Differing from Centromedon in the better developed gnathopod 1 and apically expanded coxa 1. From Paronesimus in the elongate telson, reduced dactyl of gnathopod 1 and tumid, reduced dactyl of the maxilliped. From Orchomene in the reduced dactyl of gnathopod 1.

Species. *Pseudoanonyx caecus* Kudrjaschov, 1965a [282].

Habitat and distribution. Marine, Okhotsk Sea, Penzhinskaya Gulf, 124 m, 1 species.

**Pseudocyphocaris** Ledoyer

*Pseudocyphocaris* Ledoyer, 1986: 82.

Type species. *Pseudocyphocaris caulis* Ledoyer, 1986, original designation.

Diagnosis. Of cyphocarin form, head tall, horizontally short, grotesque. Flagella of antennae short, base of flagellum on antenna 1 essentially not conjoint, accessory flagellum small. Mouthparts forming quadrate bundle. Labrum and epistome apparently fused together, strongly projecting. Incisor ordinary, molar absent, palp poorly setose, attached strongly proximal to molar. Inner plate of maxilla 1 naked; palp (2-articulate), large. Inner and outer plates of maxilliped well developed, palp feeble, barely exceeding outer plate, dactyl absent. Coxa 1-3 small, strongly shortened and fully covered by coxa 4, latter large and visible, strongly lobate and excava, coxa 5 usually medium-small. Gnathopod 1 short, simple, articles 5 and 6 subequal, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, both elongate and linear, propodus minutely subchelate. Uropod 3 small, peduncle elongate, inner ramus slightly shortened, outer ramus 1-articulate. Telson slightly elongate, entire.

Additional characters. Calceoli unknown (only female known). Article 2 of pereopods 5-7 diverse, linear (5), weakly expanded (6), broadly shield-shaped (7); outer rami of uropods 1-2 with deep notch.

Relationship. *Pseudocyphocaris* joins Cyphocaris because coxa 3 is as small as coxae 1-2 and covered by coxa 4; in other cyphocarins coxa 3 is large. But *Pseudocyphocaris* is distinctive in the thin article 2 of pereopod 5, the proximal mandibular palp, the naked inner plate of maxilla 1, unclift telson, unequal rami of uropod 3, simple pereopods, and absence of calympophore on flagella of antennae.

Differing from *Crybelocyphocaris* in the small coxa 3, short inner ramus of uropod 3, and notched 1-articulate outer ramus of uropod 3.


Habitat and distribution. Marine, Indian Ocean, Walters Bank, 40-43 m, epipelagic, 1 species.

**Pseudokoroga** Schellenberg

*Pseudokoroga* Schellenberg, 1931: 16.

Type species. *Pseudokoroga barnardi* Schellenberg, 1931, monotypy.

Diagnosis. Mouthparts forming quadrate bundle, weakly styliform. Labrum and epistome prominent, separate, epistome dominant in size and projection, blunt. Incisor ordinary, molar weakly triturative, of medium size, also setulose; palp attached strongly proximal to molar. Inner plate of maxilla 1 weakly (2) setose; palp 2-articulate, large. Inner moderately and outer plates of maxilliped well developed, palp strongly exceeding...
outer plate, dactyl well developed. Coxa 1 large and visible, not tapering. Gnathopod 1 in male strongly enlarged, strongly subchelate, palm transverse, article 5 much shorter than 6, lobate, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 without notch. Uropod 3 short, peduncle slightly elongate, inner ramus slightly shortened, outer ramus 2-articulate. Telson ordinary, entire or emarginate.

Additional characters. Plates of maxilla 2 and maxilliped very thin (versus Koroga), inner plate of maxilla 2 almost as long as outer (versus Koroga) coxa 1 not expanded anteroventrally (versus Koroga).

Relationship. Differing from Koroga in the moderately well-developed and triturative molar, thinner plates of maxilla 2, with the inner plate almost reaching the apex of the outer plate, in the shorter dactyl of the maxilliped, the apically unexpanded coxa 1, smaller head and the presence of a notch on the inner ramus of uropod 2. From Orchomene in the expanded propodus of gnathopod 1.

See Rimakoroga.


Species. Pseudokoroga barnardi Schellenberg, 1931 [831].

Habitat and distribution. Marine, Falkland Islands, 40 m, 1 species.

Pseudonesimoides Bellan-Santini & Ledoyer


Type species. Pseudonesimoides cornutilabris Bellan-Santini & Ledoyer, 1974, original designation.

Diagnosis. Mouthparts forming slightly conical bundle. Labrum and epistome continuous, not differentially produced, coalesced, blunt. Incisor ordinary, molar absent; palp attached strongly proximal. Inner plate of maxilla 1 weakly (2) setose; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp not exceeding outer plate, dactyl well developed. Coxa 1 slightly shortened and tapering, mostly visible. Gnathopod 1 short, palm poorly chelate, article 5 shorter than 6, lobate, dactyl large; article 6 of gnathopod 2 slightly shorter than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 with small notch. Uropod 3 short, peduncle expanded, plate-like, inner ramus absent, outer ramus, short, 1-articulate. Telson ordinary, entire, subtriangular.

Additional characters. Ocular lobe thick and long (versus Paronesimoides); antennae very short, antenna 1 scarcely exceeding ocular lobe, flagella sparsely articulate; rakers present; following edges with very thick spines: apex of outer lobe of lower lip (1 spine); palp of maxilla 1; apex of inner and medial margin of outer plate on maxilliped; dactyl of maxilliped thin and sharp (versus Derjugiana); peduncle of uropod 3 with apicomedial hump.

Sexual dimorphism. Males smaller than females (only distinction).

Relationship. Differing from Onesimoides in uropod 3 bearing only 1 ramus, carpus of gnathopod 1 shorter than propodus, and shorter article 1 of primary flagellum on antenna 1. From Paronesimoides in the short maxillipedal palp, thick ocular lobe, short article 2 of antenna 1, lack of molar, and 1-articulate outer ramus of uropod 3. From Derjugiana in the thin maxillipedal dactyl, presence of rakers, broader plates of maxilla 2, short antennae and much less styliform mandible.

Species. Pseudonesimoides cornutilabris Bellan-Santini & Ledoyer, 1974 (Lowry & Stoddart, 1983a) [810].

Pseudornochomene Schellenberg

Fig.92Z


Type species. Orchomenopsis coatsi Chilton, 1912, monotypy.

Diagnosis. Mouthparts forming quadrate bundle. Labrum and epistome differentially produced, separate, labrum slightly dominant in size and projection, blunt. Incisor ordinary, molar triturative, large; palp attached slightly proximal to corner of molar. Inner plate of maxilla 1 weakly (2) setose; palp 2-articulate, large, apex spinose. Inner and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl well developed. Coxa 1 large and visible, not tapering. Gnathopod 1 greatly elongate, nearly simple, palm short and transverse, tuberculate, articles 5 and 6 subequal, both very elongate and linear, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 without notch. Uropod 3 ordinary, peduncle ordinary, inner ramus slightly shortened, outer ramus 2-articulate. Telson elongate, deeply cleft.

Additional characters. Article 1 of accessory
flagellum elongate and primary flagellum with callynophore in both sexes; article 3 of gnathopod 1 elongate; rami of uropod 3 setose in both sexes.

Sexual dimorphism. Males with calceoliferous antennae.

Relationship. Characterised by the elongate articles 3, 5 and 6 of gnathopod 1, setose rami of uropod 3 in both sexes, large callynophore of primary flagellum on antenna 1, weakly proximal mandibular palp, and deeply cleft telson.

Differing from Orchomene in the long linear articles of gnathopod 1, more distally placed mandibular palp and presence of plumose setae on the rami of uropod 3 in both sexes. From Hippomedon in the larger head not covered by coxa 1. From Tryphosella in the immediate molarial position of the mandibular palp. From Socarnes in the elongate articles of gnathopod 1, and the larger article 1 of the primary flagellum. From Waldeckia in the slightly subchelate gnathopod 1, less proximal mandibular palp, longer carpus of gnathopod 1, much smaller lobe of coxa 4 (huge in Waldeckia), thus base of pereopod 5 hidden, larger article 1 on the primary flagellum of antenna 1, elongate article 3 of gnathopod 1, and stronger spines on the palp of maxilla 1. From Socarnella in the longer gnathopod 1, with longer article 6, the 2-articulate outer ramus of uropod 3, and the slightly subchelate gnathopod 1. From Psammonyx and Menigratopsis in the elongate gnathopod 1 with elongate article 3. From Socarnopsis in the 2-articulate outer ramus of uropod 3, and elongate articles 3, 5, 6 of gnathopod 1.

Species. Pseudorchomene coatsi (Chilton, 1912) (Nicholls, 1938) (Lowry & Stoddart, 1983a) (Andres, 1983) [870 + B].

Habitat and distribution. Marine, Antarctic Sea, 50-295 m, often coming to baited traps, 1 species.

Rhinolabia Ruffo


Type species. Rhinolabia parthenopeia Ruffo, 1971, original designation.

Diagnosis. Mouthparts forming quadrate bundle. Labrum and epistome ['separate, neither dominant in size nor projection, blunt]. Incisor ordinary; molar triturative, large, palp attached opposite molar. Inner plate of maxilla 1 ['weakly setose; palp 2-articulate, large]. Inner and outer plates of maxilliped well developed, palp scarcely exceeding outer plate, dactyl small, stubby. Coxa 1 large and visible, not tapering. Gnathopod 1 short, nearly simple, palm oblique, articles 5 and 6 subequal, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 without notch. Uropod 3 ordinary, peduncle slightly elongate, inner ramus slightly shortened, outer ramus 2-articulate. Telson ordinary, entire but emarginate.

Additional characters. Outer plate of maxilla 1 with 11 spines in 2 kinds of 7 + 4; pereopod 6 as long as 5, thus articles 4-6 longer and thinner than on pereopod 5, article 2 with anteroventral and posteroventral lobes.

Relationship. Differing from Lysianassa and related genera in the undivided prebuccal mass, the shape of pereopod 6 (see 'Additional characters'), the elongate dactyls of pereopods 6-7 and the elongate outer ramus on article 2 of the outer ramus on uropod 3. From Parawaldeckia in the long inner ramus of uropod 3. From Paralysianopsis in the simple gnathopod 1, unconstricted inner ramus of uropod 2 and the blunt prebuccal mass. From Pseudorchomene in the simple gnathopod 1, short article 3 of gnathopod 1, uncliffed telson, and in the reversed dominance of the labrum and epistome. From Parambasia in the unconstricted inner ramus of uropod 2, the 2-articulate outer ramus of uropod 3, presence of a molar, deep anterior lobe on article 2 of pereopod 6, and the dominance of the labral part of the fused prebuccal mass.

See Lysianella.

Species. Rhinolabia parthenopeia Ruffo, 1971 (Ledoyer, 1977) [348].

Habitat and distribution. Marine, Mediterranean Sea, 35-120 m, 1 species.

Rifcus Kudrijaschov


Type species. Rifcus auspicatus Kudrijaschov, 1965a, original designation.

Diagnosis. Mouthparts forming quadrate bundle. Labrum and epistome ['separate, neither dominant in size nor projection, blunt]. Incisor ordinary; molar triturative, large, palp attached opposite molar. Inner plate of maxilla 1 ['weakly setose; palp 2-articulate, large]. Inner and outer plates of maxilliped well developed, palp scarcely exceeding outer plate, dactyl small, stubby. Coxa 1 large and visible, not tapering. Gnathopod 1 short, poorly subchelate, palm oblique, articles 5 and 6 subequal, dactyl large; article 6 of gnathopod 2 slightly shorter than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 without notch. Uropod 3 ordinary, peduncle ordinary, inner ramus slightly

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shortened, outer ramus 2-articulate. Telson ordinary, weakly cleft.

Additional characters. Outer plate of maxilla 1 with 5 spines (versus Tryphosoides); palp of maxilliped very stout and short, barely exceeding outer plate (versus Boeckosimus).

Relationship. Differing from Anonyx in the triturative molar. From Boeckosimus and Onisimus in the very stout maxillipedal palp, with the outer plate reaching nearly to end of palp article 3. From Hippomedon in the short telson and stubby dactyl on the maxillipedal palp.

See ‘Additional characters’.

Species. Rifcus auspicatus Kudrijaschov, 1965a [282].

Habitat and distribution. Marine, north part of west Kamchatka shelf, depth unknown, 1 species.

Rimakoroga Barnard & Karaman


Type species. Pseudokoroga rima J.L. Barnard, 1964a, original designation.

Diagnosis. Mouthparts forming quadrate bundle. Labrum and epistome prominent, separate, epistome slightly dominant in size and projection, blunt. Incisor ordinary, molar weakly triturative, of medium size, also setulose; palp attached strongly proximal to molar. Inner plate of maxilla 1 [‘weakly (2) setose’]; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl well developed. Coxa 1 large and visible, not tapering. Gnathopod 1 in male strongly enlarged, strongly subchelate, palm transverse, article 5 much shorter than 6, lobate, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 without notch. Uropod 3 ordinary, peduncle ordinary, inner ramus slightly shortened, outer ramus 2-articulate. Telson ordinary, weakly to deeply cleft.

Additional characters. Primary flagellum of antenna 1 with 5 articles only; terminal male gnathopod 1 with carpus very short, lobe thin, propodus enormous, palm and hind margin continuous (as in Ischyrocerus), dactyl immense and folding back on false palm; epimeron 3 weakly serrate.

Sexual dimorphism. Female gnathopod 1 small but thick, carpus short and lobate, hand subrectangular, palm almost transverse, dactyl fitting palm; otherwise antennae, eyes and uropod 3 similar between the sexes.

Relationship. Differing from Pseudokoroga in the cleft telson and unconstructed inner ramus of uropod 2. From Orchomene in the inflated article 6 of male gnathopod 1, in the terminal male this propodus developing massively, palm and hind margin contiguous, dactyl huge and folding back on false palm. From Koroga in the cleft telson, strongly transformed gnathopod 1 of the terminal male and the better developed molar.

Species. Rimakoroga rima (J.L. Barnard, 1964b,e, 1966a) [370].

Habitat and distribution. Marine, southern California and west Mexico, 2-30 m, 1 species.

Schisturella Norman

Fig.92C

Pseudonesimus Chevreux, 1926a: 3 (Pseudonesimus abyssi Chevreux, 1926a, monotypy).
Thrombasia J.L. Barnard, 1966a: 72 (Thrombasia tracalo J.L. Barnard, 1966a, original designation).

Type species. Tryphosa pulchra Hansen, 1887, monotypy.

Diagnosis. Mouthparts forming quadrate bundle. Labrum and epistome differentially produced, prominent, separate, labrum strongly dominant in projection, blunt. Incisor ordinary, molar weakly triturative, large, also setulose; palp attached opposite molar. Inner plate of maxilla 1 weakly (2) setose; outer plate with 7 spines; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl well developed. Coxa 1 large and visible, not tapering. Gnathopod 1 in male strongly enlarged, strongly subchelate, palm transverse, article 5 much shorter than 6, lobate, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 without notch. Uropod 3 ordinary, peduncle ordinary, inner ramus slightly shortened, outer ramus 2-articulate. Telson ordinary, weakly to deeply cleft.

Additional characters. Primary flagellum of antenna 1 with 5 articles only; terminal male gnathopod 1 with carpus very short, lobe thin, propodus enormous, palm and hind margin continuous (as in Ischyrocerus), dactyl immense and folding back on false palm; epimeron 3 weakly serrate.

Sexual dimorphism. Female gnathopod 1 small but thick, carpus short and lobate, hand subrectangular, palm almost transverse, dactyl fitting palm; otherwise antennae, eyes and uropod 3 similar between the sexes.
Variables. Antenna 1 apex of flagellum article 1 with large spine \((S. 
\text{pulchra})\); mandibular molar poorly triturative and well setulose \((S. \text{tracalero}) \) \((S. \text{totorami}) \), palp article 3 very short \((S. \text{zopa}) \) \((S. \text{grabenensis}) \); coxa 1 variable, short or long, quadrate or triangular, but coxa 1 also slightly elongate \((S. \text{tracalero}) \); gnathopod 1 simple \((S. \text{adversicola}), S. \text{rotundatus}, S. \text{dorothaeae})\), almost simple \((S. \text{coca})\), subchelate, palm transverse \((S. \text{zopa}) \) \((S. \text{robusa}) \) \((S. \text{abyss}) \); telson deeply cleft \((\text{type}, \text{etc})\), cleft 1/3 \((S. \text{adversicola}, \text{etc})\).

Relationship. Metambasia differing from Schisturella and Ambasiopsis primarily in complete loss of palm in gnathopod 1.

Differing from Ambasiopsis in the strong notch on the inner ramus of uropod 2, stronger medial setation on maxilla 2, and lack of major dorsal hump or tooth on urosomite 1. The type species of Ambasiopsis has no apical spines on the outer plates of the maxillipeds. The type species of Schisturella has many distal spines. Usually Ambasiopsis has a stout gnathopod 1 and maxilla 2, and lack of major dorsal hump or tooth on urosomite 1. The type species of Ambasiopsis has no Galathella; S. parachelata Ledoyer, 1986, to Aristiopsis. cocula J.L. Barnard, Triturator and well large spine \((S. \text{pulchra})\); mandibular molar poorly triturative; labrum, epistome forming quadrate bundle, some styliform. Labrum and epistome continuous, coalesced, blunt. Incisor ordinary, molar simple, small, or absent; palp attached strongly proximal. Inner plate of maxilla 1 \([?\text{not setose}]\); palp 1-articulate, small. Inner poorly and outer plates of maxilliped well developed, palp scarcely or not exceeding outer plate, dactyl small. Coxa 1 large and visible, not tapering. Gnathopod 1 short, simple, article 5 \([?\text{shorter than 6}]\), dactyl large; article 6 of gnathopod 2 shorter than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 without notch. Uropod 3 short, rami absent. Telson hemiaceabulate, emarginate.

Additional characters. Head visible; accessory flagellum 2-articulate; rakers present; inner plate of maxilla 1 broad, subquadrate, outer plate narrow and tapering; inner plate of maxilliped short, broad, apically toothed, outer plate tapering distally, inner margin serrate; article 4 of pereopods 5-7 strongly expanded posteriorly, article 5 of pereopods 5-7 short; rami of uropods 1-2 subequal; telson multispinose.

Sexual dimorphism. Oostegites absent, female with penial processes, thus protandrously hermaphroditic.

Relationship. Differing from Stomacontion in the medially serrate outer plate of the maxilliped and the broad inner plate with apical teeth.

Notes on distribution. Various authors, except Ledoyer, have failed to note depths of distribution for this species.


Habitat and distribution. Marine, Suez canal to Darwin, Australia, ?-24 m, 1 species.

Scopelocheiropsis Schellenberg

Fig.91R

Scopelocheiropsis Schellenberg, 1926a: 260.

Type species. Scopelocheiropsis abyssalis Schellenberg, 1926a, monotypy.

Diagnosis. Of scopelocheirin form. Mouthparts forming quadrate bundle. Labrum and epistome differentially produced, prominent, separate, both strongly produced, blunt. Incisor ordinary, molar absent; palp attached strongly distal. Inner plate of maxilla 1

Scopelocheiropsis Lowry & Stoddart


Type species. Stomacontion prionoplax Monod, 1937, original designation.
strongly (9) setose; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp slightly exceeding outer plate, dactyl vestigial. Coxa 1 large and visible, not tapering. Gnathopod 1 elongate, nearly simple, palm oblique, articles 5 and 6 subequal, dactyl vestigial, shrouded in setae; article 6 of gnathopod 2 slightly shorter than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 without notch. Uropod 3 ordinary, peduncle ordinary, inner ramus slightly shortened, outer ramus 2-articulate. Telson ordinary, deeply cleft.

Additional characters. Outer plate of maxilliped reaching apex of palp article 2 (versus Scopelocheirus); coxae short (compared to Scopelocheirus type); pereopods 3-4 especially strong, article 5 vestigial and lobate; pereopods 3-7, especially 3-4, weakly prehensile; article 2 of pereopod 5 slender, article 4 of pereopods 5-7 hardly expanded; outer ramus of uropod 2 (less so on uropod 1) much shorter than inner ramus; article 2 on outer ramus of uropod 3 half as long as article 1.

Relationship. Differing from Scopelocheirus in the short coxae, shorter reach on the outer plate of the maxilliped, vestigial dactyl of maxilliped, non-chelate gnathopods 2, strong pereopods 3-4, and thin articles 2 and 4 on pereopods 5-7.

Species. Scopelocheiropsis abyssalis Schellenberg, 1926a,c (?Birstein & Vinogradov, 1962b) [426A + 870B].

Habitat and distribution. Marine, North and South Atlantic, ?Antarctica; in tows 0-3000 m depth, 1 species.

Scopelocheirus Bate

Figs 89G, 90U, 91D, 92V, 93F


Type species. Callisoma hopei Costa, 1851-1853, selected by Boeck, 1876.

Diagnosis. Of scopelocheirin form. Mouthparts forming quadrate bundle. Labrum and epistome differentially produced, prominent, separate, epistome slightly dominant in size and projection, blunt. Incisor ordinary, molar simple, large, conicollaminae or subconical, setulose; palp attached opposite molar. Inner plate of maxilla 1 strongly setose medially; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl well developed. Coxa 1 large and visible, not tapering. Gnathopod 1 elongate or short, nearly simple, palm oblique, articles 5 and 6 subequal, dactyl vestigial, shrouded in setae; article 6 of gnathopod 2 slightly shorter than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 without notch. Uropod 3 almost aquiramous, ordinary, peduncle ordinary, outer ramus 2-articulate. Telson elongate, deeply cleft.

Additional characters. Inner plate of maxilla 2 strongly setose medially; outer plate of maxilla 2 narrower than inner (or not broader).

Sexual dimorphism. Male article 1 on primary flagellum of antenna 1 with callynophore.

Variables. Epistome not protruding (S. pacifica = S. schellenbergi, etc.); maxilla 1 possibly with special seta of Aroui (S. polymedus); apex of outer plate on maxilliped naked (type, etc.), widely setose (S. pacifica = S. schellenbergi); coxae 1-4 short (S. schellenbergi); gnathopod 1 elongate (S. hopei, etc.), short (S. schellenbergi), lengths of articles 5-6 on gnathopod 1 variable (see Lincoln, 1979a); article 4 of pereopod 5 broad (S. hopei, S. crenata), slender (S. schellenbergi); article 2 of pereopods 6-7 excavate posteroventrally (S. abyssi); rami of uropods 1-2 much shorter than peduncle (S. schellenbergi); telson shorter than type (S. schellenbergi).

Relationship. Aroui differing from Scopelocheirus in presence of large ciliate seta on palp apex of maxilla 1, outer plate of maxilla 2 much broader than inner plate and apex truncate; in adults coxae 1-4 densely and finely setose ventrally, apices of these setae hooked (and see Stroobants, 1976). Differing from Eucallisoma, Paracallisoma and Paracallisomopsis, in the chelate gnathopod 2.


Habitat and distribution. Marine, cosmopolitan, cold shallow water or deep sea, bathy- and abyssopelagic, 20-6000+ m (wire out 0-7000, 0-8000 m, etc.), 5 species.
Septcarnes n.gen.

Type species. Socarnes septimus Griffiths, 1975, here selected.

Etymology. From roots of Socarnes and septicus.

Diagnosis. Mouthparts forming conical bundle, some styliform. Labrum and epistome not differentially produced, prominent, separate, both produced together, blunt. Incisor ordinary, molar weakly triturative, or simple, large, somewhat conicoaminate, and setulose; palp attached proximal to molar. Inner plate of maxilla 1 (?weakly (?) setose; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl well developed. Coxa 1 large and visible, not tapering. Gnathopod 1 short, simple, articles 5 and 6 subequal, dactyl large; article 6 of gnathopod 2 slightly shorter than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 without notch. Uropod 3 aequiramous, ordinary, peduncle ordinary, outer ramus 1-articulate. Telson ordinary, deeply cleft, flat.

Additional characters. Head visible; rakers absent; inner plate of maxilliped small, styiliform; article 2 of pereopods 5-7 strongly expanded posteriorly.

Relationship. Very close to Acidostoma but palp of maxilla 1 not reduced, outer ramus of uropod 3 lacking article 2, and coxa 1 slightly elongated and exceeding coxae 2-3.

Species. Shackletonia robusta K.H. Barnard, 1931a, 1932 [890B].

Habitat and distribution. Marine, South Shetland and South Georgia, 250-342 m, 1 species.

Sheardella Lowry

Sheardella Lowry, 1984b: 54.

Type species. Sheardella kapala Lowry, 1984b, original designation.

Diagnosis. Of pachynin form. Mouthparts forming conical bundle, some parts styliform. Labrum and epistome (?continuous), not differentially produced, not prominent, blunt. Incisor ordinary, molar absent; palp attached slightly proximal to middle of body. Inner plate of maxilla 1 moderately (5) setose; palp 1 or 2-articulate, small. Inner poorly and outer plates of maxilliped well developed, palp not exceeding outer plate, dactyl well developed. Coxa 1 large and visible, not tapering. Gnathopod 1 enlarged, poorly subchelate, palm oblique, article 5 very short, narrow, with long posterior protrusion, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely subchelate. Inner ramus of uropod 2 without notch. Uropod 3 short, peduncle ordinary, inner ramus absent, outer ramus 1-articulate. Telson short, entire.

Additional characters. Base of flagellum on antenna 1 articular; mandible lacking toothed blade, with rakers, lacinia mobilis absent; outer plate of maxilla 1 spines sculptured, palp with terminal setae, plates of maxilla 2 slender, very unequal; coxa 4 with large posteroventral lobe; gnathopod 1 palm defined by simple spine; pereonite 5 lacking dorsal tooth.

Variables. Palp of maxilla 1 1- or 2-articulate.

Relationship. Differing from Drummondia and
Prochynella in the presence of a palp on maxilla 1, raker spine on the mandible, lack of dorsal tooth on perconite 5 and lack of inner ramus on uropod 3.


**Habitat and distribution.** Marine, south-eastern Australia from Port Jackson to Western Port, 3-92 m, 2 species.

*Shoemakerella* Pirlot

*Shoemakerella* Pirlot, 1936b: 264 [but based on *cubensis* by Pirlot on assumption *cubensis* is junior synonym to *nasuta*].

Type species. *Lysianassa nasuta* Dana, 1853, original designation.

**Diagnosis.** Mouthparts forming a quadrate bundle. Labrum and epistome differentially produced, prominent, separate, labrum strongly dominant in size and projection, blunt. Incisor ordinary, molar simple, small, conicolaminate, subconical, setulose; palp attached strongly proximal to molar. Inner plate of maxilla 1 not setose; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palparticle 2 not exceeding outer plate, dactyl well developed. Coxal 1 large and visible, not tapering. Gnathopod 1 short, simple, articles 5 and 6 subequal, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely subchelate. Inner ramus of uropod 2 with small or no notch. Uropod 3 almost acquiramous, ordinary, peduncle slightly elongate, outer ramus 1-articulate. Telson ordinary, weakly cleft or emarginate.

**Additional characters.** *Shoemakerella cubensis* outer plate of maxilla 1 shown to have only 7 spines (but needs confirmation); gills pleated on *S. cubensis*; terminal male uropod 3 with notch on peduncle.

**Sexual dimorphism.** Not studied.

**Variables.** Not studied.

**Relationship.** Differing from *Aruga* and *Lysianopis* in broad inner plate of maxilla 2, and no article 2 on uropod 3 outer ramus. From *Lysianassa* in lack of tooth on antenna 1. There are no confirmed differences from *Aruga.*

Species. *Shoemakerella cubensis* (Stebbing, 1897) (? = *S. nasuta*) (including *Lysianopis alba* identifications of Pearse, 1912, Shoemaker, 1921; including *S. nasuta* identifications of Pirlot, 1936b, 1939, Shoemaker, 1948) (Shoemaker, 1935a) (Hurley, 1963) [470]; 5 *S. nasuta* (Dana, 1853) (Hurley, 1963) [751].

**Habitat and distribution.** Marine, *S. nasuta* type locality = Rio de Janeiro; *S. cubensis* = Cuba; Caribbean and Gulf of Mexico, 7-18 m, 72 species.

*Socarnella* Walker

*Socarnella* Walker, 1904: 239.

**Type species.** *Socarnella bonnieri* Walker, 1904, monotype.

**Diagnosis.** Mouthparts forming a quadrate bundle. Labrum and epistome [continuous, not differentially produced, not prominent, coalesced, blunted]. Incisor [ordinary, if 'as in *Amarylis* then minutely toothed; molar simple, small, setulose]; palp attached strongly proximal to molar. Inner plate of maxilla 1 weakly (2) setose; palp 2-articulate, large. Inner poorly and outer plate of maxilliped well developed, palp strongly exceeding outer plate, dactyl small to vestigial. Coxal 1 large and visible, not tapering. Gnathopod 1 short, simple, articles 5 and 6 subequal, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely subchelate. Inner ramus of uropod 2 with small or no notch. Uropod 3 almost acquiramous, ordinary, peduncle slightly elongate, outer ramus 1-articulate. Telson ordinary, weakly cleft or emarginate.

**Additional characters.** Article 1 of antenna 1 with weak apicoventral tooth; inner plate of maxilliped with at least one large apical tooth, dactyl reduced; notch on inner ramus of uropod 2 in type reduced but with large spine; uropod 2 with many spines on outer ramus (type).

**Sexual dimorphism.** Male eyes enlarged; articles 4-5 of peduncle on antenna 2 thick, flagellum elongate and calceolate; uropod 3 setose and article 2 on outer ramus vestigial or absent.

**Relationship.** Poorly described. Differing from *Socarnoides* in the weak or absent notch on the inner ramus of uropod 3. From *Socarnes* in the 1-articulate outer ramus of uropod 3, poor cleft of telson, and weak dactyl of the maxilliped. From *Socarnopsis* in the poorly cleft telson; and different properties of mandibular palp (see Hurley, 1963). From *Lysianassa* in the reduced dactyl of the maxillipedal palp. See *Bonassa.*


**Habitat and distribution.** Marine, Sri Lanka (e.g. Ceylon) and south-east India, shallow water, 1 species.
Socarnes Boeck


**Type species.** Lysianassa vahlii Krøyer, *1838b*, monotypy.

**Diagnosis.** Mouthparts forming quadratic bundle. Labrum and epistome differentially produced, prominent, separate, labrum strongly dominant in size and projection, blunt. Incisor ordinary, molar simple, small, subconical, setulose; palp attached strongly proximal to molar. Inner plate of maxilla 1 weakly (2) setose; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl well developed. Coxa 1 covered by large and visible, not tapering, Gnathopod 1 short, simple, articles 5 and 6 subequal, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus subchelate or chelate. Inner ramus of uropod 2 without notch. Uropod 3 ordinary, peduncle ordinary, inner ramus slightly shortened, outer ramus 2-articulate. Telson elongate, deeply cleft.

**Additional characters.** Article 1 of primary flagellum on antenna 1 not longer than article 3 of peduncle (versus *Menigrates*); ratio of mandibular palp articles 1-3 = about 33-155-90 (type) (versus type of *Socarnopsis*); outer plate of maxilliped not exceeding article 2 of palp (versus *Socarnopsis*); gills heavily triturative, palp strongly projecting, blunt. Incisor ordinary, molar weakly incised (S. b. japonicus).

**Sexual dimorphism.** Male antenna 2 elongate, articles 4-5 of peduncle thick and short, some species like *S. allecta* and *S. dissimulantia* males with article 1 of primary flagellum antenna 1 elongate and rest of flagellum heavily armed.

**Variables.** Mandibular palp only slightly proximal (S. hartmani); mandibular palp aberrant, ratio = 5:13:19 (S. morhibanensis); inner plate of maxilla 1 with only 1 seta (S. hartmani); gnathopod 2 chelate (S. hartmani); epimeron 3 broadly rounded-truncate (type) with large tooth bearing basal notch (S. hartmani); uropod 2 inner ramus slightly incised (S. b. japonicus).

**Relationship.** Differing from *Lysianassa* in the deeply cleft telson. From *Ichnopus* in lack of setal brush on dactyl of gnathopod 1, proximal position of mandibular palp and well-developed labral dominance. From *Socarnella* and *Socarnopszs* (but Lincoln, 1979a, says = 2) in outer ramus of uropod 3 = 2-articulate. From *Socarnopszs* in longer article 2 of mandibular palp. From *Waldeckia* in pleated gills. From *Menigrates* in deeply cleft telson, much shorter article 1 of primary flagellum on antenna 1 in female and prominent prebuccal process. From *Concarnees* in lack of incision on inner ramus of uropod 2 and non-expanded peduncle of uropod 3. See *Septcarnes*.

**Problems.** Resolution of the *Socarnes*-*Socarnoides*- *Socarnella*- *Socarnopsis* problem elucidated by Hurley (1963) not yet concluded; *Socarnes bidenticulatus japonicus* bearing weak incision on inner ramus of uropod 2, contrary to diagnosis; *Socarnopsis* = *Socarnes* because Lincoln (1979a) showing article 2 of uropod 3 outer ramus present but Chevreux & Fage (1925) showing it absent.


**Distribution note.** Largely Northern Hemisphere south to South Africa, replaced in Antarctic by very closely related *Waldeckia*.


**Habitat and distribution.** Marine, northern hemisphere south to Dakar and California, 0-265 m, 75 species.

*Socarnoides* Stebbing

Figs 88E, 89M


**Type species.** *Socarnoides kergueleni* Stebbing, *1888*, monotypy.

**Diagnosis.** Said to be of conicostomin form. Mouthparts said to be forming 'conical bundle'. Labrum and epistome prominent, separate, both large and strongly projecting, blunt. Incisor ordinary, molar weakly triturative, to some extent conicolaminate, setulose, palp attached strongly proximal to molar. Inner plate of maxilla...
1 weakly (0-1) setose; palp 2-articulate, large. Inner poorly and outer plate of maxilliped well developed, palp not exceeding outer plate, dactyl small. Coxa 1 large and visible, slightly tapering. Gnathopod 1 short, simple, articles 5 and 6 subequal, dactyl small; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 with large notch. Uropod 3 short, peduncle elongate, inner ramus slightly shortened, outer ramus 2-articulate. Telson ordinary, longer than broad, flat, weakly cleft.

Additional characters. Head visible; rakers present; palp of maxilla 1 well developed but 1-articulate; outer plates of maxilliped acutely pointed; peduncle of uropod 3 forming apicolateral plate.

Variables. Upper lip projecting beyond epistome, latter not lobate (S. illudens, S. eugenovi); maxillipedal palp exceeding outer plate (S. illudens, S. eugenovi); carpus of gnathopod 1 weakly lobate (S. illudens, S. eugenovi); palp of maxilla exceeding outer plate (S. illudens, S. eugenovi); palp of maxilla 1 and 2-articulate, palp scarcely exceeding outer plate, dactyl well developed. Coxa 1 large and visible, not tapering. Gnathopod 1 short, simple, articles 5 and 6 subequal, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 without notch. Uropod 3 auricolate, outer plate slightly elongate, outer ramus 2-articulate [confirmed by Dr R. Lincoln]. Telson elongate, deeply cleft.

Relationship. Difficult to judge as a conicostomatin because of the plate-like peduncle of uropod 3, carpus of gnathopod 1 weakly lobate (S. illudens, S. eugenovi).


Habitat and distribution. Marine, type species: Antarctic and Kerguelen, 5-325 m; others: Magellanic, 9 m; North Pacific and Kara Sea, 37-156 m; 4 species.

Socarnopsis Chevreux

Socarnopsis Chevreux, 1911d: 164.

Type species. Socarnopsis crenulata Chevreux, 1911d, monotypy.

Diagnosis. Mouthparts forming quadrate bundle. Labrum and epistome differentially produced, prominent, separate, both produced together, blunt. Incisor ordinary, molar weakly or not triturative, large, slightly conico-plate, also setulose, palp attached slightly proximal to molar. Inner plate of maxilla 1 weakly (2) setose; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp scarcely exceeding outer plate, dactyl well developed. Coxa 1 large and visible, not tapering. Gnathopod 1 short, simple, articles 5 and 6 subequal, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 without notch. Uropod 3 auricolate, outer plate slightly elongate, outer ramus 2-articulate [confirmed by Dr R. Lincoln]. Telson elongate, deeply cleft.

Additional characters. 'Epistome protruding over upper lip; antenna 1 primary flagellum base with callynomph in both sexes; mandibular palp ratio 30-90-60 (versus Socarnes). Species. Socarnopsis, Socarnes (Socarnes = 33-155-90); outer plate of maxilliped reaching well along article 3 of palp (versus Socarnes). * gills strongly pleated or lobulate marginally. * = different from Socarnes.

Sexual dimorphism. Male antenna 2 peduncular articles 4-5 thick and short, flagellum elongate.

Variables. Head abnormal, ventrally truncate (S. dissimulantia), article 2 of mandibular palp not elongate (S. dissimulantia).

Relationship. 'Differing from Socarnes (See 'Additional characters').

See Waldeckia.


Habitat and distribution. Marine, East Atlantic, Mediterranean, Red Sea to South China Sea, 20-1544 m, 4 species.

Soprosyne Stebbing

Fig.92L


Paropisa Stebbing, 1899a: 206 (Opisa hispana Chevreux 1887c, monotypy).
Type species. *Sophrosyne murrayi* Stebbing, 1888, monotypy.

**Diagnosis.** Mouthparts forming quadrate bundle, some styliform. Labrum and epistome differentially produced, epistome dominant in size and projection, blunt. Incisor ordinary or very minutely toothed; molar absent; palp attached distally. Inner plate of maxilla 1 weakly (1-2) setose; palp 2-articulate, large. Inner very poorly and outer plates of maxillipeds poorly developed, palp strongly exceeding outer plate, dactyl well developed. Coxa 1 large and visible, but tapering. Gnathopod 1 enlarged, strongly chelate, article 5 shorter than 6, lobate, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus grossly chelate or barely subchelate, article 7 large to small. Inner ramus of uropod 2 without notch. Uropod 3 aequiramous, ordinary, peduncle ordinary, outer ramus 1 or 2-articulate. Telson ordinary, deeply cleft.

**Additional characters.** Head small, thus lateral surface about same as lateral surface of peduncle on antenna 1; outer plate of maxilla 1 with 2 main spines, others vestigial; inner plate of maxilla 2 short and thin, outer longer and broad; inner plate of maxilliped small, outer smaller than normal of family, largely bearing only setae, palp very large, dactyl elongate; article 2 of pereopod 7 large and shield-like (versus *Kyska*, etc.).

**Sexual dimorphism.** Male of *S. robertsoni* with calylophore on primary flagellum on antenna 1, basal article of accessory flagellum elongate; mandibular palp more setose.

**Variables.** Article 1 of antenna 1 cristate (*S. hispana*), slightly cristate (*S. robertsoni*), not cristate (*S. murrayi*); incisor with 2 small middle teeth (*S. hispana*); dactyl of gnathopod 1 fitting palm, gape absent (*S. robertsoni*), gape present (type, etc.); propodus of gnathopod 2 broad, palm large, concave, gaping, dactyl large (type); propodus thin, palm obsolescent, dactyl small (*S. hispana*); intermediate, *S. robertsoni*; outer ramus of uropod 3 2-articulate (? *S. hispana*), 2-articulate with article 2 elongate (*S. robertsoni* of California only).

**Relationship.** Characterised by the small plates of the maxillipeds, poorly spinose outer plate of maxilla 1, chelate gnathopod 1 with coxa 1 unreduced, telson cleft, and molar absent.

Differing from following genera in unreduced coxa 1: *Aristiopus*, *Cheirimedon*, *Eunyon*, *Hirondellea*, *Opisa*, *Schisturella*. From following genera in well-cleft elson *Figorella*, *Koroga*, *Pachychelium*, *Pachynus*, *pachynula*. The following genera have reduced maxilliped palp or indentured article 2 of pereopod 5: *Normanian*, *Odobron*, *Podopriovella*, *Podopriovides*.

Differing from *Valetta* in the weak plates of the maxillipeds, poorly spinose outer plate of maxilla 1, much larger gnathopod 1, and lack of molar. From *Gainella* in the long equal rami of uropod 3, broad palp of maxilliped, poor spination on the outer plate of maxilla 1 and the subequal rami of uropod 3. From *Prachynella* and *Figorella* in the well-developed palp of maxilla 1, cleft telson, small head, equal rami of uropod 3, small outer plate of the maxilliped and the long palp. From *Pachynus* in the cleft telson and broad palp of the maxillipeds. From *Koroga* in the small head, small plates of the maxilliped, cleft telson, and distal position of the mandibular palp. From *Kyska* in the small head, small outer plate of the maxilliped, poorly spinose outer plate of maxilla 1, larger palm of the chela on gnathopod 1 and the shield-like article 2 of pereopod 7.

**Species.** *Sophrosyne hispana* (Chevreux, 1887c, 1900a) (Ruffo, 1975b) (Ledoyer, 1977) [330 + B]; *S. murrayi* Stebbing, 1888, 1906 [851]; *S. robertsoni* Stebbing & Robertson, 1891 (J.L. Barnard, 1966a) (Lincoln, 1979a) [239 + 310B].

**Habitat and distribution.** Marine, probably cosmopolitan (but so far in warm east Atlantic, Kerguelen, and Californian bathos), 25-1298 m, 3 species.

**Stephensenia** Schellenberg


**Type species.** *Stephensenia haematopus* Schellenberg, 1928a, monotypy.

**Diagnosis.** Mouthparts forming quadrate bundle. Labrum and epistome [?continuous, not prominent, coalesced, blunt]. Incisor ordinary, molar triturative, large; palp absent. Inner plate of maxilla 1 weakly (3), setose; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl well developed. Coxa 1 large and visible, not tapering. Gnathopod 1 slightly elongate, nearly simple, palm transverse, article 5 much longer than 6, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus subchelate. Inner ramus of uropod 2 without notch. Uropod 3 aequiramous, ordinary, peduncle ordinary, outer ramus 1-articulate. Telson elongate, deeply cleft.

**Additional characters.** Calylophore absent on flagella of antenna 1; peduncle of antenna 2 with long fossorial spination; inner plate of maxilliped strongly spinose; anterior coxae heavily setose; pereopods 3-7 of fossorial form, heavily setose and spinose, thus articles 4-5 of pereopods 5-6 expanded, article 4 of pereopod 4 expanded, articles 5-6 of pereopod 3 elongate, of pereopod 4 much shorter, pereopod 7 elongate; rami of uropod 3 lanceolate, setose.
Sexual dimorphism. Calceoli present in male.

Relationship. Characterised by fossorial per cepods, thus strongly setose and spinose, some articles expanded, per cepod 7 elongate, uropod 3 with long lanceolate, setose rami; head small, anterior coxae very long, setose; mandibular palp absent.

Differing from Hippomedon in loss of mandibular palp. From Waldeckia in small head, fossorial per cepods, lack of mandibular palp. From Orchomene in small head, setose coxae, lack of mandibular palp, and no callynophore on flagella on antenna 1, and long setose rami of uropod 3. From Socarnes group in the poorly developed per cepods, very small or absent. Inner plate of maxilla 1 weakly (0-1) setose; palp 1 or 2-articulate, large and 2-articulate (type), with rami (S. hurleyi); coxa 1 triangular (S. capense); article 5 of gnathopod 1 longer than 6 (S. insigne); uropod 3 lacking rami (type), with rami (S. pungapunga, etc.); telson with large spines (S. pepini, S. pungapunga), without large spines (S. acutbasalis, S. insigne).

Relationship. Differing from Acontiostoma in the visible head, styliform inner plate of maxilliped and shape of gnathopod 2 palmar which is not bowl-shaped (chelate) but ordinarily chelate. From Scolopostoma in the shape of inner plate of the maxilliped and maxilla 2. From Conicostoma by the vestigial uropod 3 and hemiacetabulate telson.

Habitat and distribution. Marine, Magellanic and South America north to Valdes Peninsula, Argentina, sand beaches, burrower, 1 species.

Stomacontion Stebbing

Fig. 89S, 95K


Type species. Acontiostoma pepini Stebbing, 1888, original designation.

Diagnosis. Of conicostomin form. Mouthparts forming conical bundle, some styliform. Labrum and epistome [continuous, not differentially produced, prominent, coalesced, blunt]. Incisor ordinary, molar simple, small, conicalaminate or subconical, setulose; palp attached strongly proximal to molar. Inner plate of maxilla 1 weakly (0-1) setose; palp 1 or 2-articulate, large or small or absent. Inner poorly and outer plate of maxilliped well developed, palp scarcely exceeding outer plate, dactyl visible or absent. Coxa 1 large and visible, not tapering. Gnathopod 1 short, simple, article 5 shorter than 6, dactyl large; article 6 of gnathopod 2 slightly shorter than article 5, ordinary, propodus minutely chelate. Inner rami of uropod 2 without notch. Uropod 3 short, peduncle short, with 1 small ramus or none. Telson hemiacetabulate, incised.

Additional characters. Head visible; accessory flagellum 2-articulate; flagella of antennae 1-2 with few articles and very short; rakers present; inner plate of maxilliped narrow, styliform (versus Acontiostoma), outer plate tapering distally, palp thin; article 4 of per cepods 3-7 strongly expanded posteriorly; article 5 of per cepods 3-7 very short.

Sexual dimorphism. At least 1 species a protandrous hermaphrodite but genus also with secondary males in 2 species; male article 1 of primary flagellum with callynophore; incisor reduced and sharp or tapered; outer plate of maxilla 1 with spines reduced in size; outer plate of maxilliped smoothier, tapering even; telson deeply incised. Oostegites in reproductive female absent (S. pepini).

Variables. Palp of maxilla 1 small and 1-articulate (S. acutbasalis), small and 2-articulate (type), and 2-articulate (S. hurleyi, S. pungapunga), tiny 2-articulate (type), absent (S. capense); outer plate of maxilla 1 with only 2-3 thick spines (S. acutbasalis); plates of maxilla 2 reduced and poorly setose (S. insigne); palp of maxilliped with vestigial dactyl (type, etc.), absent (S. hurleyi); coxa 1 triangular (S. capense); article 5 of gnathopod 1 longer than 6 (S. insigne); uropod 3 lacking rami (type), with rami (S. pungapunga, etc.); telson with large spines (S. pepini, S. pungapunga), without large spines (S. acutbasalis, S. insigne).

Habitat and distribution. Marine, mostly austral, weakly antarctic, 0-177 m, often in sponges and ascidians, 6 species.

Thoriella Stephensen

Fig. 94H


Type species. Thoriella islandica Stephensen, 1915, original designation.

Diagnosis. Of cyphocarin form, head deformed; coxae 1-4 all small but because coxae 3-4 small, small mass of coxae 1-2 de-emphasised. Antennae of medium...
length, subequal, peduncles short, their articles almost as short as thick bead-like flagellar articles, flagellum of antenna 2 thick; accessory flagellum absent. Mouthparts forming quadrate bundle. Labrum and epistome differentially produced, prominent, separate, epistome strongly dominant in size and projection, blunt. Incisor ordinary, small; molar obsolete; smooth; palp absent. Inner plate of maxilla 1 strongly (5) setose; setae medial and thick; palp 2-articulate, large. Inner and outer plates of maxilliped poorly developed, palp strongly exceeding outer plate. 2-articulate, article 2 mostly fused to article 1. Gnathopod 1 short, simple, articles 5 and 6 subequal, short, dactyl large (relatively); article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus simple, article 7 tiny. Inner ramus of uropod 2 without notch. Uropod 3 vestigial. Telson absent.

**Additional characters.** Setae on inner plates of maxillae 1-2 medial, very thick; outer plate of maxilla 1 with 5 spines; setae on outer plate of maxilla 2 very small. Inner and outer plates of maxilliped subequal, subconical, palp composed of large helmet with lateral incision, apex of proximal lobe marked off by incision with weak articulate apical nipple on one side only. Coxa mostly disconjugant. Article 2 of gnathopod 1 swollen, remainder of gnathopod very short, articles 4 and 5 with setal brushes posteriorly. Pereopods 3-7 weakly prehensile; article 2 of pereopods 5-7 thin. Uropods composed of 2 segments, third fused to second and with 2 small peduncle of uropod 3, rami fused to peduncles. Telson absent.

**Variable.** Inner rami of uropods 1-2 shorter than outer (Shoemaker, 1945a).

**Relationship.** Differing from *Chevreuxiella* in the small disconjugant coxae, long inner rami of uropods 1-2, thick medial setae on inner plates of maxillae 1-2, and presence of urosomite 3 (albeit minus telson and most of uropod 3).

**Remarks.** K.H. Barnard's Gulf of Oman specimen is young and may not be this species.

**Notes on distribution.** The '2800 m' record is 'wire out' with depth of capture unstated (K.H. Barnard, 1937).

**Species.** *Tmetonyx caecula* Sars, 1895 (new name).  
*Hoplonyx* Sars, 1885: 91 [homonym, Coleoptera] (*Oniscus cicada* O. Fabricius, 1780, original designation).
**Trischizostoma** Boeck

Figs 87D, 89O, 90B, 91H, 92H, 93C, 95U


*Trischizostoma* Boeck, 1861: 637.-Stebbing, 1905b: 12, 717.


**Type species.** *Trischizostoma raschi* Boeck, 1861, original designation.


**Habitat and distribution.** Marine, probably cosmopolitan, but not recorded in Pacific Ocean, mostly pelagic or bathypelagic, 22-3655 m, 'often predatory on fishes' (?possibly moribund), 8 species.

*Tryphosella* Bonnier

Figs 89A, 90G, 92R, 94C

*Tryphosella* Bonnier, 1893: 170.-Thurston, 1974b: 16.-Lincoln, 1979a: 82. not *Tryphosa* Boeck, 1871b: 117 (= *Orchomene*).

*Tryphosa*-Gurjanova, 1951: 248 (key).

*Leptoperecrospis* Stephensen, 1925a: 119 (*Leptoperecrospis biloba* Stephensen, 1925a, monotypy).

**Type species.** *Tryphosella sarsi* Bonnier, 1896, selected by J.L. Barnard, 1969c.

**Variables.** Rostrum weak (*T. remipes, T. paucispinosum*); palp of maxilla 1 1-articulate (*T. denticulatum*); inner plate of maxilla 2 much shorter than outer (type), both plates extending equally (other species); plates of maxilliped broader and less styliform (*T. denticulatum*); coxae very short (type); shape of coxae 1-4 and article 6 of gnathopod 1 variable; dactyl of gnathopod 1 with inner denticles (*T. serratum*); article 4 of pereopods 3-4 expanded or not; pereopods 5-7 prehensile (*T. remipes*); telson cleft (*T. remipes, T. paucidespinosum, T. circulare, young T. raschi*).

**Relationship.** Differing from *Normanion* in the styliform mouthparts arranged in a conical bundle, especially the maxilliped, lower lip and mandible, in the reversed propodus and dactyl of gnathopod 1, the large rostrum and the short peduncle of uropod 3. From *Opisa* in the non-excavate palm of gnathopod 1, the more styliform outer plate of the maxilliped, the diverse coxae 2-3, and the short telson which is either entire or not deeply cleft. From *Eunonyx* in the immense gnathopod 1 and diverse coxae 2-3. From *Podopriion and Podopriionella* in the diverse coxae 2-3, small outer plate of the maxilliped, non-indurated article 2 of pereopods 5-7 and the immense gnathopod 1.
subchelate, palm oblique, or transverse, articles 5 and 6 subequal or 5 longer than 6, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely subchelate. Inner ramus of uropod 2 without notch. Uropod 3 ordinary, peduncle ordinary, inner ramus slightly shortened, outer ramus 2-articulate. Telson ordinary (type) or elongate, deeply cleft.

Sexual dimorphism. Male eyes slightly enlarged; antennae 1-2 more armed; antenna 2 with elongae and calcareous flagellum; urosomal ornaments if present more accentuated; uropod 3 larger and more setose.

Variables. Head intermediate in size between Uristes and Tryphosa forms (T. laevis); lateral lobe of head sharp (T. angulata, etc.), rounded (type of Tryphozella, etc.); epistome with sharp point (T. coxalis, T. oxystoma, Tryphosa serrata); coxa 1 scarcely reduced; (T. paramoi, Tmetonyx serrata); article 5 of gnathopod 1 much longer than article 6 (Lepidepecreopsis biloba), only slightly longer (T. caecoiodes); palm of gnathopod 1 weak (T. index), scarcely subchelate (T. index), scarcely subchelate, palm oblique, or transverse, articles 5 and 6 subequal or 5 longer than 6, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely subchelate. Inner ramus of uropod 2 without notch. Uropod 3 ordinary, peduncle ordinary, inner ramus slightly shortened, outer ramus 2-articulate. Telson ordinary (type) or elongate, deeply cleft.

Relationship. Not distinct from Uristes; these genera require pooling and revision.

Removals. Tryphozella acuta, Sars, 1895, to Tmetonyx; T. albida, Sars, 1895, to Tmetonyx; T. buani Dahl, 1959, to Bruniasotus; T. buani, Reid, 1951, to Hippomedon; T. caeculus, Sars, 1895, to Caeconyx; T. carinata, Schellenberg, 1926a, to Parschisturella; T. cicadoides, Stebbing, 1888, to Cicadossa; T. exiguus, Chevreux, 1901c, to Tmetonyx nardonis; T. leucophaeata, Sars, 1895, to Tmetonyx; T. major, K.H. Barnard, 1932, to Hippomedon; T. nardonis, Heller, 1867, to Tmetonyx; T. similis, Sars, 1895, to Tmetonyx.

Species. See Enequist (1950); Gurjanova, (1951); Schellenberg (1925a); Shoemaker (1930b); Stephens (1923a, 1925a, 1935a, 1944a); T. abyssalis, (Stephens, 1925a) (Gurjanova, 1951) (Bryazgin, 1974a) [240A + ?286]; T. analoga, (K.H. Barnard, 1932) (Andres, 1983) [833]; T. angulata, (Sars, 1895) (Stephens, 1935a) (Gurjanova, 1951) [240]; T. barentsi (Gurjanova, 1929b, 1929a, 1951, as Tmetonyx) (Stephens, 1935a) [220A]; T. biloba (Stephens, 1925a, as Lepidepecreopsis) (J.L. Barnard, 1962d) [426BA]; T. bispinosa, (Schellenberg, 1931) (Ruffo, 1949) (Bellan-Santini, 1972b) (Andres, 1983) [880 + B]; T. caecoides, (J.L. Barnard, 1962d) [701B]; T. camellus, (Stebbing, 1910a) [revived] [781]; T. castellata, K.H. Barnard, 1932 [864]; T. cicadopsis, (Schellenberg, 1926a, as Tmetonyx) [881]; T. compressa, (Sars, 1895) (Stephens, 1935a) (Gurjanova, 1951) [250B]; T. coxalis, (J.L. Barnard, 1962d) [702A]; T. cucullata, (Walker, 1904) (Nayar, 1967) [coxa] not reduced, antenna 1 carinate, mouthparts unknown [656]; T. eosa, (Meinert, 1893) [dubious] [236]; T. gracilipes, (Stephens, 1925a, as Tmetonyx) (Gurjanova, 1951) [209B]; T. groenlandica, (Schellenberg, 1935b) (Stephensen, 1944a) (Shoemaker, 1955a) [220]; T. horingi, (Boeck, 1871b) (Sars, 1895) (Lincoln, 1979a) [200 + B]; T. index, (J.L. Barnard, 1966a) [310B]; T. insignioides, (Stephensen, 1925a) (Gurjanova, 1951) [209B]; T. insignis, (Bonnier, 1896) (Chevreux, 1935) [303BA]; T. intermedia, (Schellenberg, 1926a) [881B]; T. laevis, (Bonneir, 1896, as Orchomenella) (Stephensen, 1925a) [216B]; T. longicella, (Stephensen, 1925a) [209B]; T. longidactyla, Ruffo, 1958b (348); T. longistomum, (K.H. Barnard, 1932) (Ruffo, 1949) (Andres, 1983) [890B]; T. macropropedia, (Schellenberg, 1926a) (Dahl, 1954) [870B]; T. marri, (Thurston, 1974a) [870]; T. metacella, J.L. Barnard, 1957a [309B]; T. miersi, (Stebbing, 1888, as Tmetonyx) [783]; T. minima, (Chevreux, 1911a) (Chevreux & Fage, 1925) (Ledyer, 1968) (Ruffo, 1985b) [352]; T. mucronata, (Pirlot, 1936b, as Tmetonyx) [597]; T. murrayi, (Walker, 1903, 1967) (Hurley, 1965a) (Bellan-Santini, 1972a,b) [876 + B]; T. nanoides, (Liljeborg, 1880) (Sars, 1895) (Lincoln, 1979a) [200 + B]; T. oriana, J.L. Barnard, 1978) [787]; T. orchosmenoides, (Stephensen, 1925a, as Tmetonyx) (Dunbar, 1954) [220 + BA]; T. oxystoma, (Stephensen, 1925a) (Gurjanova, 1951) [253]; T. palpiserrata, (Bellan-Santini, 1984) (Ruffo, 1985b) [302A]; T. propinqua, (Chevreux, 1926a, 1935) (Gurjanova, 1951) [216]; T. pusilla, (Sars, 1879) [885] (Gurjanova, 1951) [208B]; T. quadrata, (J.L. Barnard, 1962) (702A); T. rotundata, (Stephensen, 1925a) (Gurjanova, 1951) [209B]; T. rorsi, (Bonnier, 1893) (= identification of T. nana, by Sars, 1895) (= T. grandinana) (Chevreux & Fage, 1925) (Stephensen, 1935a) (Lincoln, 1979a) [216]; T. schneideri, (Stephensen, 1921, 1925a, 1925a, 1944a) (Gurjanova, 1951) (Bushueva, 1977) [216]; T. serans, (Lowry & Stoddart, 1983) [840]; T. serrata, (Schellenberg, 1931, as Tryphosa) [867]; T. serrata, (Schellenberg, 1931, as Tmetonyx) (Ruffo, 1947d) [866]; T. similina, (Ruffo, 1985b) [348]; T. spitzbergensis, (Chevreux, 1926a, 1935) (Stephensen, 1944a) (Gurjanova, 1951) [220]; T. stephensi, (Chevreux, 1935) [nomen nudum]; T. trianula, (Stephensen, 1925a, 1940b) (Gurjanova, 1951) [220 + B]; T. triangularis, (K.H. Barnard, 1932) (Thurston, 1974a) [833]; T. trigonica, (Stebbing, 1888) [851]; T. triopia, (Stephensen, 1925a, 1940b) [246]; T. tripianus, (J.L. Barnard, 1962d) [416A]; T. tuberculifera, (Lagardere, 1968) [possibility = Uristes] [295].

Habitat and distribution. Marine, cosmopolitan, mostly cold water and submergent, 0-4380 m, 54 species.
Tryphosites Sars
Figs 89I, 93K, 95A


Type species. Anonyx longipes Bate & Westwood, 1863, original designation.

Diagnosis. Mouthparts forming quadrate bundle. Labrum and epistome differentially produced, prominent, separate, epistome strongly dominant in size and projection, sharp. Incisor ordinary, molar triturative, large, also setulose; palp attached slightly proximal to molar. Inner plate of maxilla 1 weakly (2) setose; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp slightly exceeding outer plate, dactyl well developed. Coxa 1 large and visible, not tapering. Gnathopod 1 short, strongly subchelate, palm oblique, article 6 shorter than 5, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus subchelate. Inner ramus of uropod 2 with large notch. Uropod 3 ordinary, peduncle ordinary, inner ramus slightly shortened, outer ramus 2-articulate. Telson elongate, deeply cleft.

Additional characters. Pereopod 5 much shorter than pereopods 6-7.

Sexual dimorphism. Male eyes enlarged; flagellum of antenna 1 elongate; antenna 2 elongate and with calceoli, peduncle with anterior setae, peduncular articles 4-5 thickened; uropod 3 setose in both sexes.

Variables. Article 2 of pereopod 7 strongly serrate (T. chevreuxii); epimeron 3 with large posteroventral tooth (type), evenly serrate, no large projection (T. chevreuxii); apex on each lobe of telson with 1-3 spines medial armaments (teeth and spines) large (versus Paronesimus); articles 5-6 of gnathopods 1-2 thick; uropod 3 aquiramous, ordinary, peduncle ordinary, article 2 of outer ramus vestigial. Telson elongate, deeply cleft.


Species. See Stephensen (1925a); Chevreux (1935); Enequist, 1950 (habits); T. alleni Sexton, 1911b,c (Chevreux, 1927) (Bellan-Santini, 1984) [352B]; T. chevreuxii Stebbing, 1914b (Schellenberg, 1931) [866]; T. longipes (Bate, 1862) (Bate & Westwood, 1863) (Sars, 1895) (Chevreux & Fage, 1925) (Schellenberg, 1942) (Gurjanova, 1951) (Lincoln, 1979a) [352 + B].

Habitat and distribution. Marine, mostly cold water, Atlantic Arctic to Mediterranean and Magellan-Falkland province, 0-1210 m, 3 species.

Tryphosoides Schellenberg

Type species. Tryphosoides falcata Schellenberg, 1931, monotypy.

Diagnosis. Mouthparts forming quadrate bundle. Epistome not produced. Incisor ordinary, molar triturative, small; palp attached opposite molar. Inner plate of maxilla 1 weakly (2) setose; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp ['strongly exceeding outer plate, dactyl well developed]. Coxa 1 large and visible, slightly tapering. Gnathopod 1 short, poorly subchelate, palm oblique, article 5 shorter than 6, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely chelate. Inner ramus of uropod 2 without notch. Uropod 3 acquiramous, ordinary, peduncle ordinary, article 2 of outer ramus vestigial. Telson elongate, deeply cleft.

Additional characters. Accessory flagellum 2-articulate; article 3 of mandibular palp slender (versus Tryphosella), ratio of articles 1-3 = 25-140-115 (versus 30-140-76 in Tryphosella); outer plate of maxilliped with medial armaments (teeth and spines) large (versus Paronesimus); articles 5-6 of gnathopods 1-2 thick; urosomite 1 with deep narrow notch.

Relationship. Differing from Tryphosella and Uristes in unproduced epistome; 2-articulate accessory flagellum; less tapering coxa 1; 'slender article 3 of mandibular palp'; 'broad [and setose] rami of uropod 3'; vestigial article 2 of uropod 3 outer ramus; thick gnathopods; and better triturative molar. From Orchomene in distal position of mandibular palp. From Paronesimus in large teeth and spines on outer plate of maxilliped, reduced accessory flagellum, unexpanded coxa 1, and deeply cleft telson. See 'Sexual dimorphism' in Uristes.


Habitat and distribution. Marine, Magellanic, Paramo, shallow water, 1 species.
Type species. *Uristes gigas* Dana, 1849, 1852a, 1853, monotypy.

**Diagnosis.** Based on *Uristes antennipotens*. Mouthparts forming quadrate bundle. Labrum and epistome differentially produced, prominent, separate, labrum strongly dominant in projection, blunt. Incisor ordinary, molar weakly triturative, and/or setulose, large, weakly conicalaminate, palp attached opposite molar. Inner plate of maxilla 1 weakly (2) setose; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp scarcely exceeding outer plate, dactyl well developed. Cox 1 slightly to strongly shortened and partly covered by coxa 2. Gnathopod 1 short, nearly simple, or poorly subchelate, palm oblique, article 6 longer than 5, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, propodus minutely subchelate. Inner ramus of uropod 2 without notch. Uropod 3 ordinary, peduncle weakly elongate, inner ramus slightly shortened, outer ramus 2-articulate. Telson elongate, deeply cleft.

**Sexual dimorphism.** Some males with elongate flagellum of antenna 2 and calceoli on antennae 1-2, but calceoli also on female of type species; urosomite 1 with deep notch or slit, (*Tryphosodes falcatus* and also *Tryphosella paramoi*); uropod 3 more setose in males; article 2 of outer ramus on uropod 3 obsolescent (female *Tryphosodes falcatus* and also *Tryphosella paramoi*); oostegites thin.

**Variables.** Head of intermediate size between *Uristes* and *Tryphosella* (*U. entalladurus*); epistome poorly protuberant (*most Uristes*); molar weakly triturative (*U. barbatipes*); dactyl of maxilliped slightly reduced but not as much as in *Centromedon* (*U. sulcus*); coxa 1 scarcely tapering or reduced (*U. velia, U. entalladurus*); carpus of gnathopod 1 medium (*U. barbatipes*), very short (*U. albinus, U. serratus*), slightly reduced but not as much as in *Centromedon* (*U. sulcus*)

**Remarks.** *Uristes* and *Tryphosella* have been distinguished previously by various workers on the basis of (1) small head in *Uristes*, large in *Tryphosella* (*Tryphosa auct.*); (2) short carpus of gnathopod 1 in *Uristes*, longer in *Tryphosella*; and (3) small and ordinary prebuccal region in *Uristes*, large and protuberant epistome in *Tryphosella*. We have also tried sharp ocular lobe for *Uristes* and blunt or rounded for *Tryphosella* but this also clearly does not work as there are 'sister' or 'cousin' species that have blunt and sharp heads (such as *T. angulata* and *T. horingi*). Until better characters can be found, the clusters of species in these genera should be pooled to await a new analysis.
large. Inner ramus of uropod 2 with large notch. Uropod 3 ordinary, peduncle ordinary, inner ramus slightly shortened, outer ramus 2-articulate. Telson ordinary, deeply cleft.

**Additional characters.** Outer plate of maxillipeds with sharp apicominal cusp; coxae 1-4 short, thus coxae 1-2 similar in shape and shorter than normal for family, coxa 2 subrounded.

**Relationship.** Differing from *Valettiopsis* and *Valettietta* in the equally short and subrounded coxae 1-2 and the poorly setose inner plates of maxillae 1-2. Gnathopod 1 of *Valettia* has a weakly chelate palm unlike the other 2 genera.

**Species.** *Valettia coheres* Stebbing, 1888, 1906 [807A].

**Habitat and distribution.** Marine, antarctic abyss north of Shackleton ice shelf (Davis Sea area), 3612 m, 1 species.

**Valettietta** Lincoln & Thurston

*Valettietta* Lincoln & Thurston, 1983: 89.

**Type species.** *Valettietta lobata* Lincoln & Thurston, 1983, original designation.

**Diagnosis.** Mouthparts forming quadrate bundle. Labrum and epistome separate but neither dominant in size nor projection, blunt. Incisor widely toothed; molar triturative, small; palp attached slightly distal to molar. Inner plate of maxilla 1 strongly setose medially; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl well developed. Coxa 1 slightly shortened and partly covered by coxa 2, tapering. Gnathopod 1 elongate, strongly subchelate, palm almost transverse, articles 5 and 6 subequal, dactyl small; article 6 of gnathopod 2 almost equal to article 5, both very elongate and linear, propod subchelate. Inner ramus of uropod 2 without notch. Uropod 3 aequiramous, ordinary, peduncle ordinary, inner ramus not shortened, outer ramus 2-articulate. Telson elongate, deeply cleft.

**Additional characters.** Inner plate of maxilla 2 with strong facial row of setae.

**Variables.** Article 3 of gnathopod 1 slightly elongate (*V. gracilis*); gnathopod 2 simple (*V. gracilis*).

**Relationship.** Like *Valettiopsis* but latter with coxa 1 much more reduced and urosome bearing sharp tooth.

**Species.** *Valettietta anacantha* (Birstein & Vinogradov, 1963) [601B]; *V. gracilis* Lincoln & Thurston, 1983 [350A]; *V. lobata* Lincoln & Thurston, 1983 [350A]; *V. punctata* Bellan-Santini, 1984 [301B].

**Habitat and distribution.** Marine, Atlantic and Pacific Oceans, abyssal, 3970-4300 m (Pacific depth open trawl 0-5300 m), coming to bait, 4 species.

**Valettiopsis** Holmes

Figs 90R, 92F

*Valettiopsis* Holmes, 1908: 494.

**Type species.** *Valettiopsis dentata* Holmes, 1908, original designation.

**Diagnosis.** Mouthparts forming quadrate bundle. Labrum and epistome separate, labrum slightly dominant in size, blunt. Incisor widely toothed; molar triturative, small; palp attached slightly distal to molar. Inner plate of maxilla 1 strongly setose medially; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl well developed. Coxa 1 strongly shortened and partly covered by coxa 2, tapering. Gnathopod 1 elongate, strongly subchelate, palm almost transverse, articles 5 and 6 subequal, dactyl small; article 6 of gnathopod 2 almost equal to article 5, both very elongate and linear, propod subchelate. Inner ramus of uropod 2 without notch. Uropod 3 aequiramous, ordinary, peduncle ordinary, inner ramus not shortened, outer ramus 2-articulate. Telson elongate, deeply cleft.

**Additional characters.** Article 3 of gnathopod 1 slightly to greatly elongate; posteroventral lobe on coxa 4 weak; pereopods 5-7 elongate; pleonite 4 carinate (versus *Paralicella*).

**Variables.** Pleon and pereon carinate (*V. multidentata*); propodus of gnathopod 2 expanded (*V. macrodactyla*).

**Relationship.** Differing from *Valettia* in coxa 1 being shorter than coxa 2, the elongate rectangular coxa 2, and the fully setose inner plates of maxillae 1-2; in *Valettia* coxae 1-2 are both short together and the inner plates of the maxillae are setose mostly terminally. From *Paralicella* in the more elongate gnathopod 1, serrate incisor, smaller coxa 1 tapering distally, poorly developed posteroventral lobe on coxa 4, and carinate pleonite 4. From *Eurythenes* in the more elongate coxa 1, serrate incisor, poorly developed lobe on coxa 4, facial row of setae on the inner plate of maxilla 2, and the unswollen article 1 of antenna 2. From *Tryphosella*, *Ambasia*, *Tmetonyx*, and relatives in the densely setose maxillae 1-2. From *Aristias* in the elongate, strongly subchelate gnathopod 1 with elongate article 3 and the better developed inner plates of the maxillipeds. From
**Onesinoïdes** in the reduced and tapering coxa 1, medially setose maxillae 1-2, elongate gnathopod 1 with elongate article 3, and the large inner rami of uropod 3. From *Aristioptis* in the elongate gnathopod 1 with elongate, unlobed carpus and the multisetose maxillae 1-2.

See *Valettietta*.

**Removal.** *Valettiotus anacanthus* Birstein & Vinogradov, 1963, to *Valettietta*.

**Species.** *Valettiotus dentata* Holmes, 1908 (Gurjanova, 1962) (J.L. Barnard, 1967a) [310B]; *V. macrodactyla* Chevreux, 1909, 1935 (Lincoln & Thurston, 1983) [240BA]; *V. multidentata* J.L. Barnard, 1961a [715B].

**Habitat and distribution.** Marine, demersal cosmopolitan, 183-4300 m, coming to baited traps, 3 species.

*Ventiella* Barnard & Ingram


**Type species.** *Ventiella sulfuris* Barnard & Ingram, 1990, original designation.

**Diagnosis.** Mouthparts forming quadrate bundle. Labrum and epistome differentially produced, prominent, separate, labrum strongly dominant in size and projection, blunt. Incisor ordinary, molar triturative, small; palp attached opposite molar. Inner plate of maxilla 1 weakly (2) setose; palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp strongly exceeding outer plate, dactyl well developed. Coxo 1 strongly shortened and partly covered by coxa 2, tapering. Gnathopod 1 short, poorly subchelate, palm oblique, article 5 longer than 6, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely chelate. Inner rami of uropod 2 without notch. Uropod 3 ordinary, peduncle ordinary, inner rami slightly shortened, outer rami 2-articulate. Telson ordinary, short, weakly cleft.

**Additional characters.** Antenna 1 base of primary flagellum with callynophore and thin; inner plate of maxilla 2 basalmost medial seta largest; dactyl of gnathopod 1 with inner tooth.

**Sexual dimorphism.** Male antenna 1 accessory flagellum basal article as long as callynophore of primary flagellum (shorter in female).

**Relationship.** Differing from *Ambiopsis* in the thinner gnathopod 1, presence of 11 spines on outer plate of maxilla 1 (versus 7), presence of 1 major and 2 appressed spines on apex of inner plate on maxilliped (intermediated by *A. tumicornis*), short gape-cleft of telson, major inner seta on inner plate of maxilla 2 basalmost, non-pubescent molar with strong ridges, and appressed lobes of lower lip. From *Galaithella* in the unproduced epistome. From *Schisturella* in the more compressed apex of inner plate on maxilliped, bearing lateral acclivities, uropod 2 inner rami not incised, and telson with short gape-cleft. From *Cedrosella* in article 5 of gnathopod 1 being longer than article 6, better triturative molar, weakly cleft telson and oblique palm of gnathopod 1.

**Species.** *Ventiella sulfuris* Barnard & Ingram, 1990 [540A].

**Habitat and distribution.** Marine, deep sea sulphurated hydrothermal vent communities, eastern Pacific Ocean, 2450-2676 m, 1 species.

*Vijaya* Walker


**Type species.** *Vijaya tenuipes* Walker, 1904, monotypy.

**Diagnosis.** Probable description, poorly described. Mouthparts forming quadrate bundle. Labrum and epistome continuous, blunt. Incisor widely toothed; molar simple, small, setulose; palp attached in middle of mandible. Inner plate of maxilla 1 weakly setose; palp 1-articulate, small. Inner and outer plates of maxilliped well developed, palp scarcely exceeding outer plate, dactyl vestigial. Coxo 1 slightly shortened and partly covered by coxa 2, tapering. Gnathopod 1 short, poorly subchelate, palm oblique, article 5 longer than 6, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus minutely chelate. Inner rami of uropod 2 without notch. Uropod 3 aequiramous, ordinary, peduncle ordinary, outer rami 1-articulate. Telson ordinary, cleft one third.

**Additional characters.** Article 2 of antenna 1 half as long as article 1 (versus *Bathyamaryllis*); anteroventral corner of coxa 4 sharply attenuate (versus *Amaryllis*); article 3 of gnathopod 1 elongate.

**Relationship.** Differing from *Amaryllis* in the acute anteroventral angle of coxa 4 and the much more elongate article 3 of gnathopod 1. From *Bathyamaryllis* in article 2 of antenna 1 being half the length of article 1.

**Species.** *Vijaya tenuipes* Walker, 1904 (Nayar, 1967) [665].

**Habitat and distribution.** Marine, Sri Lanka (= Ceylon), shallow water, 1 species.
Waldeckia Chevreux

_Ephippiphora_ White, 1847b: 226 [homonym, Lepidoptera] (Ephippiphora _kroyeri_ White, 1847b, monotypy).

_Charcotia_ Chevreux, 1905d: 163 [homonym, Mollusca].

_Waldeckia_ Chevreux, 1906a: 13 (new name).

**Type species.** _Charcotia obesa_ Chevreux, 1905d, original designation.

**Diagnosis.** Mouthparts forming quadrate bundle. Labrum and epistome prominent, separate, both well projecting, blunt. Incisor ordinary, molar simple, large, conicolaminate or subconical, setulose; palp attached strongly proximal to molar. Inner plate of maxilla 1 moderately to weakly (2-6) setose (spinose); palp 2-articulate, large. Inner and outer plates of maxilliped well developed, palp slightly exceeding outer plate, dactyl well developed. Coxa 1 large and visible, not tapering. Gnathopod 1 short, simple (type), or poorly subchelate, article 5 shorter than 6, dactyl large; article 6 of gnathopod 2 greatly shorter than article 5, ordinary, propodus subchelate. Inner ramus of uropod 2 without notch. Uropod 3 ordinary, peduncle ordinary, inner ramus slightly shortened, outer ramus 2-articulate. Telson elongate, deeply cleft.

**Additional characters.** Pereopod 5 same length as uropod 4 (versus _Ichnopus_); apices of telson usually with large spines; gills not pleated (versus _Socarnes_ but see ‘Variables’).

**Sexual dimorphism.** Male antenna 1 primary flagellum with callynophore, base elongate; antenna 2 flagellum elongate, articles 3-5 of peduncle widely expanded with male tufts; some females with setose uropod 3.

**Variables.** Article 3 of mandibular palp short (W. _kroyeri_ fide Hale, 1929); inner plate of maxilla 1 with setation variable (W. _obesa_, see Thurston, 1974a); plate width of maxilla 2 reversed from type (W. _chevreuxi_), thus outer plate broader; gnathopod 1 with small palm (_W. elephas_), often sharp (W. _kroyeri_, _W. australiensis_), propodus shorter than type (W. _kroyeri_, see Chilton, 1921d); palm of gnathopod 2 broadly and bluntly chelate (W. _kroyeri_), chelate palm hollow, with spine, dactyl small (W. _elephas_); urosomite 1 with large process (type, etc.), or absent (W. _kroyeri_, etc.); article 2 on outer ramus of uropod 3 obsolete (W. _enoi_).

**Identification problem.** Pleated gills present on _W. kroyeri_ fide Chilton (1921d).

**Relationship.** Differing from _Lysianassa_ in deeply cleft telson. From _Socarnes_ in non-pleated gills, very obese body, high coxal plates, much more proximal mandibular palp, and outer plate of maxilliped exceeding apex of article 2 on palp. From _Socarnopsis_ in the short carpus of gnathopod 1. From _Socarnoides_ in simple inner ramus of uropod 2. From _Socarnella_ in the 2-articulate outer ramus of uropod 3. From _Menigrates_ in large uropod 3, long and deeply cleft telson, prominent prebuccal mass, and presence of accessory lobes on branchiae. From _Ichnopus_ in similar lengths of pereopods 6-7, unpleated gills, proximal mandibular palp, no brush on gnathopod 1 dactyl, no tooth on antenna 1, and non-sickle-shaped mandibular palp article 3. From _Lepidepecreum_ in poorly carinate antenna 1, greater dominance of upper lip in prebuccal mass, and simple gnathopod 1.

**Distribution note.** To confirm identifications of _W. chevreuxi_ outside of southern Australia; to confirm identifications of _W. kroyeri_ outside of northern Australia and validate subspecies: thus question marks on certain taxa and distributions.

**Species.** _Waldeckia australiensis_ (Haswell, 1879b, 1885b) (Stebbing, 1910a) (J.L. Barnard, 1974b) [781]; _W. chevreuxi_ Stebbing, 1910a (Chilton, 1921d, 1922b) (Hale, 1927, 1929) (?Bellan-Santini & Ledoyer, 1974) [780]; _W. elephas_ Hirayama & Kikuchi, 1980b [395]; _W. kroyeri_ (White, 1847b) (Bate, 1862) (Chilton, 1921d) (Hale, 1929) [780]; _W. k. crenulata_ Pirlot, 1936b [640]; _W. k. enoi_ Stephensen, 1931c, Pirlot, 1936b [640]; _W. k. kroyeri_ (White, 1847b, Pirlot, 1936b) [640]; _W. nitens_ (Haswell, 1879a, 1882) (?= _W. affinis_ Haswell, 1879a) (?_W. chevreuxi_ identification of Stebbing, 1910a) (J.L. Barnard, 1974b) [781]; _W. obesa_ (Chevreux, 1905d, 1906a) (Walker, 1907) (Schellenberg, 1926a) (K.H. Barnard, 1930) (Nicholls, 1938) (Bellan-Santini, 1972b) (Thurston, 1974a) (Andres, 1983) [870 + B].

**Habitat and distribution.** Marine, Australia, Indonesia, Japan, New Zealand, Kerguelen, Antarctica, 0-550 m, 6 species.

_Wecomodon_ Jarrett & Bousfield


**Type species.** _Hippomedon wecomus_ J.L. Barnard, 1971b, original designation.

**Diagnosis.** Mouthparts forming quadrate bundle. Labrum and epistome differentially produced, separate, labrum slightly dominant in projection, blunt. Incisor ordinary, molar triturative, large; palp attached opposite molar. Inner plate of maxilla 1 with large spines; gills not pleated (versus _Socarnes_ but see ‘Variables’).

**Relationship.** Differing from _Lysianassa_ in deeply cleft telson. From _Socarnes_ in non-pleated gills, very obese body, high coxal plates, much more proximal mandibular palp, and outer plate of maxilliped exceeding apex of article 2 on palp. From _Socarnopsis_ in the short carpus of gnathopod 1. From _Socarnoides_ in simple inner ramus of uropod 2. From _Socarnella_ in the 2-articulate outer ramus of uropod 3. From _Menigrates_ in large uropod 3, long and deeply cleft telson, prominent prebuccal mass, and presence of accessory lobes on branchiae. From _Ichnopus_ in similar lengths of pereopods 6-7, unpleated gills, proximal mandibular palp, no brush on gnathopod 1 dactyl, no tooth on antenna 1, and non-sickle-shaped mandibular palp article 3. From _Lepidepecreum_ in poorly carinate antenna 1, greater dominance of upper lip in prebuccal mass, and simple gnathopod 1.
uropod 2 without notch. Uropod 3 ordinary, peduncle ordinary, inner ramus slightly shortened, outer ramus 2-articulate. Telson elongate, deeply cleft.

**Additional characters.** Head 'small'; article 1 of antenna 1 weakly carinate apically; article 1 of flagellum longer than articles 2 or 3 of peduncle; female antenna 2 less than twice as long as antenna 1; pereopod 5 shortened, pereopod 6 longest; gill 7 absent.

**Sexual dimorphism.** Flagella of male antennae 1-2 elongate, calceoli occasionally present on antenna 2; uropod 3 slightly more setose.

**Variables.** Inner plate of maxilla 1 with 2-5 setae; palm of gnathopod 1 indistinct (W. boreopacificus); telsonic lobes with 1-5 apical spines and 0-4 lateral spines.

**Taxonomy.** Attempts to make this genus separable from various non-Pacific species of Hippomedon will require more subdivisions of the genus.

**Relationship.** Differing from Hippomedon in not having a callynophore on the primary flagellum of antenna 1 and the lack of gill 7. From Paratryphosites in the deeper cleft of the telson, presence of gill 7 and shorter antenna 2. From Psammonyx in the longer article 1 on the primary flagellum of antenna 1, with pereopod 6 being longest of pereopods 5-7, also with pereopod 5 not being 25% shorter than pereopods 6-7. From Elimedon and Paracentronzedon in the long article 3 on the mandibular palp.

**Species.** Alibrotus chauseicus Milne Edwards, 1840 [242].

**Habitat and distribution.** Marine, Iles Chauseay.

**Stenia Dana**


**Type species.** Stenia magellanica Dana, 1852a, monotypy.

**Remarks.** Rather well described anteriorly but unidentifiable to genus because of lack of detailed information on epimeron 3, uropods 2-3 and telson. Flagella of antenna 1 long; epistome and upper lip separate, neither dominant, both weakly produced; mandible well illustrated, molar large, of conicolaminate form, palp attached opposite molar, incisor untoothed, article 3 of palp short. Maxillae and maxillipeds ordinary; lateral cephalic lobe with identifiable shape; coxa 1 ordinary; gnathopod 1 slender, articles 3,5,6 slightly elongate (but not like Pseudorchomene), carpus not lobate, hand with well-developed oblique palm; remainder of body ordinary. Like a large Anonyx. Possibly identifiable by Magellan specialist based on excellent anterior details.

**Species.** Stenia magellanica Dana, 1852a (= S. fuegiensis Dana, 1853) [864].

**Habitat and distribution.** Marine, Tierra del Fuego, Good Success Bay.

**MACROHECTOPIDAE** Sowinsky, 1915

[see Barnard & Barnard (1983)]

**MAXILLIPIDAE** Ledoyer, 1973b

**Diagnosis.** Body depressed; head weakly depressed, eyes weakly bulging. Antenna 2 longer than 1, articles 1-3 of antenna 1 short and progressively shorter; accessory flagellum absent. Mandibular incisor present, molar large, weakly triturative, rakers present, palp vestigial or absent. Maxillae ordinary, palp of maxilla 1 uniarticulate. Inner plates of maxillipeds very small or slender, poorly armed, outer plates very large, palp huge. Coxa 1 vestigial, hidden by coxa 2, other coxae very short, overlapping. Gnathopods feeble, poorly setose, scarcely subchelate, but gnathopod 1 broader and shorter than 2. Article 2 of pereopod 5 unexpanded or weakly lobate, of pereopods 6-7 expanded and lobate. Pereopod 6 enormously elongate, articles 6-7 forming
long whip. Peduncle of uropod 3 elongate, rami longer than peduncle. Telson short, apparently not fleshy, much broader than long, uncielt.

See Amphiploichidae, Colomastigidae, Dexaminiidae, Dulichidae, Melphidippidae and Pardaliscidae.

**Description.** Body weakly carinate on pleon. Head with medium rostrum, eyes bulging, bilateral, ommatidial, medium to large. Article 1 of antenna 1 short. Incisors extended, toothed, laciniae mobiles present, 2-3 rakers present; molar large, maul-shaped, weakly triturative, palp absent or represented by hump and seta. Outer lobes of lower lip appressed, inner lobes small and plastered to outer lobes, or large and fleshy, mandibular lobes sharp and broad. Inner plate of maxilla 1 small, naked, outer plate with 8-10 spines, palp long and 1-articulate. Plates of maxilla 2 slender, apically setose, inner plate occasionally with 1-2 medial setae. Inner plates of maxillipeds narrow, small, with 2-3 apical setae each, outer plates with oblique apicominal margin bearing pairs or singles of thin diverse arnmentum, palp article 2 flabellate, sparsely setose-spinose medially, article 3 curved, dactyl unguiform.

Article 2 of gnathopods 1-2 slender, article 3 short; article 4 of gnathopod 1 weakly lobate, carpus longest, broadest, lobate or not, propodus short, broadly ovate, mittenform, palm oblique or vestigial, setose, dactyl large to small, simple; article 4 of gnathopod 2 short, carpus elongate, unlobed, propodus elongate, rectangular, slightly shorter and/or much narrower than carpus, palm minute or absent, transverse, posterior margin of propodus poorly armed, straight, dactyl stout, curved, sharp.

Pereopods 3-4 slender, article 4 very short, article 2 of pereopod 5 unexpanded, of pereopods 6-7 moderately expanded, with sharp posteroventral lobe. Oostegites huge, on coxae 2-4. Epimeron 2 larger than 3. Urosomites separate, 1 largest. Rami of uropods 1-3 lanceolate, outer rami of uropods 1-2 shortened. Peduncle of uropod 3 elongate, rami (almost) as long as peduncle or longer, simple. Telson very short, broad, entire, with 2 apical setule notches.

**Sexual dimorphism.** Male unknown.

**Relationship.** Similar to Melphidippidae but coxa 1 vestigial, telson much broader than long, mandibular palp absent and palp of maxilliped very broadened.

Like Colomastigidae but urosomites separate, gnathopod 1 dominant, antennal flagella well developed, palp of maxilliped expanded (versus outer plate and its article expanded in Colomastigidae).

Differing from Dexaminiidae in the separated urosomites, vestigial coxa 1 and short uncielt telson. From Pardaliscidae in the large molar. From Stilipediidae (= Astyridae) in the large molar, lack of mandibular palp and severe reduction of coxae. From Amphiploichidae in the severe reduction of coxae and short telson. From Dulichidae in the short peduncle of antenna 1, weak, simple gnathopod 2 and large uropod 3. From Iciliidae in the elongate peduncle of uropod 3 with equal rami, reduced coxa 1 covered by coxa 2, short peduncle of antenna 1, lack of mandibular palp, uniarticulate palp of maxilla 1, and feeble plates of the maxillipeds.

### Key to Genera of Maxillipiidae

1. Gnathopod 1 carpochelate; article 1 of maxillipetal palp larger than article 2
   
   — Gnathopod 1 not carpochelate; article 1 of maxillipetal palp much smaller than article 2

   **Maxillipes** Ledoyer

   **Maxillipedia** Ledoyer, 1984: 86.

   **Type species.** *Maxillipes laticarpus* Ledoyer, 1984, original designation.

   **Diagnosis.** Gnathopod 1 not carpochelate; article 1 of maxillipetal palp much smaller than article 2.

   **Species.** *Maxillipes laticarpus* Ledoyer, 1984 [586].

   **Habitat and distribution.** Marine, New Caledonia, shallow water, seagrass, 1 species.

   **Maxillipedia** Ledoyer, 1973b: 32.

   **Type species.** *Maxillipedia rectitelson* Ledoyer, 1973b monotypy, probably unavailable by ICZN rules (monotypy not longer acceptable), but here so designated.

   **Diagnosis.** Gnathopod 1 carpochelate; article 1 of maxillipetal palp with larger surface area than article 2.

   **Species.** *Maxillipedia commensalis* Lowry, 1984a [597]
M. rectitelson Ledoyer, 1973b, 1986 [698N].

**Habitat and distribution.** Marine, Madagascar, seagrass bed (*Enhalus acoroides*), shallow water, to New Guinea, on gorgonian, *Melithaea* species, 2 species.

**MEGALUROPIDAE** Thomas & Barnard, 1986b
[see Barnard & Barnard (1983)]

**MELITIDAE** Bousfield, 1973
[see Barnard & Barnard (1983)]

**MELIPHDIPPIDAE** Stebbing, 1899a
[see Barnard & Barnard (1983)]

**MESOGAMMARIDAE** Bousfield, 1977
[see Barnard & Barnard (1983)]

**NAJNIDAE** J.L. Barnard, 1972b

**Diagnosis.** Talitroidea with laterally compressed body, smooth cuticle, no bulges. Head compressed but with slight anterodorsal flattening and shift of antennae ventrally; antennae non spines. Coxae 1-2 subpyriform. Mandibular molar replaced by 1-2 spines. Setae of brood lamellae normally curl tipped. Urosomites free. Uropod 3 with vestigial ramus.

See *Hyalellidae* and *Hyalidae*.

**Description.** Upper lip slightly lobate; palp of maxilla 1 present; article 4 of maxillipedsal palp small, not unguiform. Telson short, broad, entire.

**Relationship.** Characterised by the reduction in molar combined with reduction in ramus of uropod 3; the head shape is distinctive.

*Na* *jna* Derzhavin

Figs 701, 71A

*Naja* Derzhavin, 1937: 97, 111.

**Type species.** *Naja consiliorum* Derzhavin, 1937, original designation.

**Diagnosis.** With characters of the family.

Fig.96. Maxillipidae. *Maxillipus rectitelson.*

Habitat and distribution. Marine, boreal north-western and north-eastern Pacific, 0-45 m, 2 species.

NEONIPHARGIDAE Bousfield, 1977
[see Barnard & Barnard (1983)]

NIHOTUNGIDAE J.L. Barnard, 1972a

Diagnosis. Body compressed, with appearance of stenothoid or cypridinid. Head more or less ordinary but with 4 eyes, 1 main pair and 1 pair of accessory eyes, both composed of ommatidia. Accessory flagellum obsolescent. Mouthparts styliform, especially mandible and maxilla 1; molar absent, mandibular palp present; outer plates of maxilliped large (versus Stenothoidae). Coxa 4 huge, as wide as length of 4 pereonites, covering parts of anterior coxae, coxa 1 also large but coxae 2-3 equally small or progressively smaller. Gnathopods feeble, simple. Urosomites separate. Uropod 3 uniramous, ramus biarticulate. Telson of ordinary length, entire, weakly fleshy but generally laminar.

See Stenothoidae, Amphilocheidae and Pagetinidae.

Description. Head short, ocular lobes very broad dorsoventrally, main eye irregular, largely composed of dense pigment with white and red anterior ommatidia (in preservative), accessory eye small, below main eye, trabecular, with several free apical ommatidia. Antennae very short and poorly articulate. Labrum [of varying interpretation, requiring further study]. Mandibles styliform, incisor and lacinia mobilis greatly elongate; molar absent; articles 1 and 3 of palp elongate, article 2 short, setae vestigial. Labium [unknown] but possibly misinterpreted as part of maxilla 1; complex of maxilla 1 and labium with 2 lobes bearing large setae, 1 partially divided lobe with 2 rows of setules, 1 plain and 1 flagellate blade. Maxilla 2 distinct, moderately to feebly setose, lobes thin. Inner lobes of maxilliped thin, small, bearing 1-2 apical spine-setae, outer plates very large, palp of medium size, 3-articulate. Articles 5-6 of gnathopod 1 slightly elongate, article 5 broadly lobate, article 6 simple; gnathopod 2 much more elongate and like pereopods 3-4, article 5 not lobate. Article 2 of pereopods 3-6 slender, of pereopod 7 slightly expanded. Uropods 1-2 ordinary. Uropod 3 small, articles 2 and 3 short.

Relationship. This strange little group of amphipods is distinguished by the combination of uniramous uropod 3 (= stenothoid), enlarged outer plates of the maxillipeds, large coxa 4 (again stenothoid) associated with large coxa 1 but small coxae 2-3, blade-like appendage of maxilla 1 and accessory eye. The styliform (?piercing) mandible is also peculiar. The uniramous uropod 3 distinguishes Nihotungidae from Amphilocheidae; the large outer plates of the maxillipeds and styliform mandible distinguish Nihotungidae from Stenothoidae and Pagetinidae. The blade-like appendage of maxilla 1 is unique in Gammaridea but Nihotungidae

Fig.97. Nihotungidae. Nihotunga ilika.
as known at present are easily recognised by their extremely small size (1.25 mm long), slick suborbicular body and odd eyes. After death in formaldehyde washings of algal substrates they tend to float to the water surface and become trapped in the meniscus and must be conserved by use of very fine wire or cloth filters. Once transferred to alcohol they then tend to sink and are easy to handle. In formaldehyde the body colour often is bright non-oxidised fluorescein green but this is lost rapidly in alcohol and the body then has a greyish hue which on close view is composed of a brownish cast on a pale blue matrix.

The ommatidia not enveloped in pigment appear to be relatively constant and species-specific in number, position and colour, there generally being a few red ommatidia among the eight or so clear ommatidia.

Nihotunga J.L. Barnard

Fig.97


Type species. Nihotunga iluka J.L. Barnard, 1972a, original designation.

Diagnosis. With the characters of the family.

Description. Pattern of colour in ommatidia variable interspecifically. Coxae 3 and 4 variable in size or shape.

Species. N. iluka J.L. Barnard, 1972a [792]; N. noa J.L. Barnard, 1972b [775]; species, (USNM collections) [953].

Habitat and distribution. Marine, Australia, New Zealand, Guam, littoral, 3 species.

Key to Genera of Oedicerotidae

1. Molar not triturative.......................................................... 2
   — Molar triturative.......................................................... 13
2. Gnathopod 1 much larger than gnathopod 2 .................. 3
   — Gnathopod 1 not larger than gnathopod 2 ................. 4
3. Gnathopod 2 chelate ....................................................... Synchelidium
   —Gnathopod 2 subchelate ........................................... Monoculodopsis
4. Gnathopods lacking significant carpus lobes ................ 5
   —Gnathopods with carpus lobes ................................. 6

NIPHARGIDAE S. Karaman, 1943
[see Barnard & Barnard (1983)]

OCHLESIDAE Stebbing, 1910a
See Iphimediidae

OEDICEROTIDAE Liljeborg, 1865b

Diagnosis. Pereopods 5-6 equally short, pereopod 7 immensely elongate and of different shape than pereopods 5-6; pereopods weakly fossorial; head large, eyes when present dorsally appressed or fused together; telson short, entire or emarginate; apices of rami on uropods 1-2 naked or bearing immersed nails, no subapical spines.

Description. Head large, rostrum present or absent; mouthparts basic; coxae large; urosomites 2-3 rarely fused together; uropod 3 with elongate peduncle.

Relationship. Exoedicerotidae have subapical spines on the rami of uropods 1-2.
Paracalliopiidae always have urosomites 2-3 fused together but a few Oedicerotidae also have this character. Paracalliopiids also have distinctive gnathopods turning inward on death (see illustrations).

Remarks. Problems with Arris sobolevi, and Finoculodes, differences between Monoculodes and Paraperioculodes, and relationships within the Arrhis-Aceroides complex and its relationship to Bathymedon have not been resolved.

5. Article 1 of antenna 1 with tooth ........................................................................................................Cornuclila
   --- Article 1 of antenna 1 lacking tooth .........................................................................................Aborolobatea
6. Palp of mandible absent, gnathopods feeble .................................................................................Machaironyx
   --- Palp of mandible present, gnathopods robust ........................................................................7
7. Lobes on carpus of at least gnathopod 1 short or scarcely guarding propodus ......................8
   --- Lobes on carpus of gnathopods both long and guarding propodus .............................................9
8. Lobes on carpus of gnathopods subequal to each other ..........................................................Oediceros
   --- Lobe on carpus of gnathopod 1 much smaller than on gnathopod 2 ..................................Paroediceros
9. Article 3 of mandibular palp as long as article 2 .........................................................................10
   --- Article 3 of mandibular palp shorter than article 2 ..................................................................11
10. Rostrum absent, pereopods 3-4 lacking facial setal row on article 4 ............................................Arrhinopsis
    --- Rostrum present, pereopods 3-4 with facial setal row on article 4 ..............................................Finoculodes
11. Outer plate of maxilliped extending only to apex of palp article 1, dactyls of pereopods 3-4 longer than article 6 ..........................................................................................................................Sinoediceros
    --- Outer plate of maxilliped extending well beyond apex of palp article 1, dactyls of pereopods 3-4 much shorter than article 6 ..........................................................................................................................12
12. Telson not excavate, article 1 of antenna 1 lacking tooth, incisor well toothed ....................Perioculodes
    --- Telson excavate, article 1 of antenna 1 bearing tooth, incisor not toothed ..........................Perioculopsis
13. Gnathopod 2 chelate ..................................................................................................................Pontocrates
    --- Gnathopod 2 subchelate ..........................................................................................................14
14. Gnathopod 1 both feeble and palm transverse ........................................................................Carolobatea
    --- Gnathopod 1 either robust or palm oblique ...........................................................................15
15. Incisor poorly toothed ..................................................................................................................16
    --- Incisor well toothed ..................................................................................................................21
16. Gnathopod 1 much larger than gnathopod 2, (article 3 of antenna 1 as long as article 1) ........Monoculopsis
    --- Gnathopod 1 not larger than gnathopod 2, (article 3 of antenna 1 shorter than article 1) ....17
17. Coxa 3 or 4 excavate below .......................................................................................................18
    --- Coxae 3-4 not excavate below .................................................................................................19
<table>
<thead>
<tr>
<th>Article</th>
<th>Description</th>
<th>Taxon</th>
</tr>
</thead>
<tbody>
<tr>
<td>18.</td>
<td>Article 2 of antenna 1 shorter than article 1</td>
<td>Aceroides</td>
</tr>
<tr>
<td></td>
<td>— Article 2 of antenna 1 as long as article 1</td>
<td>Arrhis</td>
</tr>
<tr>
<td>19.</td>
<td>Gnathopods robust, eyes forming dorsal ring</td>
<td>Gulbarentsia</td>
</tr>
<tr>
<td></td>
<td>— Gnathopods feeble, eyes absent or not forming dorsal ring</td>
<td></td>
</tr>
<tr>
<td>20.</td>
<td>Eyes feeble or absent, article 2 of mandibular palp 'straight'</td>
<td>Bathymedon</td>
</tr>
<tr>
<td></td>
<td>— Eyes well developed, article 2 of mandibular palp 'curved'</td>
<td>Westwoodilla</td>
</tr>
<tr>
<td>21.</td>
<td>Uropod 2 reaching only to apex of peduncle on uropod 3, latter huge</td>
<td></td>
</tr>
<tr>
<td></td>
<td>— Uropod 2 well exceeding apex of peduncle on uropod 3, latter ordinary</td>
<td></td>
</tr>
<tr>
<td>22.</td>
<td>Gnathopods large, carpus short and strongly lobate</td>
<td>Halicreion</td>
</tr>
<tr>
<td></td>
<td>— Gnathopods feeble, carpus elongate, unlobate</td>
<td>Parhalimedon</td>
</tr>
<tr>
<td>23.</td>
<td>Article 4 of pereopod 5 enveloping article 5 posteriorly</td>
<td>Parexoediceros</td>
</tr>
<tr>
<td></td>
<td>— Article 4 of pereopod 5 not enveloping article 5</td>
<td></td>
</tr>
<tr>
<td>24.</td>
<td>Back multicarinate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>— Back not multicarinate</td>
<td></td>
</tr>
<tr>
<td>25.</td>
<td>Eyes large, appressed together dorsally, not confined to rostrum and not filling rostrum</td>
<td>Acanthostepheia</td>
</tr>
<tr>
<td></td>
<td>— Eyes absent or when present small and filling rostrum only, not on body of head</td>
<td>Oediceroides</td>
</tr>
<tr>
<td>26.</td>
<td>Eyes completely coalesced dorsally on head proper</td>
<td></td>
</tr>
<tr>
<td></td>
<td>— Eyes absent or with small dividing raphus or filling only rostrum</td>
<td></td>
</tr>
<tr>
<td>27.</td>
<td>Telson entire, coxa 4 with weak blunt lobe</td>
<td>Paraperioculodes</td>
</tr>
<tr>
<td></td>
<td>— Telson emarginate, coxa 4 with strong sharp lobe</td>
<td>Paroediceroides</td>
</tr>
<tr>
<td>28.</td>
<td>Article 1 of antenna 1 with small tooth, (coxa 4 with huge blunt lobe)</td>
<td>Oedicerina</td>
</tr>
<tr>
<td></td>
<td>— Article 1 of antenna 1 lacking tooth, (coxa 4 with medium to small blunt lobe or large sharp lobe)</td>
<td></td>
</tr>
<tr>
<td>29.</td>
<td>Outer plate of maxilla 2 with stout spine</td>
<td>Anoediceros</td>
</tr>
<tr>
<td></td>
<td>— Outer plate of maxilla 2 lacking spine</td>
<td></td>
</tr>
<tr>
<td>30.</td>
<td>Antenna 1 very short, scarcely or not exceeding article 5 on antenna 2, peduncle of antenna 2 enlarged and usually with long curved spines</td>
<td></td>
</tr>
<tr>
<td></td>
<td>— Antenna 1 well exceeding article 5 on antenna 2, peduncle of antenna 2 lacking long curved spines</td>
<td></td>
</tr>
</tbody>
</table>

31. Rostrum well developed ................................................................. Oediceroides
   — Rostrum feeble ........................................................................... 32

32. Articles 1-2 of antenna 1 elongate, outer plate of maxilla 2 with spine, peduncle of antenna 2 lacking long spines, coxa 4 lobe weak .................................................. Anoediceros
   — Articles 1-2 of antenna 1 short, outer plate of maxilla 2 lacking spine, peduncle of antenna 2 bearing long spines, coxa 4 lobe huge .................................................. Oediceropsis

33. Article 3 of antenna 1 shorter than article 1 ........................................ Monoculodes
   — Article 3 of antenna 1 as long as article 1 .......................................... 34

34. Carpus lobes of gnathopods guarding propodus ................................... Monoculopsis
   — Carpus lobes of gnathopods not guarding propodus ........................ Lopiceros

**Aborolobatea** Ledoyer

*Aborolobatea* Ledoyer, 1984: 90.

- **Type species.** *Aborolobatea paracheliformis* Ledoyer, 1984, original designation.

- **Diagnosis.** Cutting edge of mandible scarcely projecting and poorly toothed; molar vestigial. Inner lobes of lower lip separate but small. Gnathopods similar to one another, feeble, subchelate, carpus not lobate; palm of both gnathopods transverse. Uropod 2 [fully reaching end of rami on uropod 3]. Uropod 3 well developed.

- **Additional characters.** Article 1 of antenna 1 lacking tooth; epistome not produced; incisor very broad, flat, lacking callus; articles 2-3 of mandibular palp ordinary; palp of maxilla 1 not apically expanded; outer plate of maxilla 2 broad; inner plate of maxilliped vestigial; coxa 4 as broad as long; outer ramus of uropod 1 strongly shortened.

- **Relationship.** Differing from *Cornudilla*, which also has non-lobate carpus on the gnathopods, in the vestigial molar, ordinary coxa 4, vestigial inner plates of the maxillipeds, ordinary article 2 on the mandibular palp, and the presence of long D-setae on mandibular palp article 3.

- **Species.** *Aborolobatea paracheliformis* Ledoyer, 1984 [586].

- **Habitat and distribution.** Marine, New Caledonia, shallow water in seagrass, 1 species.

**Acanthostepheia** Boeck


- **Type species.** *Acanthostepheia malmgreni* Goes, 1866, monotypy.

- **Diagnosis.** Cutting edge of mandible projecting and toothed; molar large, ridged, cup-shaped, dentate. Inner lobes of lower lip separate. Gnathopods similar to one another, subchelate, stout, carpus with blunt strong posterior lobe partially guarding propodus, palm of both gnathopods oblique. Uropod 2 fully reaching end of rami on uropod 3. Uropod 3 well developed.

- **Additional characters.** Body dorsally multicarinate; articles 6-7 of pereopods 3-4 especially elongate.

- **Relationship.** Differing from *Oediceroides* in the well-developed eyes appressed together dorsally on non-rostral part of head; genus all arctic, *Oediceroides* mostly to the south.

- **Species.** See Gurjanova (1951); *A. behringiensi* (Lockington, 1877) (= *A. pulchra* Miers, 1881) (Stephensen, 1938b) (Shoemaker, 1955a); *A. m. alba* Dementieva, 1931; *A. b. carica* Dementieva, 1931; *A. b. polaris* Dementieva, 1931 (Bulycheva, 1957c) [220]; *A. incarinata* Gurjanova, 1929b, 1930a (Birula, 1937) (Bulycheva, 1957c) [220]; *A. malmgreni* Goes, 1866 (Stephensen, 1931a, 1938b) (Kuznetzov, 1964) (Shoemaker, 1955a) [220 + B].

- **Habitat and distribution.** Marine, circum-Arctic, 0-550 m, 3 species.
**Aceroides** Sars
Figs 98F, 99J, 100G

(Patoides) J.L. Barnard, 1964a: 33 (*Oediceroides* (Patoides) *synparis* J.L. Barnard, 1964a, original designation) [valid subgenus].

Type species, *Halicreion latipes* Sars, 1882, monotypy.

Taxonomy. See the following discussion on the relationship of this genus to *Arrhis*, *Anoediceros* and *Patoides*.

The *Arrhis–Anoediceros–Aceroides* Problem

Several species in the total 13 of this complex are poorly described, several others have crucial omissions because of missing parts when described and many differ in important characters from the type species of the genus to which they have been assigned in the literature.

Species with missing parts are: *A. callida* and *A. edax* (antenna 1); not described for *A. sobolevi* are pereopods 3-4, mandible and palp; for *A. luthkii*, head, antenna 1, mandible and palp; for *A. synparis*, mandibular palp; for *A. sedovi*, incisor, antenna 1; for *A. limicola*, facial armament of pereopods 3-4.

Character divergence from the type species is found in: well-toothed incisor of *Aceroides kobjakovae*, *A. limicola*, *A. synparis*, *A. callida*.

Elongate article 2 of antenna 1 for: *A. kobjakovae*, *A. limicola*, *A. synparis*; vestigial carpal lobes of gnathopods: *A. sobolevi*.

Minority of character: the presence or absence of a thick spine on the outer plate of maxilla 2 in *Anoediceros* is its only distinctive generic character; this is found in the type species, *Anoediceros hanseni* and a more simple version of the spine is found in *Aceroides* (*Patoides*) *synparis*.

---

Poorly developed pereopods 3-4 are found in *Anoediceros hanseni* and *Arrhis mediterraneus*, but of the 10 other species in which pereopods 3-4 are known, only 6 of those with stout pereopods 3-4 have facial setae on article 4 (*Arrhis luthkei*, and *Aceroides latipes*, *A. goesi*, *A. callida*, *A. kobjakovae* and *Patoides edax*). The latter, having a large process on article 5, connects to *Patoides synparis* which lacks facial setae on article 4.

Taxa are grouped as in the following key:

### Key 1 to Species of *Aceroides*, *Arrhis* and *Anoediceros*

1. Carpal lobes of gnathopods obsolescent ........................................... *Arrhis sobolevi*
   — Carpal lobes of gnathopods well developed ........................................... 2
2. Carpus of pereopods 3-4 with posterior lobe ........................................ 3
   — Carpus of pereopods 3-4 without posterior lobe ..................................... 7
3. Gnathopods 1-2 with large tooth on article 4 ....................................... 4
   — Gnathopods 1-2 without large tooth on article 4 .................................. 6
4. Mandibular incisor not toothed ....................................................... *Aceroides edax*
   — Mandibular incisor toothed ................................................................... 5
5. Process of article 5 of pereopods 3-4 guarding article 6 ...................... *Aceroides synparis*
   — Process of article 5 of pereopods 3-4 not guarding article 6 .................. *Aceroides limicola*
6. Gnathopod 1 palm obsolescent, lobe on article 5 not reaching dactyl hinge tangent ........................................... *Aceroides goesi*
   — Gnathopod 1 palm well developed, lobe on article 5 reaching dactyl hinge tangent ........................................... *Aceroides latipes*
7. Article 4 of pereopods 3-4 with lateral facial row of setae .................................................. 8
   — Article 4 of pereopods 3-4 without lateral facial row of setae .......................................................... 11
8. Carpal lobe of gnathopod 1 reaching full length on posterior margin of article 6 ................................. Aceroides sedovi
   — Carpal lobe of gnathopod 1 not reaching full length on posterior margin of article 6 .................. 9
9. Rostrum well developed .................................................. Aceroides kobjakovae
   — Rostrum poorly developed ................................................. 10
10. Carpal lobe on gnathopod 2 reaching one quarter along propodus ............................................ Aceroides calida
    — Carpal lobe on gnathopod 2 reaching one half along propodus ................................................... Aceroides luthkei
11. Gnathopod 1 carpal lobe equals posterior margin of article 6 ....................................................... Arrhis phyllonyx
    — Gnathopod 1 carpal lobe not equal to posterior margin of article 6 .......................................................... 12
12. Dactyl of pereopod 5 shorter than article 6 .................................................................................. Arrhis mediterraneus
    — Dactyl of pereopod 5 longer than article 6 .............................................................. Anoedecies hanseni

**Diagnosis.** Cutting edge of mandible scarcely projecting and either poorly or well toothed; molar medium, ridged. Inner lobes of lower lip separate or fused. Gnathopods similar to one another, subchelate, moderately stout, carpus with sharp strong posterior lobe projecting distalwards, partially guarding propodus; palm of both gnathopods oblique. Uropod 2 fully reaching end of rami on uropod 3. Uropod 3 well developed.

**Additional characters.** Mandibular palp article 2 usually straight (versus Arrhis); rostrum weak; coxae 3-4 excavate below; article 2 of antenna 1 usually shorter than article 1 (versus Arrhis); article 4 of pereopods 3-4 with anterior setae forming curved facial fan (versus Arrhis); or article 5 with weak or strong posterior or distal lobe (versus Arrhis).

**Key to Subgenera of Aceroides**

Pereopods 3-4 with article 5 apicoventrally lobate, article 5 thus 3 times as wide as article 6 .......... (Patoides)

Pereopods 3-4 with ordinary article 5-6 .......... (Aceroides)

**Variables.** Teeth of incisor strong or weak (type); inner lobes of lower lip separate (type) or fused; article 2 of antenna 1 as long as article 1 (A. kobjakovae); palp article 2 of mandible curved (A. kobjakovae); inner plate of maxilla 1 with 1 (type) to 6 setae; article 4 of gnathopods 1-2 with large sharp tooth (A. sedovi); facial fan of setae on article 4 of pereopods 3-4 absent (A. edax); article 4 of pereopods 3-4 usually with strong facial row of setae, articles 4 and 5 expanded or lobate or not.


**Habitat and distribution.** Marine, cold water, Arctic shallows to deep austral basins and trenches, 6-2475 m, 8 species.
Anoediceros Pirlot

Anoediceros Pirlot, 1932b: 82.

Type species. Anoediceros hansenii Pirlot, 1932b, original designation.

Taxonomy. Not significantly distinct from the Arrhis-Aceroides complex; see discussion with Aceroides.

Diagnosis. Cutting edge of mandible projecting and untoothed; molar medium, ridged, cup-shaped, dentate. Inner lobes of lower lip separate. Gnathopods similar to one another, subchelate, stout, carpus with blunt strong posterior lobe projecting distally at right angles, palm of both gnathopods oblique. Uropod 2 not fully reaching end of rami on uropod 3. Uropod 3 well developed.

Additional characters. Rostrum tiny; eyes absent; outer plate of maxilla 2 with thick bifid spine.

Relationship. Differing from Oediceroideos in the vestigial rostrum.

Species. Anoediceros hansenii Pirlot, 1932b [602B]; A. h. mozambis J.L. Barnard, 1961a [618A].

Habitat and distribution. Marine, Indonesia to Kenya, 835-3960 m, 2 species.

Arrhinopsis Stappers

Arrhinopsis Stappers, 1911: 40.

Fig.99. Oedicerotidae. A, Monoculodes carinatus; B, Monoculodes longirostris; C, Metaediceros fuegiensis; D, Oediceros saginatus; E, Arrhis phytony; F, Synchelidium haplocheles; G, Monoculodes packardi; H, Westwoodilla actifrons; I, Aceroides latipes; J, Westwoodilla caeca; K, Oediceros brevicornis.
Type species. *Arrhinopsis longicornis* Stappers, 1911, monotypy.

**Diagnosis.** Cutting edge of mandible strongly projecting and well toothed; molar medium, lacking ridges, with apical spine, bulging, setulose. Inner lobes of lower lip separate. Gnathopods similar to one another, subchelate, moderately stout, carpus with sharp strong posterior lobe guarding propodus; palm of both gnathopods oblique. Uropod 2 fully reaching end of rami on uropod 3. Uropod 3 well developed.

**Additional characters.** Mandibular palp article 3 as long as article 2.

**Sexual dimorphism.** Male antenna 2 increasing in length, as long as body.

**Relationship.** Differing from *Finoculodes* in the weak rostrum and lack of facial setae on article 4 of pereopods 3-4. From *Oediceros* and *Paraediceros* in the long carpal lobes of the gnathopods. From the *Perioculodes* group in the long article 3 on the mandibular palp. From *Monoculodopsis* and *Synchelidium* in the equality of the gnathopods.

See *Oediceros*.

**Species.** *Arrhinopsis longicornis* Stappers, 1911 (Stephensen, 1938b) (Gurjanova, 1951) (Just, 1980) [220 + B].

**Habitat and distribution.** Marine, Arctic, Gulf of Saint Lawrence to Novaya Zemlya, 90 m, 1 species.

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![Fig.100. Oedicerotidae and Exoedicerotidae. A, Exoediceropsis chiltoni; B, Monoculodes tenuirostratus; C, Oediceros saginatus; D, Westwoodilla caecula; E, Monoculodes carinatus; F, Bathyporeiapus magellanicas; G, Aceroides latipes; H, Paraediceros lynceus; I, Synchelidium haplochelae; J, Kanaloa mana; K, Paraediceroidea sinuata; L, Monoculodes tesseltus; M, Monoculodes borealis; N, Metoediceros fuegiensis.](image-url)
**Arrhis** Stebbing

*Fig.99E*

*Aceros* Boeck, 1861: 651 [homonym, Aves].
*Aceropsis* Stuxberg, 1880: 63 (nomen nudum, same type species).
*Arrhis* Stebbing, 1906: 248, 726 (new name).—Lincoln, 1979a: 356.

**Type species.** *Oediceros obtusus* Bruzelius, 1859, original designation.

**Status.** With priority, see discussion at *Aceroides* on the validity of *Aceroides* and *Anoediceros*.

**Diagnosis.** Cutting edge of mandible scarcely projecting and untoothed; molar medium, ridged. Inner lobes of lower lip separate. Gnathopods somewhat diverse, subchelate, slender, usually gnathopod 2 more slender, carpus of gnathopod 1 with blunt moderately developed posterior lobe projecting distalwards at right angles, lobe becoming obsolete on gnathopod 2, with carpus more elongate; palm of both gnathopods oblique. Uropod 2 fully reaching end of rami on uropod 3. Uropod 3 well developed.

**Addtional characters.** Mandibular palp article 2 strongly curved (versus most *Aceroides*); article 2 of antenna 1 longer than article 1 (versus most *Aceroides*).

**Variables.** Coxa 3 excavate below (type), not (*A. mediterraneus*); carpus of gnathopod 2 as short as on gnathopod 1 (*A. mediterraneus*), elongate (type); carpal lobes blunt (*A. kobjakovae*); dactyl of pereopod 5 extremely elongate (*A. mediterraneus*), dactyls of pereopods 3-5 slender (*A. mediterraneus*), spatulate (type).

**Relationship.** Differing from *Bathymedon*, *Westwoodilla* and the *Monoculodes* group in the ventrally excavate coxa 3 or 4.


**Habitat and distribution.** Marine, Arctic, weakly boreal, 1 doubtful Mediterranean, 10-2465 m, 4 species.

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**Bathymedon** Sars

*Bathymedon* Sars, 1895: 332.—Stebbing, 1906: 255.

**Type species.** *Halimedon longimanus* Boeck, 1871b, original designation.

**Diagnosis.** Cutting edge of mandible not projecting and untoothed; molar medium, ridged. Inner lobes of lower lip separate. Gnathopods somewhat diverse, subchelate, slender, usually gnathopod 2 more slender, carpus of gnathopod 1 with blunt moderately developed posterior lobe projecting distalwards at right angles, lobe becoming obsolete on gnathopod 2, with carpus more elongate; palm of both gnathopods oblique. Uropod 2 almost reaching end of rami on uropod 3. Uropod 3 well developed.

**Additional characters.** Article 2 of mandibular palp not as curved as in *Westwoodilla*, eyes usually poorly developed or absent; rostrum more feeble than in *Westwoodilla*.

**Variables.** Rostrum reduced (*B. banyulsensis*, etc.); articles 1-2 of antenna 1 short, article 2 shorter than 1 (*B. candidus*); article 2 of antenna 1 longer than article 1 (type); article 3 of antenna 1 longer than article 1 (*B. covilhani*); male antenna 1 elongate (*B. antennarius*); articles 4-5 of antenna 2 short and stout (*B. candidus*); epistome produced (*B. covilhani*); mandible more like *Monoculodes* (*B. monoculidiformis*); incisor with weak teeth (*B. antennarius*); mandibular palp article 3 strongly curved (*B. ivanovi*); posteroventral lobe of coxa 4 sharp (*B. caino*, etc.); gnathopods 1-2 almost identical (species A, etc.); carpus of gnathopod 2 lobate and short (*B. obtusifrons*, *B. banyulsensis*), lobe on carpus of gnathopod 2, though short, slightly guarding propodus (*B. nepos*); epimera 1-3 strongly setose below (*B. candidus*); pleonite 4 with dorsal spines (*B. palpalis*); telson excavate and with 2 stout spines (*B. palpalis*).

**Relationship.** There is little to distinguish *Bathymedon* from *Westwoodilla*. Generally we have placed in *Bathymedon* any species with either weak rostrum, poorly developed eyes, or straight article 2 of the mandibular palp; but some of those species have mixtures of the *Westwoodilla* form of the 3 cited characters.

**Species.** See Stephensen (1931a); *B. acutifrons* Bonnier, 1896 (Stebbing, 1906) (Ledoyer, 1983) [352BA]; *B. antennarius* Just, 1980 [253]; *B. banyulsensis* Ledoyer, 1983 [302B]; *B. caino* J.L. Barnard, 1967a [309B]; *B. candidus* J.L. Barnard, 1961a, 1967a [500A]; *B. covilhani*...

Habitat and distribution. Marine, cold water Arctic shallows then submergent to deeps of tropical seas, and New Zealand surface, 4-2857 m, 24 species.

Carolobatea Stebbing


Type species. Halimedon schneideri Stebbing, 1888, original designation.

Diagnosis. Cutting edge of mandible not projecting and toothed; molar medium, weakly ridged, cup-shaped, dentate, setulose. Inner lobes of lower lip separate. Gnathopods somewhat diverse, subchelate, slender, feeble, carpus with blunt small posterior lobe projecting distally but not especially guarding propodus; palm of gnathopod 1 transverse, of gnathopod 2 oblique. Uropod 2 fully reaching end of rami on uropod 3. Uropod 3 well developed.

Relationship. Characterised by the transverse palm on feeble gnathopod 1.


Habitat and distribution. Marine, Kerguelen and Auckland Island, 0 m, 1 species.

Cornudilla n.gen.

Type species. Westwoodilla cornuta J.L. Barnard, 1969b, here selected.

Etymology. Named for roots in Westwoodilla and cornuta.

Diagnosis. Cutting edge of mandible scarcely projecting and untoothed; molar large, lacking ridges, bulging. Inner lobes of lower lip separate. Gnathopods similar to one another, feeble, subchelate, carpus not lobate; palm of both gnathopods oblique. Uropod 2 fully reaching end of rami on uropod 3. Uropod 3 well developed.

Additional characters. Article 1 of antenna 1 with tooth; epistome produced; incisor with cornified callus; article 2 of mandibular palp produced and spinose basally, article 3 with tiny D-setae; palp of maxilla 1 apically expanded; outer plate of maxilla 2 narrow, inner plate of maxilliped narrow; coxa 4 longer than broad.

Relationship. Differing from Westwoodilla in the items of 'Additional characters' and the large smooth molar. Characterised as the only genus with non-triturative molar also lacking carpal lobes on the gnathopods.

Species. Cornudilla cornuta (J.L. Barnard, 1969b) [377].

Habitat and distribution. Marine, Pacific Mexico, Gulf of California, 19-46 m, 1 species.

Finoculodes J.L. Barnard


Type species. Finoculodes omnifera J.L. Barnard, 1971b, original designation.

Diagnosis. Cutting edge of mandible projecting and poorly toothed; molar small, lacking ridges, conical, with apical spine, setulose. Inner lobes of lower lip separate. Gnathopods somewhat diverse, subchelate, moderately stout, gnathopod 2 more slender, carpus with strongly developed posterior lobe projecting distally and guarding propodus; palm of gnathopod 1 oblique, of gnathopod 2 transverse. Uropod 2 elongate. Uropod 3 [unknown].

Additional characters. Article 3 of mandibular palp elongate (versus Perioculodes), article 4 of pereopods 3-4 with well-developed anterofacial row of setae.

Relationship. Differing from Perioculodes and Perioculopsis in the distinctly separated inner lobes of the lower lip, elongate article 3 of the mandibular palp and transverse palm of gnathopod 2. From Monoculopsis in the non-triturative molar and short article 2 of the peduncle on antenna 1.
The setae of pereopods 3-4 are possibly significant taxonomically. Monoculopodis and Synchelidium have much enlarged gnathopod 1. See Arrhinopsis.

Species. Finoculodes omnifera J.L. Barnard, 1971b [225B].

Habitat and distribution. Marine, Oregon, 800 m, 1 species.

Gulbarentsia Stebbing

Barentsia Stebbing, 1894: 25 [homonym, Bryozoa].

Type species. Barentsia hoeki Stebbing, 1894, monotypy.

Diagnosis. Cutting edge of mandible projecting and poorly toothed; molar small, ridged, cup-shaped, dentate. Inner lobes of lower lip separate. Gnathopods similar to one another, stout, carpus with blunt strong posterior lobe projecting distally at right angles but partially guarding propodus, palm of both gnathopods oblique. Uropod 2 barely reaching end of peduncle on uropod 3. Uropod 3 immense.

Additional characters. Eyes completely fused, forming a semicircular ring (versus Paraperioculodes).

Relationship. Characterised by the single dorsal ring-shaped eye which is also found in some of the members of the Perioculodes complex. The latter have a non-triturative molar.


Species. Gulbarentsia hoeki (Stebbing, 1894, 1906) (Gurjanova, 1951) [292].

Habitat and distribution. Marine, Kara Sea, depths unknown, 1 species.

Halicreion Boeck


Type species. Halicreion longicaudatus Boeck, 1871b (= Oediceros aequicornis Norman, 1869a), monotypy.

Diagnosis. Cutting edge of mandible slightly projecting and toothed; molar medium, ridged. Inner lobes of lower lip separate. Gnathopods similar to one another, subchelate, moderately stout, carpus short, with subsharp moderately developed posterior lobe partially guarding propodus; palm of both gnathopods oblique. Uropod 2 barely reaching end of peduncle on uropod 3. Uropod 3 immense.

Sexual dimorphism. Base of primary flagellum on antenna 1 with strong callynophore, densely armed.

Variables. Flagellum of antenna 1 about 32-articulate (H. ovalitelson) (versus 5-6 in type); of antenna 2, 84-articulate (versus about 5); telson excavate (type), not (H. ovalitelson).

Relationship. Characterised by the huge uropod 3. See Parhalimedon in Exoedicerotidae for relationships and character differences not included in diagnosis.


Habitat and distribution. Marine, north-western Norway to Antarctic, submergent South Africa, 55-732 m, 3 species.

Lopiceros J.L. Barnard

Oediceroides (Lopiceros) J.L. Barnard, 1961a: 93.

Type species. Oediceroides (Lopiceros) forensia J.L. Barnard, 1961a, original designation.

Diagnosis. Cutting edge of mandible projecting and well toothed; molar large, ridged. Inner lobes of lower lip separate. Gnathopods similar to one another, subchelate, stout, carpus with blunt small posterior lobe projecting distally at right angles, palm of both gnathopods oblique. Uropod 2 fully reaching end of rami on uropod 3. Uropod 3 well developed.

Additional characters. Article 3 of antenna 1 elongate; article 1 of flagellum on antenna 2 swollen and elongate.

Relationship. Differing from Oediceroides and Oediceros in the large antenna 1 with long article 3. From Monoculopodis in the weak lobes on the carpus of gnathopods. From Monoculodes in the long article 3 of antenna 1.

Species. Lopiceros forensia J.L. Barnard, 1961a [715A].


**Habitat and distribution.** Marine, Tasman Sea, 3580 m, 1 species.

**Machaironyx** Coyle


**Type species.** *Machaironyx muelleri* Coyle, 1980, original designation.

**Diagnosis.** Cutting edge of mandible scarcely projecting and untoothed; molar large, lacking ridges, cup-shaped. Inner lobes of lower lip separate. Gnathopods similar to one another, subchelate, feeble, carpus with subsharp small posterior lobe projecting distalwards at right angles; palm of both gnathopods oblique. Uropod 2 exceeding end of rami on uropod 3. Uropod 3 small, biramous.

**Additional characters.** Mandibular palp absent; peduncle of uropod 3 short.

**Relationship.** Differing from *Bathymedon* in the short uropod 3 with especially short peduncle, and the absence of the mandibular palp.

**Species.** *Machaironyx muelleri* Coyle, 1980 [273].

**Habitat and distribution.** Marine, Alaska, between Nunivak Island and Unimak Island, depth unknown, 1 species.

**Monoculodes** Stimpson

Figs 99A,B,G, 100B,E,L,M


**Type species.** *Monoculodes demissus* Stimpson, 1853, monotypy.

**Taxonomy.** Type obscure, diagnosis based on *M. carinatus* as depicted by Sars (1895).

**Diagnosis.** Cutting edge of mandible slightly projecting and toothed; molar large, ridged. Inner lobes of lower lip separate. Gnathopods diverse, gnathopod 1 stout, gnathopod 2 much more slender and longer, carpus with blunt strong posterior lobe guarding propodus, less on gnathopod 1, very strongly on gnathopod 2, palm of both gnathopods oblique. Uropod 2 almost reaching end of rami on uropod 3. Uropod 3 well developed.

**Additional characters.** Antenna 1 not longer than antenna 2, article 3 less than half as long as article 1 (versus *Monoculopods*); antenna 2 neither enlarged nor elongate (versus *Oediceroides*).

**Sexual dimorphism.** Male antenna 1 often with shorter peduncle, though many species retaining elongate articles (*M. packardi*, etc.), article 2 shorter than 1, base of flagellum with weak callynophore, most basal articles heavily armed; flagellum of antenna 2 elongate; peduncle with male bristles, article 4 occasionally shortened.

**Variables.** Eyes absent (rare); antenna 1 very short (*M. nyelii*); article 2 of antenna 1 frequently elongate; antenna 2 enlarged (*M. kroyeri*, merging to *Oediceroides*); coxa 2 with large spines (*M. crassirostris*); carpal lobes of gnathopods weak (*M. recandescens, M. scabriolusus, M. udor, M. vullimenti*, etc.); thus gnathopods merging to *Oediceroides*; carpus of gnathopod 1 not lobate (*M. murtensi*, etc.); carpal lobe of gnathopod 2 sharp (*M. coecus*); gnathopod 2 scarcely thinner nor longer than gnathopod 1 (*M. packardi, M. tenuirostratus*, etc.); propodus very stout (*M. abacus*, etc.); dactyls of pereopods 3-6 small (type, etc.), large and spatulate (*M. longirostris*, etc.), generally variable (others); telson emarginate (*M. coecus*, etc.).

**Relationship.** A large variable genus with several species transitional to other genera because of poorly developed carpal lobes on the gnathopods. Lacking the typical spines on antenna 2 of *Oediceroides* and *Oediceropsis*. Lacking the ventral excavations on coxa 3-4 of the Arrhis complex.

With better developed teeth on the incisor than in *Bathymedon-Westwoodiidae*.

See *Lopocerus, Monoculopods, Paraperiochopods* and *Pareodoeciceros*.

**Species.** See Bulycheva (1957c); Just (1980); Stephensen (1938b, 1940b, 1944a); *M. abacus* J.L. Barnard, 1961a [715B]; *M. acutipes* Ledoyer, 1983 [348 + Б]; *M. antarcticus* K.H. Barnard, 1932 [870 + Б]; *M. borealis* Boeck, 1871b, 1876 (Sars, 1895) (Stephensen, 1931a) (Gurjanova, 1951) (Lincoln, 1979a) [200]; *M. brevios Bulycheva, 1952 [391]; M. carinatus* (Bate, 1857d) (= *M. affinis* Bruzelius, 1859) (= *M. stimpsoni* Bate, 1862) (Sars, 1895) (Chevreux & Fage, 1925) (Lincoln, 1979a) (Ledoyer, 1983) [352]; *M. castalski Gurjanova, 1951 (Kudriashov, 1972b) [279]; M. chevreux Carusau, 1948, 1949 [348B]; *M. coecus* Gurjanova, 1946, 1951 (Gorbunov, 1946) [291 + Б]; *M. crassirostris* Hansen, 1888 (Stephensen, 1931a) (Gurjanova, 1951) (Ledoyer, 1972) [200]; *M. dembiensis* Bulycheva, 1952 [391+]; *M. demissus* Stimpson, 1853 (Bate, 1862) (Della Valle, 1893) (Stebbing, 1906) [254]; *M. diamesus* Gurjanova, 1936d, 1951 [287]; *M. diversisexis* J.L. Barnard, 1967a [309B]; *M. edwardsi* Holmes, 1905 (Shoemaker, 1926a, 1930a) (?Ledoyer, 1972) (not Bousfield, 1973) (not Dickinson et al., 1980) [363]; *M. emarginatus* J.L. Barnard, 1962e, 1964b, 1966a, 1971b [379]; *M.
**Habitat and distribution.** Marine, cosmopolitan in the sea, rarely freshwater in east Asia, 0-2800 m, 54 species.

**Monoculodopsis** Ledoyer

**Type species.** Monoculodopsis longimana Ledoyer, 1973a. original designation.

**Diagnosis.** Cutting edge of mandible not projecting and untoothed; molar small, lacking ridges, conical, with apical spine. Inner lobes of lower lip separate. Gnathopods diverse, subchelate, second slender, first stout, carpus with blunt or blunt strong posterior lobe guarding propodus; palm of both gnathopods oblique. Uropod 2 fully reaching end of rami on uropod 3. Uropod 3 well developed.

**Relationship.** Differing from Synchelidium in the non-chelate gnathopod 2. From the Periculodes group in the size difference in gnathopods, with gnathopod 1 being enlarged.

See *Finoculodes*.

**Species.** Monoculodopsis longimana Ledoyer, 1973a, 1979a, 1986 (Griffiths, 1975) [745].

**Habitat and distribution.** Marine, South Africa and Madagascar, 9-49 m, 1 species.

**Monoculodes** Sars

**Type species.** Monoculodes longicornis Boeck, 1871b, monotypy.

**Diagnosis.** Cutting edge of mandible slightly projecting and poorly toothed; molar medium, ridged. Inner lobes of lower lip separate. Gnathopods diverse, gnathopod 1 stout, gnathopod 2 much more slender and longer, carpus with blunt strong posterior lobe guarding propodus, less on gnathopod 1, very strongly on gnathopod 2; palm of both gnathopods oblique. Uropod 2 fully reaching end of rami on uropod 3. Uropod 3 well developed.

**Additional characters.** Antenna 1 longer than antenna 2, article 3 as long as article 1 (versus *Monoculodes*).

**Sexual dimorphism.** Male antenna 2 flagellum

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**gibbosus** Chevreux, 1888b, 1900a (Chevreux & Fage, 1925) (Kaneva-Abadzheva, 1964) (Mordukhai-Boltovskoi, 1969) (Ledoyer, 1983) (Moore, 1984b) [352 + 334]; **M. glyconicum** J.L. Barnard, 1962e, 1966a, 1971b [379 + B]; **M. griseus** Della Valle, 1893 (Walker, 1901) (Stiebing, 1906) (Chevreux, 1911d) (Ledoyer, 1983) [340 + B]; **M. hansenii** Stiebing, 1894, 1906 (Gurjanova, 1935b, 1951) (Gorbunov, 1946) (Oldevig, 1959) [220]; **M. hartmannae** J.L. Barnard, 1962e, 1964b, 1966a, 1969b [370]; **M. intermedius** Shoemaker, 1930a (Bousfield, 1973) (Just, 1980) [260]; **M. jazdzewskii** De Broyer, 1980 [838]; **M. kroyeri** Boeck, 1871b, 1876 (Sars, 1895) (Stephensen, 1931a) (Gurjanova, 1951) [216]; **M. latimanus** Boeck, 1896 (Goes, 1866) (Boeck, 1876) (Sars, 1895) (Stephensen, 1931a) (Gurjanova, 1951) [200 + B]; **M. lattissimus** Stephensen, 1931a (Gurjanova, 1951) (J.L. Barnard, 1966a, 1967a) (Ledoyer, 1983) [200BA]; **M. limnophilus** Tattersall, 1922a (Spandl, 1924a) (Shen, 1955) [031EFMR]; **M. l. japonicus** Nagata, 1965a (Takamaru & Ochiai, 1982) [390]; **M. longirostris** Goes, 1866 (Sars, 1895) (Stephensen, 1931a) (Dunbar, 1954) (Gurjanova, 1951) [290] (Just, 1980) [200 + B]; **M. mertensis** Gurjanova, 1951 [290]; **M. minutus** Gurjanova, 1930a, 1951 [292]; **M. murrus** J.L. Barnard, 1962e [373]; **M. nasutus** Bulycheva, 1952 [391 + B]; **M. necopus** J.L. Barnard, 1967a [309B]; **M. norvegicus** Boeck, 1861, 1876 (Sars, 1895) (Stephensen, 1931a) (Gurjanova, 1951) (J.L. Barnard, 1966a,b) [200 + B]; **M. nyei** Shoemaker, 1933c (J.L. Barnard, 1962e) (Ortiz, 1978) [490]; **M. packardi** Boeck, 1871b (Sars, 1895) (Stephensen, 1931a) (Gurjanova, 1951) (Lincoln, 1979a) (Just, 1980) (Ledoyer, 1983) [200 + BA + 340]; **M. pallidus** Sars, 1895 (Stephensen, 1931a, 1938b, 1940b) (Gurjanova, 1951) [200 + B]; **M. perditus** J.L. Barnard, 1966a [373]; **M. recandens** J.L. Barnard, 1967a, 1971b [379A]; **M. rostratus** Stephensen, 1931a [209B]; **M. scabrirostrus** K.H. Barnard, 1932 (Thurston, 1974a,b) (Bellan-Santini & Ledoyer, 1974) [870]; **M. schneideri** Sars, 1895 (Shoemaker, 1930a, 1955a) (Stephensen, 1938b) (Gurjanova, 1951) (Just, 1970) [200]; **M. semenovi** Gurjanova, 1938b, 1951 [391]; **M. simplex** Hansen, 1888 (Schellenberg, 1935e) (Stephensen, 1931a, 1944a) (Gurjanova, 1951) (Oldevig, 1959) [200]; **M. spinipes** Mills, 1962b (J.L. Barnard, 1962e, 1966b, 1971b) [368]; **M. subnudus** Norman, 1889b (= *M. falcatus* Sars, 1895) (Chevreux & Fage, 1925) (Stephensen, 1931a, 1940b) (Lincoln, 1979a) (Ledoyer, 1983) [355 + B]; **M. tardus** J.L. Barnard, 1967a [309B]; **M. synopthalmus** Bulycheva, 1952 [391]; **M. tenuirostratus** Boeck, 1871b (Sars, 1895) (Shoemaker, 1930a) (Stephensen, 1940b) [250 + BA]; **M. tesselatus** Schneider, 1884 (Sars, 1895) (Shoemaker, 1930a) (Stephensen, 1931a, 1940b) (Gurjanova, 1951) [250]; **M. tuberculatus** Boeck, 1871b (Sars, 1895) (Stephensen, 1931a) (Gurjanova, 1951) (Lincoln, 1979a) [200]; **M. uncinitus** Bulycheva, 1952 [391]; **M. vibei** Just, 1980 [253]; **M. zernovi** Gurjanova, 1938b, 1951 (Mills, 1962b) (Kadjaraschov, 1972b) [230]; species, allied to *M. tesselatus* Schneider, Marine Biological Association of the United Kingdom, 1957 [242]; species, Just, 1970, 1980 [253]; species(s), Ledoyer, 1977 [348 + B]; species (= *M. dwardsi* identification of Bousfield, 1973 and all subsequent authors based on that depiction) [361].
Variables. Palp of maxilla 1 with setae on sides (M. vallentini); lobes on carpus of gnathopods very short (M. vallentini).

Relationship. Differing from Monoculodes in the elongate article 3 of antenna 1. From Lopicerus in the guarding of the propodus by the carpal lobes of the gnathopods.

Species. Monoculopsis longicornis (Boeck, 1871b) (?= M. longicornis of Oldevig, 1959) (Sars, 1895) (Stephensen, 1931a, 1938b, 1944a) (Gurjanova, 1951) (Bulycheva, 1957c) [220]; M. vallentini Stebbing, 1914b (Schellenberg, 1931) (K.H. Barnard, 1932) [866].

Habitat and distribution. Marine, bipolar only, 0-115 m, 2 species.

Oediccerina Stephensen

Oediccerina Stephensen, 1931a: 250.

Type species. Oediccerina ingolfi Stephensen, 1931a, monotypy.

Diagnosis. Poorly described: Cutting edge of mandibular projecting and well toothed; molar large, ridged, cup-shaped. Inner lobes of lower lip separate. Gnathopods [unknown, ?similar to one another, somewhat diverse, gnathopods 1-2 simple, subchelate, slender, moderately stout, gnathopod 2 simple, subchelate, slender, moderately stout, usually gnathopod 2 much more slender, carpus with sharp blunt strong small well moderately developed posterior lobe projecting distalwards at right angles but partially not especially guarding propodus, lobe becoming obsolescent on gnathopod 2; palm of both gnathopods 1 and 2 transverse, oblique, chelate, of gnathopod 2 transverse. oblique. chelate]. Uropod 2 [unknown, ?not barely fully reaching exceeding end of peduncle on uropod 3] Uropod 3 [unknown, well developed. vestigial].

Additional characters. Rostrum long; article 2 of antenna 1 as long as article 1, article 3 half as long, article 1 with tooth; coxa 4 with huge posterior lobe.

Relationship. With the gnathopods unknown, this genus remains obscure; characterised by the combination of the triturative molar, toothed incisor, separated inner lobes of lower lip, tooth on article 1 of antenna 1, elongate article 2 of antenna 1, elongate article 1 of antenna 1, elongate article 2 of antenna 1 and giant lobe of coxa 4.

Species. Oediccerina ingolfi Stephensen, 1931a (Gurjanova, 1951) [209A]; O. megalopoda Ledoyer, 1986 [694B].

Habitat and distribution. Marine, between Faeroes and Jan Mayen; near Madagascar; 200-1802 m, 2 species.

Oedicceroides Stebbing

Fig.98B


Type species. Oedicceropsis rostrata Stebbing, 1883, selected by Pirlot, 1932b.

Diagnosis. Cutting edge of mandibular projecting and toothed; molar large, ridged. Inner lobes of lower lip separate. Gnathopods similar to one another, moderately stout, or weak, carpus with blunt, strong to small posterior lobe projecting distalwards at right angles, not guarding propodus; lobe sometimes becoming obsolescent; palm of both gnathopods oblique. Uropod 2 reaching end of rami on uropod 3. Uropod 3 well developed.

Additional characters. Antennae 1 small; antennae 2 usually enlarged and elongate (versus Monoculodes), usually with heavy spines as in Oedicceroides; inner plate of maxilla 1 with 3+ setae (versus Paroediceroides); outer plate of maxilla 2 lacking stout spine (versus Anoediceros).

Sexual dimorphism. Both sexes often with calceoli on flagellum of antenna 2.

Variables. Article 2 of antenna 1 longer than article 1 (O. antennatus); antenna 2 weak (O. cystifera, O. brevirostris); article 3 of mandibular palp long or medium; see section below on coxa 4; propodus of gnathopods 4 times as long as carpus (O. microcarpus); carpal lobes occasionally slightly geniculate and weakly guarding propodus (O. wolfii, O. cystifera, etc.); dactyl of pereopod 7 slender or spatulate; article 4 of pereopods 5-6 widely expanded and lobate (O. pirilotti); telson emarginate (O. emarginata, O. limpieza only); pleon or back tuberculate and ridged or not.

Taxonomy. A section with coxa 4 bearing a large sharp lobe contains: O. lahilleti, O. morosa and O. trepadora. Despite coxa 4, these species are not in Paroediceroides because they lack eyes and have the second antenna typical of Oedicceroides and not Paroediceroides.

Relationship. Differing from Paraperioculodes in the short antenna 1, large antenna 2 with long spines and lack of eyes in the body of head; however P. belgicae (see) has the proper antenna 1 and antenna 2 of Oedicceroides but bears dorsally fused eyes in the body.
of head; to make the generic key work *O. belgicae* is temporarily assigned to *Paraperiociulodes*.

Differing from *Oediceropsis* in the well-developed rostrum. From the Bathymedon-Westwoodilla complex in the better toothed incisor and generally larger gnathopods with better developed carpal lobes.

Without the modification on coxae 3-4 of the *Arrhis* complex.

See *Monoculodes*, *Parexodiceroides* and *Lopiceros*.


**Type species.** *Oediceropsis brevicornis* Liljeborg, 1865a, monotypy.

**Diagnosis.** Cutting edge of mandible projecting and well toothed; molar medium, ridged. Inner lobes of lower lip separate. Gnathopods similar to one another, subchelate, moderately stout, carpus with blunt strong posterior lobe projecting distalwards at right angles, not guarding propodus; palm of both gnathopods oblique. Uropod 2 fully reaching end of rami on uropod 3. Uropod 3 well developed.

**Additional characters.** Eyes lateral and poorly developed (type); articles 4-5 of antenna 2 with several very large, thick, or elongate and curved spines (versus *Monoculodes*).

**Variables.** Eyes present, weak, lateral (type), absent (most species); fused dorsally (*O. sinuata*); posteroventral lobe of coxa 4 blunt (type, etc.), sharp (*O. sinuata*, etc.); telson excavate (*O. sinuata*).

**Relationship.** Bridged to *Paroediceroides* through *O. proxima*.

Scarcely differing from *Monoculodes*, to which there is some transition in the more right-angular direction of the carpal lobes on the gnathopods and presence of unusual spines on antenna 2.

Like *Oediceroides* but rostrum small or absent. See comments on *Parapcriociulodes belgicae* in *Oediceroides*.

**Removals.** *Oediceropsis morosa* J.L. Barnard, 1966a, to *Oedicerodes: O. sinuata* Schellenberg, 1931, to *Paroediceroides; O. trepadora* J.L. Barnard, 1961, 1966a, to *Oediceroides*.

**Species.** *Oediceropsis brevicornis* Liljeborg, 1865a (Sars, 1895) (Stephensen, 1938b) (Ledoyer, 1970, 1981) [352 + B]; *O. elisula* J.L. Barnard 1966a [310B]; *O. proxima* Chevreux, 1908g, 1935 [304B].

**Habitat and distribution.** Marine, northern hemisphere, cold water or deep, 80-1550 m, 3 species.

*Oediceropshis* Krøyer

Figs 98D, 99D, 100C


**Type species.** *Oediceropsis saginatus* Krøyer, 1842, monotypy.

**Diagnosis.** Cutting edge of mandible strongly projecting and well toothed; molar small, lacking ridges, bluntly conical, bulging. Inner lobes of lower lip...
separate. Gnathopods similar to one another, subchelate, moderately stout, carpus with blunt strong posterior lobe projecting distalwards at oblique angles but partially guarding propodus; palm of both gnathopods oblique. Uropod 2 fully reaching end of rami on uropod 3. Uropod 3 well developed.

Relationship. Differing from Monoculodopsis in the relatively even size of the gnathopods and less guardant carpal lobes; the latter is also true in distinguishing Oediceros from the Perioiculodes complex, Finoculodes and Arrhinopsis. In addition, Oediceros differs from Arrhinopsis in the large rostrum.

See Paroediceros.


Habitat and distribution. Marine, Arctic, 0-140 m, 6 species.

Paroediceros Bousfield, 1983


Type species. Parexoediceros latimerus Bousfield, 1983, original designation.

Diagnosis. Partly based on P. pirloti. Cutting edge of mandible slightly projecting and well toothed; molar medium, ridged. Inner lobes of lower lip separate. Gnathopods somewhat diverse, subchelate, stout, carpus with blunt strong posterior lobe projecting distalwards at slight angle and partially guarding propodus, lobe becoming thinner on gnathopod 2; palm of both gnathopods oblique. Uropod 2 fully reaching end of rami on uropod 3. Uropod 3 well developed.

Additional characters. Eyes appressed dorsally at base of rostrum, with raphus; antenna 1 exceeding peduncle of antenna 2, latter without spines of Oediceroides; article 4 of pereopod 5 expanded and lobate, enveloping article 5, partially so on pereopod 6; article 2 of pereopods 5-6 slender.

Relationship. Not distinguished from any other genus by describer and keys close to Oediceroides and Monoculodes but more details needed.

If P. pirloti belonging here then differing from Oediceroides in the paired dorsal eyes, widely expanded article 4 of pereopod 5 enveloping article 5, and lack of long spines on antenna 2.

Differing from Oediceropsis in the large rostrum, long antenna 1 and lack of long spines on antenna 2. From Monoculodes in the condition of pereopod 5.
Species. *Parexoeidiceros latimerus* Bousfield, 1983 [783]; *P. pirloti* (Sheard, 1936a) [785].

Habitat and distribution. Marine, Tasmania and South Australia, beach surf zone, 2 species.

*Parexoeidiceros* Schellenberg

*Fig.100K*

Type species. *Parexoeidiceros sinuata* Schellenberg, 1931: 146.

Diagnosis. Cutting edge of mandible projecting and well toothed; molar large, ridged. Inner lobes of lower lip separate. Gnathopods somewhat diverse, subchelate, stout, carpus on gnathopod 2 with blunt strong posterior lobe projecting distalwards, guarding propodus, lobe becoming obsolescent on gnathopod 1; palm of both gnathopods oblique. Uropod 2 fully reaching end of rami on uropod 3. Uropod 3 well developed.

Relationship. Differing from *Oediceropsis* in the shortened carpal lobe of gnathopod 1. This specifically shortened lobe distinguishes *Parexoeidiceros* from all other genera bearing a non-triturative molar.

Nomenclature. Stephensen (1931a, 1938b, 1940b) believes Goes (1866) had *P. lynceus* when describing *P. propinquus* and therefore *P. microps* is the valid name for the *P. propinquus* concept.

Species. See Gurjanova (1951); Stephensen (1931a, 1938b); *P. curvirostris* (Hansen, 1888) (Stebbing, 1906) (*?Stephensen, 1940b* [216]; *P. intermedius* Stebbing, 1906 (= *P. microps* identification of Stebbing, 1894; Hansen, 1887) (Stephensen, 1938b) (?Just, 1970) [251]; *P. lynceus* (M. Sars, 1858) (=*P. nubilatus* Packard, 1867) (G.O. Sars, 1895) (Shoemaker, 1930a) (Just, 1980) [220 + B]; *P. macrocheir* (Sars, 1879, 1885, 1886) (Oldevig, 1959) [208B]; *P. propinquus* (Goes, 1866) (= *P. microps* Sars, 1883, but see Stephensen, 1931a) (Sars, 1895) (Bulycheva, 1957–1961) [238].

Habitat and distribution. Marine, Arctic-boreal, 2–1836 m, 5 species.

*Perioculodes* Sars

*Fig.98A*

Type species. *Monoculodes longimanus* Bate & Westwood, 1868, monotypy.

Diagnosis. Cutting edge of mandible projecting and well toothed; molar medium, lacking ridges, subconical, bulging, setulose. Inner lobes of lower lip separate. Gnathopods somewhat diverse, moderately stout, large, carpus on gnathopod 2 with blunt strong posterior lobe projecting distalwards, guarding propodus, lobe becoming obsolescent on gnathopod 1; palm of both gnathopods oblique. Uropod 2 fully reaching end of rami on uropod 3. Uropod 3 well developed.

Additional characters. Eyes forming dorsal rim.
brows; telson entire (versus Perioculopsis); dactyls of pereopods 3-5 shorter than article 6.

Sexual dimorphism. Antenna 1 of male usually with article 3 elongate (if not already elongate in female), base of primary flagellum with callynophore; article 3 of mandibular palp often elongate only in males.

Variables. Rostrum elongate (P. pallidus); article 3 of female antenna 1 elongate (P. longimanus, P. megapleon), not (P. aequimanus); lacinia mobilis weak (P. pallidus); article 3 of mandibular palp as long as article 2 (P. brevicarpus); dactyl of maxilliped short (P. pallidus); coxa 1 posteroventrally expanded (P. aequimanus, P. serra, P. megapleon); coxa 3 with anteroventral point (P. pallidus); peduncle of uropod 7 ?short (P. pallidus); outer ramus of uropod 1 very short; inner ramus serrate (P. serra); uropods naked (P. pallidus); uropods 2-3 short, rami unequal on uropod 3 (P. pallidus); pedal of uropod 3 shortened (P. cerasinus); telson emarginate (type).

Relationship. Differing from Finoculodes and Arrhinopsis in the short article 3 of the mandibular palp; Finoculodes also has narrowed gnathopod 2 with transverse palm.

The fused inner lobes of the lower lip and elongate gnathopods with fully guardant carpal lobes distinguish Perioculodes from Oediceros and Paroediceros.

See Perioculopsis, Sinoediceros and Monoculodopsis.

Taxonomy. There remain many doubts about identifications in P. aequimanus and P. longimanus. Distributions are therefore cited mainly for the Atlantic-Mediterranean area.


Habitat and distribution. Marine, tropical, weakly boreal to North Sea, frequently neritic in plankton tows, 0-370 m, 9 species.

Perioculopsis Schellenberg

Perioculopsis Schellenberg, 1925a: 145.

Type species. Perioculopsis lophopus Schellenberg, 1925a, monotypy.

Diagnosis. Cutting edge of mandible slightly projecting and untoothed or teeth obsolete; molar small, lacking ridges, with apical spines. Inner lobes of lower lip [?fused]. Gnathopods similar to one another, subchelate, slender, carpus with blunt strong posterior lobe guarding propodus; palm of both gnathopods oblique. Uropod 2 fully reaching end of rami on uropod 3. Uropod 3 well developed.

Variable. Article 1 of antenna 1 with tooth (type); coxa 6 bevelled posteroventrally (type); telson emarginate (type).

Relationship. Differing from Perioculodes in the untoothed incisors.

Species. Perioculopsis lophopus Schellenberg, 1925a [445]; species, (= 'Oediceroidae genus species' of Imbach, 1969) [655].

Habitat and distribution. Marine, Ghana and Vietnam, 13-15 m, 2 species.

Pontocrates Boeck


Type species. Oediceros (sic) norvegicus Boeck, 1861, selected by Boeck, 1876 (= Kroyera arenaria Bate, 1858a).

Diagnosis. Cutting edge of mandible projecting and well toothed; molar medium, ridged. Inner lobes of lower lip poorly developed but separated from each other by incision, outer lobes thus widely gaping. Gnathopods diverse, gnathopod 1 moderately stout, gnathopod 2 slender, carpus of both pairs with sharp strong posterior lobe projecting distallywards but partially (gnathopod 1) or especially (gnathopod 2) guarding propodus; palm of gnathopod 1 oblique, of gnathopod 2 chelate. Uropod 2 fully reaching end of rami on uropod 3. Uropod 3 well developed.
Variables. Coxa 2 strongly tapering distally (P. arenarius).

Relationship. This is the only other genus besides Synchelidium with chelate gnathopod 2; differing from Synchelidium in the triturative molar and free lobe of carpus on gnathopod 2.

Species. Pontocrates altamaria (Bate & Westwood, 1863) (= P. arenarius identification of Chevreux & Fage, 1925) (Sars, 1895, supplement pl. 7) (Schellenberg, 1942) (Nagata, 1960) (Lincoln, 1979a) [240 + 395]; P. arcuatus Sars, 1895 (= P. norvegicus identification of Sars, 1895: pl. 111) (Stephensen, 1931a, 1938b, 1940b) (Gurjanova, 1951) (Bulycheva, 1957c) [220]; P. arenarius (Bate, 1858a) (= Oedicerus (sic) norvegicus Boeck, 1861; Chevreux & Fage, 1925) (Sars, 1895, suppl. pl. 6-7) (Schellenberg, 1942) (Gurjanova, 1951) (Lincoln, 1979a) [352 + 391].

Habitat and distribution. Marine, Arctic-boreal, 3-100 m, 3 species.

Sinoediceros Shen


Type species. Sinoediceros homopalatus Shen, 1955, original designation.

Diagnosis. Cutting edge of mandible not projecting and poorly toothed, teeth obsolescent; molar small, lacking ridges, bulging, with apical spines. Inner lobes of lower lip fused. Gnathopods similar to one another, subchelate, slender, carpus with sharp strong posterior lobe projecting distally and guarding propodus, lobe becoming less appressed to propodus on gnathopod 1, and fused to propodus on gnathopod 2; palm of gnathopod 1 transverse or oblique, of gnathopod 2 chelate. Uropod 2 fully reaching end of rami on uropod 3. Uropod 3 well developed.

Additional characters. Carpus of gnathopod 2 actually formed of articles 4-5 or one of these obsolescent, lobe mostly fused to propodus.

Variables. Pleonites 1-3, especially 3, reduced (S. micropleon).

Relationship. Besides Pontocrates, this is the only other genus with chelate gnathopod 2. Differing from Pontocrates in the non-triturative molar and amalgamation of the carpal lobe on gnathopod 2 to the propodus.


Habitat and distribution. Marine, cosmopolitan, tropical to boreal, 0-800 m, 12 species.
Westwoodilla Bate

Figs 98E, 99HJ, 100D


Type species. Westwoodia caecula Bate, 1857d, monotypy.

Diagnosis. Cutting edge of mandible not projecting and untoothed; molar large, ridged. Inner lobes of lower lip separate. Gnathopods similar to one another, feeble, subchelate, carpus with blunt small posterior lobe projecting distalwards at right angles, lobe becoming obsolescent on gnathopod 2; palm of both gnathopods oblique. Uropod 3 fully developed. Coxae small or large; plates of maxilla 2 subcircular or slender-trapezoidal. Palp of maxilliped 3 or 4-articulate. Dactyls of gnathopods overlapping palms or not. Outer ramus of third uropod 1 to 2-articulate. Telson short, entire.

Additional characters. Article 2 of mandibular palp more strongly curved than in Bathymedon.

Relationship. Difficult to separate from Bathymedon except that most species of Westwoodilla have well-developed eyes and large rostra. Most species of Bathymedon are said to have an uncurved article 2 on the mandibular palp. See Bathymedon for relationships to other genera.


Habitat and distribution. Marine, cosmopolitan, preferring cold or deep water, 2-2900 m, 10 species.

PAGETINIDAE K.H. Barnard, 1931a

Diagnosis. Body moderately compressed, subcylindrical. Inner (and often outer) plates of maxilliped reduced. Coxae small but touching, coxa 1 expanded and with posteroventral lobe (sharp or blunt). Urosomites 2-3 coalesced. Uropod 3 uniramous.

See Colomastigidae, Dexaminidae, Eophliantidae, Sebidae and Stenothoidae.

Description. Lateral lobes of head poorly developed, head lacking sinus for antenna 2. Eyes present. Antennae short, accessory flagellum absent. Labrum incised. Incisor toothed, molar obsolescent, rakers weak or absent, palp 3-articulate, setae sparse or vestigial. Labium without inner lobes (or they are vestigial), outer lobes widely separated, mandibular lobes present (or ?absent). Inner plate of maxilla 1 present or absent, when present with 1 seta, outer plate with 2-6 spines (often thin and seta-like), palp small or large, 1-articulate. Plates of maxilla 2 feeble, plates expanded and subcircular, or slender and trapezoidal, setae weak or absent. Inner plates of maxillipeds absent or vestigial, outer plates well developed or absent.

All coxae short and similar, coxa 4 not excavate, coxa 5 as long as 4. Gnathopods feeble, alike but gnathopod 2 slightly larger, carpus short, unlobate, propodus trapezoidal, weakly geniculate, expanding apically, palms slightly oblique, dactyls thick and overlapping palms or not. Pereopods short, article 2 of pereopods 5-7 scarcely expanded.

Uropods 1-2 without spination or with embedded apical spines on rami, lengths of rami slightly diverse. Uropod 3 small, naked, of embryonic blunt thick form, ramus about as long as peduncle, 1 to 2-articulate. Telson short, entire.

Variables. Plates of maxillae and maxillipeds variable in size, presence, and setation, thus inner plate of maxilla 1 present or absent, palp small or large; plates of maxilla 2 subcircular or slender-trapezoidal. Palp of maxilliped 3 or 4-articulate. Dactyls of gnathopods overlapping palms or not. Outer ramus of third uropod 1 to 2-articulate.

Relationship. Differing from Colomastigidae and Eophliantidae in the presence of mandibular palp and reduced inner plates on the maxillipeds. From Dexaminidae in the uniramous uropod 3, odd maxilliped and small, entire telson. From Stenothoidae and allies in the equality of coxae 1-3. From Sebidae in the non-chelate gnathopods and reduced plates of the maxillipeds. From Nihotungidae in the short and subequal coxae 1-4, subcylindrical body and reduced plates of the maxillipeds.
Pagetina K.H. Barnard

Fig.101


Heterocressa Nicholls, 1938: 55 (Heterocressa monodi Nicholls, 1938, original designation).

Type species. Pagetina genarum K.H. Barnard, 1931a, original designation.

Diagnosis. With the characters of the family.


Habitat and distribution. Marine, Antarctica north to Falkland Islands, 1-270 m, 4 species (at least one pelagic).

PARACALLIOPIDAE Barnard & Karaman, 1982

Diagnosis. Body plan ordinary but urosomites 2-3 amalgamated; pereopod 7 elongate and different from shorter pereopods 5-6, dactyl of pereopod 7 elongate and setose; gnathopods sexually diverse, mitenform in female, enlarged mitenform in male, with thin carpus and expanded propodus twisting inward on death. Telson of ordinary length, entire.

Additional characters. Rostrum and incision for antenna 2 ordinary, eyes paired.

Sexual dimorphism. Gnathopods diverse, large in male, small in female.

See Eusiridae, Exoedicerotidae and Oedicerotidae.
Relationship. Differing from Exoedicerotidae in the lack of apical spines on rami of uropods 1-2. From Oedicerotidae in the paired eyes, fused urosomites (occasionally present in Oedicerotidae) and non-galeate head and odd gnathopods. From Eusiridae-Calliopiidae in the fused urosomites 1-2 and odd gnathopods. From Dexaminiidae in the greatly elongate pereopod 7 with elongate setose dactyl and the unclert telson.

Key 1 to Genera of Paracalliopiidae

1. Palm of male gnathopod 2 with 2 thick spines, mandibular palp absent ................................................. Katocalliope
   — Palm of male gnathopod 2 with 4 thick spines, mandibular palp present .................................................. 2

2. Inner plate of maxilla 1 with 1 seta ................................................................. Indocalliope
   — Inner plate of maxilla 1 with 8+ setae ................................................................. Paracalliope

Key 2 to Genera of Paracalliopiidae

1. Inner plates of maxillae 1-2 densely setose medially ................................................. Paracalliope
   — Inner plates of maxillae 1-2 not setose medially ...................................................... 2

2. Mandibular palp present, peduncle of uropod 3 elongate, epimera with small tooth, palp of maxilliped strongly exceeding outer plate ................................................................. Indocalliope
   — Mandibular palp absent, peduncle of uropod 3 short, epimera smooth, palp of maxilliped not exceeding outer plate ................................................................. Katocalliope

Key 3 to Genera of Paracalliopiidae

1. Mandible lacking palp, peduncle of uropod 3 short, palp of maxilliped not exceeding outer plate ................................................. Katocalliope
   — Mandible with long palp, peduncle of uropod 3 elongate, palp of maxilliped strongly exceeding outer plate ...................................................... 2

2. Medial margins of maxillae 1-2 naked ................................................................. Indocalliope
   — Medial margins of maxillae 1-2 setose ................................................................. Paracalliope

Indocalliope Barnard & Karaman

Type species. Paracalliope indica K.H. Barnard, 1935, original designation.

Diagnosis. Inner plates of maxillae 1-2 not setose medially.


Habitat and distribution. Marine, brackish, eastern India, 0 m, 1 species.
**Katocalliope** Barnard & Drummond

*Katocalliope* Barnard & Drummond, 1984b: 147.

**Type species.** *Katocalliope kutyeri* Barnard & Drummond, 1984b, original designation.

**Diagnosis.** Paracalliopiidae lacking mandibular palp; inner plate of maxilla 1 poorly armed (generally with 1 seta only); brood plates unexpanded; epimera rounded (lacking notches or small teeth); peduncle of uropod 3 short.

**Relationship.** *Katocalliope* differs from *Paracalliope* and *Indocalliope* in the lack of teeth on the epimera, the very short palp of the maxilliped, the short uropod 3 with short peduncle, and the absence of a mandibular palp. Pereopods 3 to 6 of *Katocalliope* are more markedly fossorial than those of the other 2 genera; the articles of these pereopods are thicker and shorter, and much better armed than those of *Paracalliope* and *Indocalliope*.

In addition, *Paracalliope* differs from *Katocalliope* in the medially setose inner plate of maxilla 1 and the expanded oostegites. The latter have not been described for *Indocalliope*.

The slightly tapering coxa 3 of *Katocalliope* and unshortened outer ramus of uropod 2 cannot be evaluated as generic characters until more species have been described and these differences confirmed.

There may possibly be some generic value in the greatly elongate setae of the anterior coxae on *Katocalliope*.

A few species of *Paracalliope* are known to have a vestigial accessory flagellum, but in others its presence

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**Fig. 102.** Paracalliopiidae. A, *Paracalliope karitane*; B, *Paracalliope novizealandiae*; C, *Paracalliope fluviatilis*.
requires confirmation. The mandible of *Katocalliope*, besides lacking a palp, is characterised by greater elongation of the molar and extension of the base of the incisor than seems to be typical of *Paracalliope*; but this character also needs further investigation in some species of *Paracalliope*. Articles 2 and 3 of antenna 1 are short and equal in *Katocalliope* and the facial row of setae on maxilla 2 is poorly developed.

The fossorial character and general facies of *Katocalliope* are distinctive within the Paracalliopiidae and bear strong resemblance to two closely allied families, Oedicerotidae and Exoedicerotidae.

**Species.** *Katocalliope kutyeri* Barnard & Drummond, 1984b [631].

**Habitat and distribution.** Marine, Australia, near Brisbane, sand beach intertidal, 1 species.

*Paracalliope* Stebbing


**Type species.** *Calliope fluviatilis* Thomson, 1879b, original designation.

**Diagnosis.** Inner plates of maxillae 1-2 setose medially.

**Removal.** *Paracalliope fernandoi* Wignarajah, 1958, to superfamilly Talitrioida, incertae sedis.


**Habitat and distribution.** Marine, New Zealand, Australia, New Caledonia, Philippines, Fiji, weakly marine, mostly estuarine to freshwater, 0 m, 8 species.

**PARACRANGONYCTIDAE** Bousfield, 1982 [see Barnard & Barnard (1983)]

**PARALEPTAMPHOPIDAE** Bousfield, 1983

See Eusiridae

**PARAMELITIDAE** Bousfield, 1977 [see Barnard & Barnard (1983)]

**PARDALISCIDAE** Boeck, 1871b

**Diagnosis.** Body laterally compressed; coxae short; accessory flagellum well developed; molar absent, incisor and body of mandible flat, inner plates of maxillipeds short to evanescent.

See Stilipedidae (= Astyridae), Iphimediidae.

**Description.** Rostrum variable but prominent; head occasionally protuberant; mouthparts rarely grouped in conical bundle; upper lip incised or rounded; mandibles flat, almost elytriform, palp 3-articulate or absent, article 3 often short; outer plates of maxillipeds often small; coxae often very short, coxa 1 not expanded distally, coxa 5 often as long as coxae 1-4; gnathopods powerful or feeble; rami of uropod 3 elongate, lanceolate or subfoliaceous, occasionally uropod 3 reduced in size; telson elongate, often short, cleft or entire.

**Sexual dimorphism.** Primary and accessory flagella often sexually dimorphic, enlarged or with callynophore in male; but occasional genera with callynophore also in female; teeth of urosome larger in male.

**Relationship.** Differing from Stilipedidae in the unexpanded coxa 1 and well-developed accessory flagellum (one exception probably an aberration, ? type species of *Halicoides*). From Iphimediidae in the flat mandible, the small coxae, especially coxa 4, and in the absence of deep posterior teeth or excavations on coxa 4.

All Oedicerotidae have fossorial pereopods with pereopods 5-6 short and pereopod 7 elongate, and accessory flagellum vestigial. Vitjazianidae have bulky mandibles, large molars and large plates on the maxillipeds.
Key to Genera of Pardaliscidae

1. Telson entire ........................................................................................................................................... 2
   — Telson cleft ........................................................................................................................................... 3

2. Carpus of gnathopods dominant, propodus small, dactyl serrate, uropod 3 ordinary ....... *Epereopus*
   — Propodus of gnathopods dominant, carpus small, dactyl unserrate, uropod 3 reduced ............ *Parpano*

3. Carpus of gnathopods strongly dominant, elongate, propodus short, (simple) ......................... 4
   — Carpus of gnathopods not strongly dominant, propodus well developed, scarcely shorter than carpus or propodus strongly dominant .................................................................................................................. 7

4. Dactyl of gnathopods serrate ........................................................................................................... *Pardalisca*
   — Dactyl of gnathopods setulose or smooth .................................................................................. 5

5. Article 2 of antenna 1 longer than article 1, palp of maxilla 1 not expanded apically ............. *Pardaliscoideus*
   — Article 2 of antenna 1 shorter than article 1, palp of maxilla 1 expanded apically .................. 6

6. Coxa 6 large and covering coxa 7, maxilla 2 vestigial ................................................................. *Necochea*
   — Coxa 6 small and not hiding coxa 7, maxilla 2 well developed ............................................... *Princaxelia*

7. Mouthparts arranged in tightly conical bundle, some parts styliform ........................................ 8
   — Mouthparts arranged in loose quadrate bundle, parts not styliform .......................................... 9

8. Mandibular palp vestigial, outer plate of maxilliped huge and palp not longer than outer plate ....... *Rhynohalicella*
   — Mandibular palp 3-articulate, outer plate of maxilliped medium, palp well extended beyond outer plate .... *Halicella*

9. Telson as long as broad (cleft one third or less) ........................................................................... 10
   — Telson longer than broad (cleft one third or more) .................................................................. 12

10. Mandibular palp absent, uropod 3 very small, propodus of gnathopod 1 dominant ............. *Tosilus*
    — Mandibular palp present, uropod 3 ordinary, carpus and propodus of gnathopod 1 of equal length ........ 11

11. Pereopodsprehensile ............................................................................................................. *Parahalice*
    — Pereopods simple ............................................................................................................. *Halice*
12. Teeth on urosome strongly developed ................................................................. 13
— Teeth on urosome vestigial or absent ................................................................. 16
13. Gnathopods stout, propodus and carpus expanded ............................................. Nicippe
— Gnathopods slender ...................................................................................... 14
14. Maxilla 2 short, palp of maxilla 1 apically expanded, right incisor toothed .......... Caleidoscopsis
— Maxilla 2 long, palp of maxilla 1 not expanded apically, right incisor smooth ......... 15
15. Gnathopod 2 simple ..................................................................................... Halice
— Gnathopod 2 subchelate ................................................................................ Aarculia
16. Gnathopods stout, subchelate ......................................................................... Spelaeonicippe
— Gnathopods slender, simple ............................................................................ 17
17. Primary flagellum with callynophore, accessory flagellum fused in male, maxilla 1 palp not expanded apically, neither mandible deeply toothed, rostrum large (usually articles 4-5 of pereopods 3-4 expanded) .......................................................... 18
— Primary and accessory flagellum basally articulated in male, maxilla 1 palp expanded apically, one mandible deeply toothed, rostrum small (articles 4-5 of pereopods 3-4 not expanded) .......................................................... 19
18. Pereopods 3-7 simple .................................................................................... Halicoides
— Pereopods 3-7 prehensile .............................................................................. Parahalice
19. Dactyl of gnathopods usually with 1+ serrations, upper lip lobes weakly asymmetrical, maxilliped outer plate narrow ...................................................... Pardalisceilla
— Dactyl of gnathopods lacking serrations, upper lip lobes strongly asymmetrical, maxilliped outer plate broad ...................................................... Pardalisceopa

Arculia J.L. Barnard


Type species. Arculia trago J.L. Barnard, 1961a, original designation.

Diagnosis. Rostrum well developed. Eyes absent. Ratio of peduncular articles on antenna 1 = 16:9:6, base of primary flagellum with callynophore, article 1 of flagellum much longer than peduncle, article 2 of peduncle short; accessory flagellum present. Mouthparts forming quadrate bundle below head. Upper lip rounded below. Mandibles scarcely asymmetrical, incisor on both smooth, palp article 3 minute. Inner lobes of lower lip coalesced, without raphus. Palp of maxilla 1 not apically expanded. Maxilla 2 well developed, plates subequal. Inner plates of maxilliped obsolescent, outer plates medium; palp about 1.5 times as long as medial edge of outer plate. Coxae 1-4 quadrate, diverse, broader than long, coxa 1 especially short. Gnathopod 1 simple, gnathopod 2 subchelate, slender, article 6 of both gnathopods about as long as article 5, only carpus of gnathopod 2 with broad, shallow lobe; gnathopod 2 weakly subchelate; dactyls normally claw-shaped, gnathopod 2 with 2 inner teeth. Pereopods simple. Urosomal tooth strong. Telson elongate, deeply cleft.

Relationship. The combination of short article 3 on the mandibular palp and presence of an accessory flagellum differentiate this genus from all others except Halice; from the latter it differs in the subchelate, albeit weak, gnathopod 2.
Differing from *Halicella* in the quadrate field of mouthparts (versus conical).

**Species.** *Arculfia trago* J.L. Barnard, 1961a (Karaman, 1974a) [715B].

**Habitat and distribution.** Marine, Tasman Sea, 610 m, 1 species.

*Caleidoscopsis* Karaman  
Figs 1031, 104F


**Type species.** *Pardaliscopsis copal* J.L. Barnard, 1967a, original designation.

**Diagnosis.** Rostrum small. Eyes absent. Ratio of peduncular articles on antenna 1 = 23:7:4, base of primary flagellum narrow, articulate, article 1 of flagellum scarcely longer than article 3 of peduncle, article 2 of peduncle short; accessory flagellum present. Mouthparts forming quadrate bundle below head. Principal flagella of antennae 1-2 unusually short. Upper lip scarcely and asymmetrically incised below. Mandibles asymmetrical, incisor on left weakly toothed, on right strongly toothed, palp fully developed. Inner lobes of lower lip coalesced. Palp of maxilla 1 expanded apically. Maxilla 2 well...
developed, plates weakly diverse. Inner plates of maxilliped small to obsolescent, outer plates medium; palp more than 2 times as long as medial edge of outer plate. Coxae 1-4 quadrate, alike, even, longer than broad. Gnathopods simple, slightly stout, article 6 of both gnathopods slightly longer than article 5, carpus not lobate; dactyls normally claw-shaped, without inner teeth. Pereopods simple. Urosomal teeth moderate. Telson elongate, deeply cleft.

**Variables.** *Caleidoscopsis tikal* differing from type in: labrum more deeply asymmetrical; right mandible deeply toothed; male antenna 1 with conjoint bases on both flagella.

**Relationship.** Differing from *Pardaliscopsis* and *Pardaliscella* in the longer coxae 1-4 and short, broad lobes of maxilla 2. From *Halice* and *Arculfa* 'n the strongly toothed right incisor, the short maxilla 2 and apically expanded palp of maxilla 1.

**Species.** See Karaman (1974a); *C. copal* (J.L. Barnard, 1967a) [309A]; *C. simplignathia* (J.L. Barnard, 1962d) [412A]; *C. tikal* (J.L. Barnard, 1967a) [309B].

**Habitat and distribution.** Marine, Pacific Mexico, Cedros Trench, 1720-2475 m; Atlantic Ocean, Angola Basin, 3015 m; 3 species.

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Eupereopus Mills
Figs 103E, 104J


Type species. Eupereopus abyssicola Mills, 1967c, monotypy.

Diagnosis. Rostrum absent. Eyes absent. Ratio of peduncular articles on male antenna 1 = 26:6:5, base of only male primary flagellum inflated with callynophore, article 1 of flagellum longer than article 3 of peduncle in male, article 2 of peduncle short; accessory flagellum present, base conjoint only in male. Mouthparts forming conical bundle below head. Upper lip weakly and asymmetrically incised. Mandibles [?asymmetrical, incisor on left unknown], on right moderately toothed, palp fully developed. Inner lobes of lower lip [? coalesced]. Palp of maxilla 1 not apexically expanded. Maxilla 2 well developed, plates equal. Inner plates of maxilliped obsolescent, outer plates large; palp about 1.5 times as long as medial edge of outer plate. Coxae 1-4 rectangular, alike, even, very broader than long. Gnathopods simple, stout, article 6 of both gnathopods much shorter and narrower than article 5, carpus not lobate; dactyls normally claw-shaped, with 2-3 inner teeth. Pereopods simple. Urosomal teeth strong. Telson elongate, deeply cleft.

Additional characters. Article 2 of mandibular palp especially stout; dactyls of pereopods 5-7 especially long.

Relationship. Differing from Pardaliscella in the short, unclawed telson and stout mandibular palp. From Parpano in the short propodus and long carpus of the gnathopods, thick mandibular palp and normal uropod 3.

Species. Eupereopus abyssicola Mills, 1967c (Karaman, 1974a) [307A].

Habitat and distribution. Marine, north-western Atlantic near Bermuda, 2500-4977 m, 1 species.

Halice Boeck
Fig. 103D


Type species. Halice abyssi Boeck, 1871b, selected by Boeck, 1876.

Diagnosis. Rostrum well developed. Eyes absent. Ratio of peduncular articles on antenna 1 = 23:10:7, base of primary flagellum inflated in male, narrow in female, callynophore in both sexes, article 1 of flagellum almost as long as peduncle, or longer, article 2 of peduncle short; accessory flagellum present. Mouthparts forming quadrate bundle below head. Upper lip weakly and asymmetrically incised. Mandibles symmetrical, incisor on left scarcely toothed, on right smooth, palp fully developed, but article 3 very short. Inner lobes of lower lip [? coalesced]. Palp of maxilla 1 not apically expanded. Maxilla 2 well developed, plates equal. Inner plates of maxilliped obsolescent, outer plates large; palp about 1.5 times as long as medial edge of outer plate. Coxae 1-4 quadrate, alike, even, broader than long. Gnathopods simple, slender, articles 5 and 6 of both gnathopods subequal in length, carpus not lobate; dactyls normally claw-shaped, without inner teeth. Pereopods simple. Urosomal teeth strong. Telson elongate, deeply cleft.

Additional characters. Well-developed lacinia mobilis usually present on both mandibles, large on left, small on right.

Sexual dimorphism. Base of both flagella of antenna 1 conjoint in both sexes but more exaggerated in male.

Variables. Head occasionally with protuberant forehead as in certain synoploids (H. macronyx); base of primary flagellum in female antenna 1 without callynophore (H. ulcisor); mandibular palp article 3 elongate, nearly as long as article 2 (H. shoemakeri, H. macronyx, H. secunda), about half as long as article 2 (H. quarta, H. tenella, H. subquarta, H. aculeata) or 75% (again H. tenella); palp of maxilla 1 apically expanded (H. quarta); coxae 1-5 longer than broad, coxa 5 tapering (H. cocalito), coxae 1-7 very diverse (H. macronyx); article 6 of gnathopod 1 much shorter and narrower than article 5, carpus not lobate; dactyls of pereopods 5-7 normally claw-shaped, without inner teeth. Pereopods simple. Urosomal teeth strong. Telson elongate, deeply cleft.

See Arculafia.

Habitat and distribution. Marine, cosmopolitan, largely bathyal-abyssal, cold water, probably mostly bathypelagic and epibenthic, minimum depths in vertical trawls poorly delineated, probably also hadal in trenches, deepest confirmed minimum depth probably 4200 m, often caught in tows less than 1000 m, also surface tows at night, 0-4200 (10,500) m, 14 species.

Habitat and distribution. Marine, Antarctic, Gauss station, 385 m, 1 species.

Halicoides Walker
Fig.104G


Habitat and distribution. Marine, Antarctica, Gauss station, 385 m, 1 species.

Type species. Halicoides anomalus Walker, 1896b, monotypy.

Diagnosis. Rostrum well developed. Eyes absent. Ratio of peduncular articles on antenna 1 = 13:5:4, base of primary flagellum inflated with callynophore in male only, article 1 of flagellum much longer than article 3 of peduncle. Article 2 of peduncle short; accessory flagellum present (aberrant in holotype of type species, see Thurston, 1976b). Mouthparts forming quadrate bundle below head. Upper lip rounded below. Mandibles symmetrical, incisors smooth, palp fully developed, article 3 about one third as long as 2. Inner lobes of lower lip coalesced, with raphus. Palp of maxilla 1 not expanded apically. Maxilla 2 well developed, plates equal. Inner plates of maxilliped small, outer plates medium; palp more than 1.5 times as long as medial edge of outer plate. Coxae 1-4 subquadrate, alike, even, broader than long. Gnathopods simple, slender, article 6 of gnathopod 1 much longer than article 5, equal on gnathopod 2, carpus not lobate; dactyls normally claw-shaped, without inner teeth. Pereopods simple. Urosomal teeth absent. Telson elongate, deeply cleft.

Additional characters. Urosomite 2 with long seta; apex of outer plate of maxilliped subtruncate, with 2 prominent spines disjunctly stouter than medial spines (versus more even spination size sweep around apex from medial margin).

Sexual dimorphism. Base of primary flagellum on male antenna 1 with callynophore, articulated in females.

Variables. Rostrum small (H. anacantha); upper lip strongly emarginate (H. lolo, H. walkeri); right lacinia mobilis broad (H. lolo), bifid (H. tertia), narrow and ragged (H. discoveryi); one mandible well toothed (H. anomalus), palp article 3 half as long as article 2 (H. walkeri); inner plate of maxilliped obsolescent (H. synopiae); coxae 3-4 enlarged (H. indica), coxa 5 enlarged (H. synopiae); gnathopod 1 very thin and almost without setae (H. indica), slightly more setose (H. indica, H. discoveryi, etc.); articles 4-5 of pereopods 3-4 only moderately expanded (H. anacantha, H. lolo, H. nana); articles 5-6 of pereopods 5 and article 4 of pereopods 6-7 longer than article 2 (H. anomalus), not so (H. anomalus).

Type species. *Necochea pardella* J.L. Barnard, 1962d, original designation.

**Diagnosis.** Rostrum well developed. Eyes absent. Ratio of peduncular articles on antenna 1 = 16:8:8, base of primary flagellum narrow, articulate, article 1 of flagellum shorter than article 3 of peduncle, article 2 of peduncle short; accessory flagellum present. Mouthparts forming quadrate bundle below head. Upper lip [*asymmetrically incised or rounded below*. Mandibles asymmetrical, incisor on left weakly toothed, on right strongly toothed, palp fully developed. Inner lobes of lower lip [*separate, coalesced*. Palp of maxilla 1 expanded apically. Maxilla 2 obsolescent. Inner plates of maxilliped obsolescent, outer plates medium to large; palp more than 1.5 times as long as medial edge of outer plate. Coxae 1-4 quadrate, alike, even, longer than broad. Gnathopods simple, stout, article 6 of both gnathopods 1-2 much shorter than swollen article 5, carpus not lobate; dactylus normally claw-shaped, with 3 inner setae. Pereopods simple. Urosomal teeth weak. Telson elongate, deeply cleft.

**Variable.** Article 2 of pereopods 5-7 with several long posterior setae (*N. unidentata*).

**Relationship.** Characterised by large, subchelate gnathopods with expanded propodus and carpus, strong urosomal teeth, and elongate deeply cleft telson.

**Species.** See Karaman (1974a); *N. tumida* Bruzelius, 1859 (Sars, 1895) (Enquist, 1950) (Gurjanova, 1951) (J.L. Barnard, 1959) (Ledoyer, 1973c) (Lincoln, 1979a) [200 + B]; *N. unidentata* K.H. Barnard, 1932 [872 + B].

**Habitat and distribution.** Marine, Arctic-boreal and Antarctic Palmer Archipelago, benthic, 35-1398 m, 1 species.
**Parahalice** Birstein & Vinogradov

*Fig. 103J*


**Type species.** *Parahalice mirabilis* Birstein & Vinogradov, 1962a, original designation.

**Diagnosis.** Rostrum well developed. Eyes present as pigment only. Ratio of peduncular articles on antenna 1 = 20:11:11, base of primary flagellum with callynophore, article 1 of flagellum much longer than peduncle, article 2 of peduncle short; accessory flagellum present, conjoint. Mouthparts forming [?]quadrate bundle below head. Upper lip [?grossly and asymmetrically incised]. Mandibles symmetrical, incisor on both sides smooth, palp absent. Inner lobes of lower lip [?separate. coalesced]. Palp of maxilla 1 expanded apically. Maxilla 2 poorly developed, plates equal. Inner plates of maxilliped obsolescent, outer plates medium; palp just as long as medial edge of outer plate. Coxa 1-4 quadrate-ovate, alike, even, broader than long. Gnathopods simple, slender, article 6 of both gnathopods much shorter and thinner than article 5; dactyls either stubby or claw-shaped, with many inner teeth. Pereopods simple. Urosomal teeth strong. Telson elongate, deeply cleft.

**Additional characters.** Outer plate of maxilla 1 with spines very thin and widely separated.

**Relationship.** Characterised by short partly cleft rostrum, thus differing from *Tosilus* in the ordinary uropod.

**Species.** *Parahalice mirabilis* Birstein & Vinogradov, 1962a, 1964 (Karaman, 1974a) [616?A].

**Habitat and distribution.** Marine, southern Indian Ocean near Rodriguez, tows of 0-2700, 0-3300 m, 1 species.

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**Pardalisca** Krøyer

*Figs 103C, 104B*


**Type species.** *Pardalisca cuspidata* Krøyer, 1842, monotypy.

**Diagnosis.** Rostrum small. Eyes present or absent. Ratio of peduncular articles on antenna 1 = 11:8:3 down to 11:5:3, base of primary flagellum in female narrow, articulate, in male callynophore present, article 1 of flagellum much longer than article 3 of peduncle in male, shorter in female, article 2 of peduncle short; accessory flagellum present. Mouthparts forming quadruate bundle below head. Upper lip grossly and asymmetrically incised below. Mandibles asymmetrical, incisor on left weakly toothed, on right strongly toothed, palp fully developed. Inner lobes of lower lip separate. Palp of maxilla 1 expanded apically. Maxilla 2 well developed, thin, plates equal. Inner plates of maxilliped small to obsolescent, outer plates large; palp just as long as medial edge of outer plate. Coxa 1-4 quadrate, alike, even, scarcely broader than long. Gnathopods simple, slender, but carpus stout, not lobate, article 6 of both gnathopods much shorter and thinner than article 5; dactyls either stubby or claw-shaped, with many inner teeth. Pereopods simple. Urosomal teeth weak, keel-like. Telson elongate, deeply cleft.

**Sexual dimorphism.** Base of primary flagellum with callynophore in male, accessory flagella fused in male.

**Variables.** Outer plate of maxilliped short, distally truncate (*P. magellanica*); dactyls of gnathopods either unguiform or short and swollen.

**Relationship.** The basic member of the subgroup characterised by dominant carpus and small propodus on the gnathopods.

Differing from *Pardaliscoidea* in the serrate dactyls of the gnathopods and short article 2 of antenna 1. From *Princaxelia* in the similar length of palp on maxilliped and length of medial edge on outer plate.

**Species.** See Karaman (1974a); Stephensen (1931a); *P. abyssi* Boeck, 1871b (= *P. cuspidata* identification of Buchholz, 1874) (Stebbing, 1888) (Sars, 1895) (Chevreux, 1935) (Gurjanova, 1951) [216 + B]; *P. abyssioides* K.H. Barnard, 1932 [872]; *P. australiensis* K.H. Barnard, 1931b, 1932 [633]; *P. brachydactyla* Bellan-Santini, 1984 [302A]; *P. cuspidata* Krøyer, 1842 (Sars, 1895) (Gurjanova, 1951) (Bushueva, 1977) [216 + B]; *P. magellanica* Schellenberg, 1931 [864]; *P. marionis* Stebbing, 1888, 1906 [799]; *P. mediterranea* Bellan-Santini, 1984 [302BA]; *P. tenuipes* Sars, 1895 (Stephensen, 1931a) (Gurjanova, 1951) (J.L. Barnard, 1962d) [200 + B]; species, J.L. Barnard, 1967a [309B]; species, Ledoyer, 1977 [348].

**Habitat and distribution.** Marine, cosmopolitan, warm and cold water, largely benthic, 30-1748 m, 9 species.

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**Pardaliscella** Sars

*Figs 103B, 104I*

Type species. *Pardalisca boeckii* Malm, 1871, monotypy.

**Diagnosis.** Rostrum small. Eyes absent. Ratio of peduncular articles on antenna 1 = 24:14:7, base of primary flagellum narrow, with weak callynophore, article 1 of flagellum longer than article 3 of peduncle; article 2 of peduncle short; accessory flagellum present. Mouthparts forming quadrate bundle below head. Upper lip even or asymmetrically incised. Mandibles asymmetrical, incisor on left smooth, weakly toothed, on right strongly toothed, palp fully developed. Inner lobes of lower lip coalesced. Palp of maxilla 1 apically expanded. Maxilla 2 well developed, thin, plates equal. Inner plates of maxilliped small, outer plates medium; palp about 1.5 times as long as medial edge of outer plate. Coxae 1-4 subquadrate, even, broader than long. Gnathopods simple, moderately stout, article 6 of both gnathopods about as long as 5, carpus not lobate; dactyl normally claw-shaped, with 1-2 inner teeth. Pereopods simple. Urosomal teeth absent. Telson scarcely elongate, partly cleft.

**Variables.** Article 3 of mandibular palp with inner setae (*P. symmectrica*); outer plate of maxilliped rather broad (*P. inermis*, possibly = *Pardalisca*); dactyls of gnathopods lacking tooth (*P. inermis*); urosomite 1 with weak tooth (*P. symmectrica*); telson cleft almost to base (*P. symmectrica*).

**Relationship.** A very plain genus lacking urosomal teeth, with unmodified antennae, basic weak gnathopods and long well-cleft telson. Differing from *Halicoides* in unmodified antennae, small rostrum, well-toothed right mandible and apically expanded palp of maxilla 1.

See *Pardalisca*.

**Taxonomy.** Anomaly. *P. symmectrica* is somewhat close to *Paradalide* and disjunct from *Pardalisca* in terms of shorter than normal telson and presence of weak urosomal tooth; however, lack of prehensility on percepods and presence of dactylar teeth on the gnathopods requires retention in *Pardalisca*.

**Removal.** *Urothoe simplignathia* J.L. Barnard, 1962d, to *Caleidocapitella*.

**Species.** See G.S. Karaman (1974a); *P. axeli* Stebbing, 1906 (Stephensen, 1926, 1928, 1929b) (validity improbable) [238]; *P. boeckii* (Malm, 1871) (Sars, 1895) (Stephensen, 1931a) (Karaman & Schiecke, 1973) [355 + B]; *P. inermis* Ledoyer, 1986 [618A]; *P. lavrovi* Gurjanova, 1934a, 1936b, 1951) [292]; *P. symmectrica* J.L. Barnard, 1959f, 1966a, 1971b [270 + B]; *P. yaquina* J.L. Barnard, 1971b [225B].

**Habitat and distribution.** Marine, Atlantic and eastern Pacific Oceans, cold water, 27-3015 m (?3716 m, = *P. inermis*), 6 species.

**Pardalisca** Chevreux

**Habitat and distribution.** Marine, Pacific and Mediterranean, deep cold water, 218-6180 m, 4 species.

**Pardaliscopsis** Chevreux

**Habitat and distribution.** Marine, Pacific, Atlantic and Mediterranean, deep cold water, 218-6180 m, 5 species.
Diagnosis. Rostrum small. Eyes absent. Ratio of peduncular articles on antenna 1 = 23:17:11, base of primary flagellum narrow, articulate, article 1 of flagellum shorter than article 3 of peduncle, article 2 of peduncle short; accessory flagellum present. Mouthparts forming quadrate bundle below head. Upper lip grossly and asymmetrically incised. Mandibles asymmetrical, incisor on left weakly toothed, on right strongly toothed, palp fully developed. Inner lobes of lower lip coalesced. Palp of maxilla quadrate bundle below head. Upper lip weakly and asymmetrically incised. Mandibles asymmetrical, incisor on left weakly toothed, on right strongly toothed, palp fully developed. Inner lobes of lower lip coalesced. Palp of maxilla 1 apically expanded. Maxilla 2 well developed, plates equal. Both plates of maxilliped ordinary; though outer plate broad, palp about as long as medial edge of outer plate. Coxae 1-4 quadrate, alike, even, broader than long. Gnathopods simple, medium-stout, article 6 of both gnathopods subequal to article 5, carpus not lobate; dactyls normally claw-shaped, without inner teeth. Peneopods simple. Urosomal teeth weak in male, absent in female. Telson short, entire.

Additional characters. Uropod 3 very small, armaments weak, outer ramus shortened.

Relationship. Differing from Pardalisca in the broader outer plate of the maxilliped, notched apices of the telsomic lobes, lack of any serrations on the dactyls of the gnathopods (but some Pardalisca species are weak in this regard), and the strongly asymmetrical lobes of the upper lip.

Species. Pardalisca teniapalpa Chevreux, 1911a, 1935 (Karaman, 1974a) [221A].

Habitat and distribution. Marine, north-eastern Atlantic, Gulf of Gascogne, 4380 m, 1 species.

Parpano J.L. Barnard
Fig.104H

Type species. Parpano cebus J.L. Barnard, 1964a, original designation.

Diagnosis. Rostrum absent. Eyes absent. Ratio of peduncular articles on antenna 1 = 8:6:3, base of primary flagellum with callynophore in male, narrow and articulate in female, article 1 of flagellum in female scarcely longer than article 3 of peduncle, almost as long as peduncle in male, article 2 of peduncle short; accessory flagellum present. Mouthparts forming quadrate bundle below head. Upper lip weakly and symmetrically incised. Mandibles asymmetrical, incisor on left weakly toothed, on right strongly toothed, palp fully developed. Inner lobes of lower lip coalesced. Palp of maxilla 1 expanded apically. Maxilla 2 well developed, plates equal. Inner plates of maxilliped small, outer plates large; palp more than 3 times as long as medial edge of outer plate. Coxae 1-4 quadrate, alike, even, longer than broad. Gnathopods simple, slender, article 6 of both gnathopods much longer than article 5, carpus with narrow, shallow lobe; dactyls normally claw-shaped, without inner teeth. Pereopods simple. Urosomal teeth strong in male, absent in female. Telson short, entire.

Additional characters. Uropod 3 very small, armaments weak, outer ramus shortened.

Relationship. Like Tosilus but telson unclift.


Habitat and distribution. Marine, Caribbean trenches, 2868-5451 m, 2 species.

Princaxelia Dahl
Fig.103H

Type species. Princaxelia stephenseni Dahl, 1959, original designation.

Diagnosis. Rostrum small. Eyes present. Ratio of peduncular articles on antenna 1 = 9:5:2, base of primary flagellum with callynophore in male, article 1 of flagellum much longer than article 3 of peduncle, article 2 of peduncle short; accessory flagellum present. Mouthparts forming quadrate bundle below head. Upper lip weakly and asymmetrically incised. Mandibles slightly asymmetrical, incisor on left almost smooth, on right weakly toothed, palp fully developed. Inner lobes of lower lip coalesced. Paal of maxilla 1 expanded apically. Maxilla 2 well developed, plates equal. Inner plates of maxilliped small, outer plates large; palp more than 3 times as long as medial edge of outer plate. Coxae 1-4 quadrate, alike, even, broader than long. Gnathopods simple, stout, article 6 of both gnathopods much shorter and narrower than article 5, carpus with broad, shallow lobe; dactyls normally claw-shaped, without inner teeth. Peneopods simple. Urosomal teeth strong. Telson elongate, deeply cleft.

Sexual dimorphism. Antenna 1, primary flagellum with callynophore, accessory flagella conjoint basally in male, articulate in female.

Relationship. Differing from Pardalisca in the elongate palp of the maxilliped, and lack of teeth on the dactyls of the gnathopods.

Species. See Karaman (1974a); P. abyssalis Dahl, 1959
Habitat and distribution. Marine, Atlantic-Pacific, deep water, especially trenches, 1505-8210 (8300) m, 3 species.

Rhynohalicella Karaman

Figs 103G, 104C

Type species. Halicella halona J.L. Barnard, 1971b, original designation.

Diagnosis. Rostrum well developed. Eyes absent. Ratio of peduncular articles on antenna 1 = 30:19:9, base of primary flagellum with callynophore, article 1 of flagellum much longer than article 3 of peduncle, article 2 of peduncle short; accessory flagellum present. Mouthparts forming conical bundle below head. Upper lip evenly incised. Mandibles symmetrical, incisors smooth, palp represented by tubercle with 2 setae. Lower lip coalesced. Palp of maxilla 1 not expanded apically. Maxilla 2 well developed, plates equal. Both plates of maxilliped ordinary; palp only as long as medial edge of outer plate. Coxae 1-4 softly subtriangular or trapezoidal, weaker than long. Gnathopods simple, stout, article 6 of gnathopod 1 much longer than article 5, carpus with broad, shallow lobe; dactyls normally claw-shaped, without inner teeth. Telson elongate, deeply cleft.

Additional characters. Outer plate of maxilla 1 with only 5 spines; dactyl of maxilliped bluntly clavate.

Relationship. Differing from Halicella in the vestigial palp of the mandible, and shorter palp on the maxilliped.

Species. Rhynohalicella halona J.L. Barnard, 1971b (Karaman, 1974a) [268].

Habitat and distribution. Marine, north-eastern Pacific, off Columbia River, 200 m, 1 species.

Spelaeonicippe Stock & Vermeulen


Type species. Spelaeonicippe provo Stock & Vermeulen, 1982, original designation.

Diagnosis. Rostrum absent. Eyes absent. Ratio of peduncular articles on antenna 1 = 17:14:5, base of primary flagellum narrow, articulate, article 1 of flagellum scarcely longer than article 3 of peduncle, article 2 of peduncle as long as article 1; accessory flagellum present. Mouthparts forming conical bundle below head. Upper lip rounded below. Mandibles symmetrical, incisors almost smooth, palp fully developed. Inner lobes of lower lip coalesced. Palp of maxilla 1 slightly expanded apically. Maxilla 2 well developed, plates equal. Both plates of maxilliped ordinary; palp more than 2.5 times as long as medial edge of outer plate. Coxae 1-4 quadrate, alike, even, broader than long. Gnathopods weakly subchelate, stout, article 6 of both gnathopods much longer than article 5, carpus with broad, shallow lobe; dactyls normally claw-shaped, without inner teeth. Pereopods simple. Urosomal teeth absent. Telson elongate, deeply cleft.

Additional characters. Cephalic lobes rounded, plates of maxilliped 'broad', outer spinose (versus setose), palp of maxilla 1 with inner spines (or apex bevelled) (all versus Nicippe).

Relationship. Differing from Nicippe in the blunt cephalic lobes, shorter antenna 1, basally articulate flagella on male antenna 1, lack of dorsal teeth on the urosome; and see 'Additional characters'. See Parpano.


Habitat and distribution. Marine, sea grottos in Canary Islands, Turks and Caicos Islands, 2 species.

Tosilus J.L. Barnard

Figs 103K, 104D, 123M


Type species. Tosilus arroyo J.L. Barnard, 1966a, original designation.

Diagnosis. Rostrum small. Eyes absent. Ratio of peduncular articles on antenna 1 = 28:18:10, base of primary flagellum narrow, articulate, article 1 of flagellum scarcely longer than article 3 of peduncle, article 2 of peduncle short; accessory flagellum present. Mouthparts forming conical bundle below head. Upper lip weakly and asymmetrically incised below. Mandibles asymmetrical, incisor on left weakly toothed, on right strongly toothed, palp fully developed. Inner lobes of
lower lip coalesced. Palp of maxilla 1 expanded apically. Maxilla 2 well developed, plates equal. Inner plates of maxilliped obsolescent, outer plates small; palp [more than 2 times as long as medial edge of outer plate]. Coxae 1-4 quadrate, alike, even, longer than broad. Gnathopods simple, slender, article 6 of both gnathopods much longer than very short article 5, carpus not lobate; dactyls normally claw-shaped, without teeth. Pereopods simple. Urosomites often more or less coalesced; pleon small and flexed below body; thorax often styliform; maxillae feeble. Gnathopods simple or basally into head; urosomites often more or less laminar or appearing weakly fleshy, ovate.

**Description.** Head often with broad, flat rostrum. Antennal flagella sparsely articulate. Mandibular rakers few or absent. Inner lobes of lower lip absent, fused into one small piece or otherwise weak. Inner plate of maxilla 1 vestigial, spines on outer plate usually 6 or fewer. Maxilla 2 poorly armed. Plates of maxilliped usually ordinary, palp robust, with 3-4 articles. Gnathopods like pereopods 3-4, article 3 elongate, propodus elongate, simple or rarely with prehensile adaptations. Article 2 of pereopod 5 expanded, of pereopod 6 expanded or not, of pereopod 7 usually much less expanded than on pereopod 5, occasionally very slender; article 4 of pereopods 5-7 expanded. Dorsal rugosity pattern usually with double transverse ridge or hump on pleonite 1, rugosity absent on pleonite 3 and urosomites. Peduncle of pleopod 1 usually unexpanded, that of pleopods 2-3 expanded and lobate medially, rami usually subequal on pleopods 1-2, variable on pleopod 3, inner of pleopod 3 often short or vestigial. Uropod 1 ordinary, uropod 2 occasionally with only 1 ramus (females); uropod 3 extremely small, hidden by telson or scarcely emergent, with or without small ramus. Brood plates broad, usually with curl-tipped setae.

**Relationship.** The Dexaminidae (Prophliantinae) have biramous third uropods, a cleft telson and often have a reduced flagellum on antenna 2.

The Plioplateidae are more apomorphic in their elongate flagella on the antennae, the long thin pleopods with thin peduncles and equal rami, the giant mandibular molar, well-developed inner lobes on the lower lip, thin palp of the maxilliped with elongate article 1, the subchelate gnathopods lacking giant setae and the cowl-like cleft telson.

The Ceinidae are even more advanced than either Phliantidae or Plioplateidae because the coxae are not splayed, the body and head are not depressed, and the body, coxae or antennae lack any complex cuspidation.

The Temnothelaptidae have depressed louse-like bodies.

The Eophliantidae and Colomastigidae have cylindroid bodies with small coxae and no ornamentation. The Kuriidae have fused urosomites.

The Pagetinidae have mandibular palps, vestigial inner plates of the maxilliped, and a conspicuous, 3-articulate uropod 3.

The Iphimediidae have normal biramous uropod 3 and a mandibular palp.

**Key 1 to Genera of Phliantidae**

1. Article 2 of pereopod 7 ovate .................................................................Iphiplateia
   — Article 2 of pereopod 7 quadrate ......................................................2

2. Article 2 of pereopod 6 quadrate .........................................................Paraphinotus (= Heteropklias)
   — Article 2 of pereopod 6 ovate ..........................................................3
3. Inner ramus of pleopod 3 greatly shortened ........................................4
   — Inner ramus of pleopod 3 about as long as outer ramus ................5
4. Pereopods simple, body very tall ......................................................Quasimodia
   — Pereopods prehensile, body very flat ............................................Gabophlias
5. Peduncles of all pleopods strongly produced medially, molar stubby, with nail .................................................................Iphinotus
   — Peduncle of pleopod 1 unproduced, of pleopod 2 weakly produced, of pleopod 3 strongly produced, molar spike-like .........................Pereionotus (=Palinnotus) (? = Phlias)

Key 2 to Genera of Phliantidae

1. Gnathopods and pereopods weakly prehensile ................................Gabophlias
   — Gnathopods and pereopods not prehensile ......................................2
2. Inner ramus of pleopod 3 subequal to outer ramus ................................3
   — Inner ramus of pleopod 3 half or less as long as outer ramus ...........5
3. Uropod 3 with ramus, (palp of maxilliped with 3, rarely 4, articles) ..............Iphinotus
   — Uropod 3 lacking ramus, (palp of maxilliped with 3 articles) ............4
4. Palp of maxilla 1 present, plates of maxilla 2 separate ...................Phlias (=Palinnotus)
   — Palp of maxilla 1 absent, plates of maxilla 2 coalesced ..................Phlias, Pereionotus
5. Inner ramus of pleopod 3 half as long as outer ramus ......................Pariphinotus (=Heterophlias)
   — Inner ramus of pleopod 3 vestigial ...............................................6
6. Uropod 3 with ramus .........................................................................Quasimodia
   — Uropod 3 lacking ramus ....................................................................Iphiplateia

Gabophlias J.L. Barnard
Fig.105C


Type species. Gabophlias olono J.L. Barnard, 1972b, original designation.


**Relationship.** Like *Quasimodia* in shortened inner ramus of pleopod 3 but unlike all other phliantids in the weakly prehensile gnathopods and pereopods.

**Species.** *Gabophlias olono* J.L. Barnard, 1972b [780].

**Habitat and distribution.** Marine, southern Australia, littoral, 1 species.

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Iphigeneia Thomson, 1882: 237 [homonym, Mollusca].
Iphinotus Stebbing, 1899c: 419 (new name).

Type species. *Iphinotus chiltoni* Stebbing, 1899c, monotypy.

**Diagnosis.** Maxilla 1 lacking palp. Palp of maxilliped 3 or 4-articulate (correction from earlier). Gnathopods and pereopods simple. Article 2 of pereopod 6 ovate, of 7 quadrate. All pleopodal peduncles expanded, inner ramus of pleopod 3 elongate. Uropod 3 with 1 very small ramus.

**Description.** Molar stylol cylindrioid, stubby, with nail. Plates of maxilla 2 separate. Coxae strongly splayed. Inner rami of all pleopods only slightly shorter than outer rami. Rami of uropods 1-2 extending equally. Pereonite 1 with low hump and weak nipple, pereonites 2-6 also with 1-2 nipples, pleonite 2 with hump.

**Variables.** Palp of maxilliped 3 or 4-articulate in same species.

**Relationship.** Differing from *Pereionotus* in the produced peduncle of pleopod 1.

**Species.** *Iphinotus typica* (Thomson, 1882) (= *I. chiltoni* Stebbing, 1899c) (Stephensen, 1927e) (J.L. Barnard, 1972b) [850].

**Habitat and distribution.** Marine, New Zealand, Auckland Islands, littoral, 1 species.

---

**Iphiplateia** Stebbing

*Fig. 106C*


Type species. *Iphiplateia whiteleggei* Stebbing, 1899c, monotypy.

**Diagnosis.** Maxilla 1 lacking palp. Palp of maxilliped 4-articulate. Gnathopods and pereopods simple. Article 2 of pereopod 6 quadrate, of pereopod 7 ovate. Posterior pleopodal peduncles expanded, inner ramus of pleopod 3 vestigial. Uropod 3 lacking ramus.


**Relationship.** Differing from other phliantids in the ovate article 2 of pereopod 7.

**Species.** *Iphiplateia orientalis* Tzvetkova, 1976 [391]; *I. whiteleggei* Stebbing, 1899c, 1910a (J.L. Barnard, 1981) (Ledoyer, 1984) [600].

**Habitat and distribution.** Marine, Pacific Ocean from cold Japan Sea to New South Wales, littoral, 2 species.

---

**Fig. 106. Phliantidae.** A, Heterophlias seclusus; B, Pereionotus testudo; C, Iphiplateia whiteleggei; D, Quasimodia capricornis; E, Iphinotus typicus; F, Pereionotus (Palinnotus) thomsoni.
**Pariphinotus** Kunkel
Figs 105A, 106A

*Pariphinotus* Kunkel, 1910: 19.
*Heterophlias* Shoemaker, 1933c: 250 (*Heterophlias seclusus* Shoemaker, 1933, monotypy).

Type species. *Pariphinotus tuckeri* Kunkel, 1910, monotypy.

**Diagnosis.** Maxilla 1 lacking palp. Palp of maxilliped 3-articulate. Gnathopods and pereopods simple. Article 2 of pereopods 6 ovate, of *Pereionotus* monotypy.

**Description.** Molar flagellate or spike-like. Plates of maxilla 2 separate or coalesced (*Palinnotus*). Coxae strongly splayed. Inner rami of pleopods 1-2 slightly shortened. Outer ramus of uropod 1 slightly shortened; rami of uropod 2 in male extending equally, outer ramus absent in female. Pereonites 1-7 and pleonites 1-2 with weak dorsal carina.

**Relationship.** Differing from *Iphiplateia* in the quadrate article 2 of pereopod 7 and then from all other phliantids in the quadrate article 2 of pereopod 6.

**Species.** *Pariphinotus escabrosus* (J.L. Barnard, 1962b, 1969a,b, 1979b) [370]; *P. galapagoanus* (J.L. Barnard, 1979b) [546]; *P. seclusus* (Shoemaker, 1933) [780]; *P. tuckeri* Kunkel, 1910, monotypy.

**Habitat and distribution.** Marine, pan-America, tropics and subtropics, 0-16 m, 5 species (probably 1 superspecies).

**Pereionotus** Bate & Westwood
Figs 105B,G, 106B,F

*Icriidium* Grube, 1864a: 209; 1864b: 75 (*Icriidium fuscum* Grube, 1864a,b, monotypy).

Type species. *Oniscus testudo* Montagu, 1808, monotypy.

**Diagnosis.** Maxilla 1 lacking palp (type) or palp spine-like. Palp of maxilliped 3-articulate. Gnathopods and pereopods simple. Article 2 of pereopod 6 ovate, of 7 quadrate. Posterior pleopodal peduncles expanded, inner ramus of pleopod 3 slightly shortened. Uropod 3 lacking ramus.

**Description.** Molar flagellate or spike-like. Plates of maxilla 2 separate or coalesced (*Palinnotus*). Coxae strongly splayed. Inner rami of pleopods 1-2 slightly shortened. Outer ramus of uropod 1 slightly shortened; rami of uropod 2 in male extending equally, outer ramus absent in female. Pereonites 1-7 and pleonites 1-2 with dorsal carina or humps.

**Sexual dimorphism.** Female lacking outer ramus of uropod 2.

**Variables.** *Palinnotus* distinguished from *Pereionotus* only in presence of palp on maxilla 1 and separate plates of maxilla 2; probably should be kept at subgeneric level. Maxilla 1 with flat conical palp (*P. alaniphlias*); outer plate of maxilliped very small (*P. holmesi*); coxa 7 fused to pereonite 7 (*alaniphlias*); shapes of pereopod 7 and dorsal body humps variable.

**Relationship.** Like *Iphiplateia* in the long inner ramus of pleopod 3 but in contrast to *Pariphinotus, Quasimodia* and *Iphiplateia*; differing from *Iphiplateia* in the presence of a ramus on uropod 3 and the unproduced peduncle of pleopod 1.

**Species.** *Pereionotus alaniphlias* (J.L. Barnard, 1970a) (Ledoyer, 1978b, 1979a, 1986) (Sasidharan, 1983b) [600]; *P. holmesi* (Gurjanova, 1938, 1951) (Tzvetkova, 1968) [391]; *P. japonicus* (Tzvetkova, 1968) [391]; *P. natalensis* (K.H. Barnard, 1940) (?Pillai, 1954) (Griffiths, 1974b,c) (Ledoyer, 1986) [745]; *P. testudo* (Montagu, 1808) (= *P. rissoanus* Bate, 1862) (= *P. fuscum* Grube, 1864a, 1864b, 1864d) (Chevreux & Fage, 1925) (Lincoln,1979a) [330 + 677]; *P. thomsoni* Stebbing, 1899c (J.L. Barnard, 1972b) [780]; species (= *P. testudo* identifications of Walker & Scott, 1903; Rabindranath, 1972b; Ledoyer, 1979b) [600]; species, Sarma & Rao, 1981 [662].

**Habitat and distribution.** Marine, cosmopolitan in low latitudes, largely tropical to warm temperate, 0-25 m, 6 species (perhaps 1 superspecies).

**Philias** Guerin


Type species. *Philias serratus* Guerin, 1836, monotypy.

**Diagnosis.** Poorly described and type locality uncertain: Maxilla 1 [unknown]. Palp of maxilliped 3-articulate. Gnathopods and pereopods simple. Posterior
posterior pleopodal peduncles [unknown], inner ramus of pleopod 3 ['?as long as outer]. Uropod 3 [unknown].


Remarks. Obscure genus resembling *Pereionotus* (= *Palinnotus*), possibly synonym senior to both; type locality vague, possibly collected in Australia and *P. serratus* possibly therefore senior synonym of *Palinnotus thomsoni*; discrepancies including poor dorsal carination, large article 2 of pereopod 7 and equally extending Falkland Islands and Australia.

Species. *Phlias serratus* Guerin, 1836 [unknown].

Habitat and distribution. Type locality between Falkland Islands and Australia.

Quasimodia Sheard, Figs 105E,H, 106D


Type species. *Quasimodia womersleyi* Sheard, 1936b, selected by J.L. Barnard, 1969c.

Diagnosis. Maxilla 1 lacking palp. Palp of maxilliped 4-articulate. Gnathopods and pereopods simple. Article 2 of pereopod 6 ovate, of 7 quadrate. Posterior pleopodal peduncles expanded, inner ramus of pleopod 3 very short. Uropod 3 with 1 ramus. Body tall (versus *Gabophlias*).


Sexual dimorphism. Male eyes slightly enlarged; apex of antenna 1 more strongly armed with aesthetascs; body less bulky and humps smaller; and see more minor attributes in J.L. Barnard (1972b).

Variables. Hump on pereonite 7 small (Q. *barnardi*), large (Q. *enna*); inner ramus of pleopod 3 vestigial and nonsetose (Q. *womersleyi*), small and setose (Q. *capricornis*); inner ramus of uropod 2 slightly shortened (Q. *barnardi*), very short (Q. *enna*); ramus of uropod 3 as long as peduncle (Q. *capricornis*).

Relationship. Like *Gabophlias* in the short inner ramus of pleopod 3 but pereopods and gnathopods not prehensile.

Species. *Quasimodia barnardi* Sheard, 1936b (J.L. Barnard, 1972b) [780]; *Q. capricornis* Sheard, 1936b [785]; *Q. enna* J.L. Barnard, 1972b [785]; *Q. womersleyi* Sheard, 1936b [785].

Habitat and distribution. Marine, southern Australia, littoral, 4 species.

PHOXOCEPHALIDAE Sars, 1895

Diagnosis. Rostrum like visor or absent, not cylindrical; ventral cephalic cheek weak or absent. Article 3 of antenna 1 short; article 4 of antenna 2 with facial spines (except *Joubinella*). When rostrum reduced or absent, facial spines occurring on article 4 of antenna 2 or articles 4-5 of pereopods 5-6.

Right incisor broad and 3+ toothed (generally only *Tipimeginae* more than 3-toothed); mandibular palp article 3 with only 0-2 sets of outer setae closely contiguous on opposite faces, never in serial ranks, apex bevelled, all other setae dominantly apical; molar, if triturative, of acutabularian (cup-shaped) form, otherwise spinose or simple. Inner plate of maxilla 1 never pointed, never with more than 2 fully median setae, other setae apical or absent.


Description. (See Inquilines). Head usually long and rostrate in fashion of visor or hood, occasionally reduced or almost absent but rostrum never cylindrical; or head rarely grotesque; antenna 1 usually enveloped basally by rostrum.

Accessory flagellum well developed or easily visible in context of occasional reduced antennae; antenna 1 generally of pontoporeiid form, antenna 2 generally more elongate with facial armaments organised into ranks, mostly spines, on article 4, no ventral ranks of glossy spines, article 3 being very short, article 1 occasionally with tooth (ensiform); all flagella short in females. Mouthparts basic, mandibular molar triturative or usually simple, when fully triturative usually of acutabularian (cup shaped rosette) form; occasionally with partially triturative (*Leongathus*) or special spinate form (*Tipimeginae*). Labium with inner lobes and strong mandibular extensions. Inner plate of maxilla 1 rarely with more than 4 setae (*Pontharpinia*), often with fewer or
none (especially Phoxocephalinae). Palp of maxilla 1 2-articulate or 1-articulate (Phoxocephalinae). Maxilla 2 unimportant. Plates of maxillipeds plesiomorphically well developed and setose but in Phoxocephalinae and Harpiniinae losing size and armaments; palp always well developed and 4-articulate. No baler lobes on mouthparts.

Coxae 1-4 evenly integrated and progressively enlarged, coxal gills 2-7, brood plates slender. Gnathopods variable. Pereopods 3-7 often fossorial, pereopods 3-4 often with enlarged and heavily armed articles 4-5, article 6 being very stiff, rod-like and armed with powerful spines or numerous setae, though occasionally ameliorated (harpiniins and brolgins). Pereopod 5 of haustorioid form, articles 4-5 conspicuously broadened in context and usually well spined in context, article 2 broad or thin (Harpiniinae); pereopod 6 like pereopod 5 but longer, occasionally flabellate but frequently more slender; pereopod 7 short, article 2 broadly expanded and plate-like, other articles forming stenopod.

Epimera ordinary, variable, occasionally with massive setal brushes. Uropods 1-2 usually powerful, peduncle of uropod 2 usually heavily spined, uropod 1 occasionally with inter-ramal spike or displaced giant apical spine medi ally or rarely laterally; setae rare (e.g. Hopiphoxus, Pseudharpinia). Uropod 3 usually of gammaroid dispariramous form with well-developed article 2 on outer ramus, inner ramus of female slightly to greatly reduced; occasionally uropod 3 reduced (see inquilinous taxa). Telson cleft, occasionally elongate, armament patterns sparse but definitive, each lobe of telson usually with dorsolateral pair of penicillate setules and at least one apical setule plus spine(s), often with supernumerary dorsolateral spines or setae. Body carinate rarely on urosomites 2 or 3.

Sexual dimorphism in males. Often pelagic, neritic or demersal. Many unknown. Often with pubescence medially or dorsally on antenna 1-2; often with calceoli on flagella or rarely peduncles; often with flagellum on antenna 2 proliferate and greatly elongate. Often losing many epimeral setae in maturations, thus keys best used in females.

Eyes often enlarged. Mouthparts rarely degenerate (Harpinia). Gnathopods rarely larger, more slender or less setose. Pleopods usually enlarged. Epimera usually larger or smoother. Urosome usually smaller and more rigidly formed in known pelagic males. Uropods often with more peduncular and fewer ramal spines, these often more rhombic. Uropod 3 usually much more setose, inner ramus fully elongate. Telson with rows of denticles, these often seen also on urosome.

Relationship. Similar to Gammaroids, Pontoporeoids and their allies but differing in one or more of following characters: (1) visor-like rostrum; (2) presence of facial spines on article 4 of antenna 2; (3) acetabularian kind of molar if triturative, otherwise reduced and spinose, never enlarged and grossly pubescent; (4) short article 3 of antenna 1; (5) subchelate gnathopod 1; (6) unpointed inner plate of maxilla 1 never with more than 2 medial setae; (7) never more than pair of setal groups closely contiguous on opposite faces of mandibular palp article 3; (8) deeply cleft telson. Several gammaroids or pontoporeoids may have characters 1, 2, 5 individually present but none has 5 or more simultaneously as do all phoxocephalids.

Easily distinct from Haustoriidae, Urohaustoriidae, Zobrachoidae and Phoxocephalopsidae in the characteristic pereopod 7; from the Platyschnopidae in the noncylindrical rostrum; from the Urothoidae in the weak cephalic cheek, short article 3 of antenna 1, small molar lacking gross pubescence and elongate peduncles of pleopods.

Remarks. Phoxocephalidae express general fossorial adaptations, with powerful antennae, rostra, legs, pleopods, uropods, these often armed heavily with thin spines and setae or sparsely with very heavy elements. Many, however, are so strangely adapted in these structures that they might be considered to be inquilinous (see below). Spination and powerful appendages in the deep sea become much reduced (exception, Palabriaphoxus), pereopods 5-6 becoming thin and poorly armed.

In the plesiomorphic state uropod 3 is of the dispariramous gammaroid form with well-developed article 2 on the outer ramus and tendency for the inner ramus to be severely reduced in females. The telson is never entire but often elongate in phoxocephalins and harpinins.

Presence of setae on rami of uropods 1 to 2 is a feature of mostly deep-sea or cold water southern taxa in Pseudharpinia, Heterophoxus and Hopiphoxus. Mouthparts are very steady, the main progression being loss of setae on maxillae and maxillipeds, and reduction of maxillipedal plates in the Phoxocephalinae and Harpiniinae, preadapting them especially to inquilinous modes and deep-sea habitats. However, minute details of molars, laciniae mobiles and palp humps are systematically valuable.

Inquilines. The incipient inquiline state of many phoxocephalids is found in the reduced head of Yammacoona, Koila and progressively through the 37 species of Birubius. The contrasting enlargement of the head by elongation or complex elaboration of rostral processes occurs in Limnoporeia, Uldanamia, Parajoubinella, Mandibulaphoxus and Leptophoxus. The antennae are reduced in Japara and Kondoleus. Flabellate articles occur in Yammacoona. Male antenna 1 of Elpeddo assumes a prototypical lysianassid state with large calyptophore on article 1 of the primary flagellum. Spines become very spheroid on the antennae of Kondoleus and male Yammacoona.

Maxillipedal 'poison' spouts occur in Kondoleus and article 3 of the palp is produced in Leptophoxus, Leptophoxoides and Yammacoona.

Thin poking gnathopods occur in Ganha and
effectively occur in the heavily chelate *Limnoporela* and *Uldamania*, while other chelate gnathopods occur in *Kondoleus*. Eusirid gnathopods are very prevalent in the pelagic *Joubinella* and in the benthic or occasionally demersal *Coxophoxus*, *Eusyrophoxus*, *Japara*, *Jerildaria*, *Kondoleus* and *Kotla*.

Pygidisation occurs frequently. Dozens of species lack full articulation between urosomites 1 and 2 but *Foxiphalus vigitegus* is an extreme case. The urosome has a dorsal hook in that species and in the genera *Kulgaphoxus*, *Microphoxus* and *Tickalerus*. The inner ramus of uropod 2 becomes fused in *Kotla*, where spheroid spines occur. These rhombic or jewel-like spines also occur frequently in *Rhepoxynius*. Uropod 3 is reduced, often severely in *Japara*, *Kondoleus*, *Kotla*, *Kulgaphoxus* and *Matong*.

The cuticle is strongly frictional or nonskid in *Kondoleus* and *Matong*. Epimeron 3 is unusually serrate in *Rikkarus*, perhaps in this family the mark of strange behaviour.

**Biogeography.** Dominantly Australian, with the diverse *Birubius* (37+) and 25 other genera (species 90+). New Zealand has many monotypes (9+ genera). The Magellan-Palmer area retains 7+ genera with *Metharpinia* and *Fuegiphoxus* being in an ancestral position to certain Australian or North American taxa. Renewed radiation occurs in North America, with *Rhepoxynius* (15) and *Foxiphalus* (7), the North Pacific having 10+ genera.

Deep-sea radiation is another feature, with nearly 50 species in seven genera not counting North Atlantic *Harpinia*. The North Atlantic is impoverished, with 4 genera but most of the species occurring in the emergent blind *Harpinia*. The latter is assumed to have followed a bathyal pathway from the deep austral and then emerged into open niches in the North Atlantic. The western Atlantic also has this genus and three others, largely from the east Pacific via the isthmian waterways of the Miocene.

There are few tropical taxa, mostly the three genera of Madagascar plus the Indo-Pacific *Mandibulophonoxus*. South Africa has three to four mostly monotypic genera.

The group clearly had a Gondwanan source but has been very hard pressed to escape into the Northern Hemisphere, though as fossorial ecotypes there has been significant descent into the deep seas.

**Terms**

Glabrous: the opposite is ‘setose’.

Ordinary: when used for pereopod 7 the opposite is ‘reduced’ as seen in *Tipimegus*; when used for uropod 3 the opposites are ‘enlarged’ or ‘reduced’.

Trichophoxin: referring to the shape of the propodus (article 6) of gnathopods 1-2 which occasionally has the shape of a goose-neck barnacle, with convex anterior margin and straight posterior margin.

**Keys**

Seven subfamilies of Phoxocephalidae have been described (Barnard & Drummond, 1978) as in the following keys.

**Key to Subfamilies of Phoxocephalidae**

(females only)

1. Article 2 of pereopod 5 of thin form, 3 times as long as broad (Fig. 11C) .......................................................... Harpiniinae, Key A
   — Article 2 of pereopod 5 of broad form (Fig. 11B) .......................................................... 2

2. Palp of maxilla 1 1-articulate .......................................................... Phoxocephalinae, Key B
   — Palp of maxilla 1 2-articulate .................................................................................. 3

3. Article 3 of pereopod 7 enlarged, larger than article 4, mandibular molar pseudotriturative, of form C (Fig. 107H) .................................................. Tipimeginae, Key C
   — Article 3 of pereopod 7 not enlarged, mandibular molar not pseudotriturative .................................................................................. 4
4. Mandibular molar semitriturative, of form B (Fig. 107C). Leongathinae, Key D
   — Mandibular molar not semitriturative

5. Article 2 of antenna 1 especially shortened
   — Article 2 of antenna 1 elongate

6. Mandibular molar triturative, of form A (Fig. 107B)
   — Mandibular molar not triturative

7. Mandibular molar of special form E (Fig. 107A) bearing 3 or fewer spines, usually with common base, article 2 of pereopod 5 not tapering distally, telson lacking supernumerary dorsal spination
   — Mandibular molar of form D (Fig. 107G) bearing articulate spines not all organised into common base, usually 4 or more widely spread spines, article 2 pereopod 5 tapering distally, telson usually bearing supernumerary dorsal spination

8. Gnathopods 1 or 2 or both enlarged
   — Gnathopods 1 and 2 both small

Key A (Harpiniinae)

1. Eyes present
   — Eyes absent

2. Antenna 2 strongly ensiform (and female Cocoharpinia) Heterophoxus
   — Antenna 2 not ensiform

3. Article 4 of pereopod 6 thick, dactyl of maxilliped very long, apical nail obsolescent
   — Article 4 of pereopod 6 thin, dactyl of maxilliped short, stubby, apical nail highly elongate

4. Mandibular molar triturative, propodus of gnathopods rectangular
   — Mandibular molar simple, spinose, propodus of gnathopods ovate

5. Female uropod 2 lacking ramal spines, outer ramus of uropod 1 short
   — Female uropod 2 with ramal spines, outer ramus of uropod 1 as long as inner (and male Cocoharpinia) Proharpinia

6. Flagellum of male antenna 2 short as in female, male antenna 1 brushy
   — Flagellum of male antenna 2 highly elongate and proliferate, male antenna 1 not brushy
4. Mandibular molar semitriturative, of form B (Fig. 107C) .............................................. Leongathinae, Key D
   — Mandibular molar not semitriturative ........................................................................ 5

5. Article 2 of antenna 1 especially shortened ...................................................................... 6
   — Article 2 of antenna 1 elongate ................................................................................... 8

6. Mandibular molar triturative, of form A (Fig. 107B) ...................................................... Pontharpininae, Key E and Joubinellinae, Key H
   — Mandibular molar not triturative ................................................................................ 7

7. Mandibular molar of special form E (Fig. 107A) bearing 3 or fewer spines — usually with common base, article 2 of pereopod 5 not tapering distally, telson lacking supernumerary dorsal spination Brolginae, Key F
   — Mandibular molar of form D (Fig. 107G) bearing articulate spines not all organised into common base, usually 4 or more widely spread spines, article 2 pereopod 5 tapering distally, telson usually bearing supernumerary dorsal spination Parharpininae, Key G

8. Gnathopods 1 or 2 or both enlarged Joubinellinae, Key H
   — Gnathopods 1 and 2 both small Birubiinae, Key I

Key A (Harpiniinae)

1. Eyes present ....................................................................................................................... 2
   — Eyes absent .................................................................................................................... 6

2. Antenna 2 strongly ensiform ......................................................(and female Cocomarpinia) Heterophoxus
   — Antenna 2 not ensiform .............................................................................................. 3

3. Article 4 of pereopod 6 thick, dactyl of maxilliped very long, apical nail obsolescent Basuto
   — Article 4 of pereopod 6 thin, dactyl of maxilliped short, stubby, apical nail highly elongate .................................................................................................................................

4. Mandibular molar triturative, propodus of gnathopods rectangular Coxophoxus
   — Mandibular molar simple, spinose, propodus of gnathopods ovate .................................. 5

5. Female uropod 2 lacking ramal spines, outer ramus of uropod 1 short Torridoharpinia
   — Female uropod 2 with ramal spines, outer ramus of uropod 1 as long as inner .........................................................(and male Cocomarpinia) Proharpinia

6. Flagellum of male antenna 2 short as in female, male antenna 1 brushy .................................. 7
   — Flagellum of male antenna 2 highly elongate and proliferate, male antenna 1 not brushy .................................................... 8
7. Male brushes of first antennae on article 1 and base of flagellum, of second antennae on article 3, article 5 lacking calceoli .......................................................... Harpinia

--- Male brushes of first antennae on article 3, not on base of flagellum or antenna 2, article 5 of antenna 2 with calceoli .......................................................... Feripharpinia

8. No rami on uropods 1-2 continuously spinose to apex, article 2 on outer ramus of uropod 3 elongate, antenna 2 scarcely or not ensiform .............................................. Harpinopsis

--- Some rami of uropods 1-2 with dorsal spines continuous to apex, article 2 on outer ramus of uropod 3 short, antenna 2 usually ensiform .............................................. 9

9. Pereopod 6 powerful, thick .......................................................... Palabriaphoxus

--- Pereopod 6 weak, slender .......................................................... Pseudoharpinia

Key B (Phoxocephalinae)

1. Article 3 of palp on maxilliped immensely produced (Fig. 111H) .......................................................................................................................... 2

--- Article 3 of palp on maxilliped unproduced or scarcely so .......................................................... 3

2. Mandibular molar triturative (Fig. 107B) .......................................................... Leptophoxoides

--- Mandibular molar not triturative .......................................................... Leptophoxus

3. Mandibular molar triturative (Fig. 107B) .......................................................... 4

--- Mandibular molar not triturative, bearing spines, or molar absent .......................................................... 9

4. Carpus of gnathopod 1 short and cryptic (Fig. 110F) .................................................. Cephalophoxus

--- Carpus of gnathopod 1 long and free (Fig. 110H) .......................................................... 5

5. Neither pair of gnathopods enlarged .............................................................................. 6

--- At least gnathopod 2 enlarged (Fig. 110H) .......................................................... 7

6. Rostrum obsolescent (Fig. 108E) article 6 of pereopod 7 puffy and poorly armed ......................... Synphoxus

--- Rostrum well developed, article 6 of pereopod 7 slender and well armed ....................... Phoxocephalus

7. Article 2 on outer ramus of uropod 3 short (Fig. 111J) .................................................. Jeriddaria

--- Article 2 on outer ramus of uropod 3 elongate (Fig. 111A) .................................................. 8

8. Propodus of gnathopod 2 much larger than propodus of gnathopod 1 ...................... Cephalophoxoides

--- Propodus of gnathopods 1-2 alike .............................................................................. Eusyrophoxus
9. Rami of uropod 3 reduced, shorter than peduncle, outer ramus lacking article 2 .......................................................... *Japara*

   — Rami of uropod 3 ordinary ............................................................... 10

10. Flagellum of female antenna 2 reduced to 1 article, rostrum obsolete, article 2 of antenna 1 slightly elongate and produced apically, maxilliped with basal spouts (Fig. 111I), uropods 1-2 with dorsal setae, inner ramus of uropod 2 reduced .......................................................... *Kondoleus*

   — Flagellum of female antenna 2 multiarticulate, rostrum present, article 2 of antenna 1 short (except *Mesophoxus*), unproduced, maxilliped lacking basal spouts, uropods 1-2 with normal rami and lacking dorsal setae except in *Hopiphoxus* ................................................................. 11

11. Gnathopods chelate equally and strongly (Fig. 110J) .......................................................... 12

   — Gnathopods subchelate, occasionally gnathopod 1 weakly parachelate .......................................................... 13

12. Carpus of gnathopod 2 highly elongate, dactyls of pereopods 3-4 vestigial (Fig. 108H) .................................................................................................................. *Uldanamia*

   — Carpus of gnathopod 2 not elongate, dactyls of pereopods 3-4 fully developed .................................................. *Limnoporeia*

13. Article 2 on outer ramus of uropod 3 vestigial  ................................................................................................ (and possibly *Mesophoxus*) *Metaphoxoides*

   — Article 2 on outer ramus of uropod 3 well developed .................................................................................. 14

14. Epimeron 3 grossly serrate, propodus of gnathopod 2 thin, sinuous, palm extremely oblique or transverse .......................................................... *Rikkarus*

   — Epimeron 3 of rounded classification, propodus of gnathopod 2 expanded, palm weakly to moderately oblique .......................................................... 15

15. Rami of uropods 1-2 dorsally setose near apices (Fig. 107H) .......................................................... *Hopiphoxus*

   — Rami of uropods 1-2 neither setose nor bearing dorsal armaments near apices .......................................................... 16

16. Article 5 of gnathopod 1 elongate .......................................................... 17

   — Article 5 of gnathopods short .......................................................................................................................... 19

17. Telson ordinary .......................................................... 18

   — Telson with supernumerary lateral or dorsal spines (Fig. 109M), (carpus of gnathopod 2 elongate) .......................................................... *Parajoubinella*

18. Carpus of gnathopod 2 short, cryptic, palms of gnathopods 1-2 oblique .......................................................... *Diogodias*

   — Carpus of gnathopod 2 elongate, free, palms of gnathopods 1-2 transverse .......................................................... *Ringaringa*

19. Dactyls of pereopods 3-4 stunted .................................................................................................................. *Vasco*

   — Dactyls of pereopods 3-4 elongate .................................................................................................................. 20
20. Carpus of gnathopod 1 short and cryptic, palms of gnathopods oblique ....................................................... Metaphoxus

-- Carpus of gnathopod 1 free, palms of gnathopods transverse to chelate ........................................ Parametaphoxus

Key C (Tipimeginae)

1. Uropods 1-2 with elongate setae on peduncles and rami, epimeron 3 with large posteroventral tooth ......................................................... Waitangi

-- Uropods 1-2 lacking elongate setae, epimeron 3 lacking large posteroventral tooth ....................................................... 2

2. Telson with lateral spines, urosome with lateral spines, inner ramus of uropod 1 with only 1 row of marginal spines ............................................................... Trichophoxus

-- Telson lacking lateral spines, urosome lacking lateral spines, inner ramus of uropod 1 with 2 rows of marginal spines ....................................................... 3

3. Epistome with large anterior tooth, pereopod 7 with gill, epimeron 3 with grossly developed facial row of spines ........................................ Booranus

-- Epistome lacking anterior tooth, pereopod 7 lacking gill, epimeron 3 lacking facial spine row ........................................ Tipimegus

Key D (Leongathinae)

1. Monotypic .......................................................................................................................... Leongathus

Key E (Pontharpiniinae)

1. Monotypic ........................................................................................................................ Urophoxus (= Pontharpinia)

Key F (Brolginae)

1. Article 2 of peduncle on antenna 1 elongate, mandible with 4 or more spines on molar (not fully typical of brolgins) ....................................................... Cunmurra

-- Article 2 of peduncle on antenna 1 shortened, mandible with 3 or fewer spines on molar ....................................................... 2

2. Apex of outer ramus on uropod 3 with 2-3 setae .................................................................. 3

-- Apex of outer ramus on uropod 3 with one seta .................................................................. 11

3. Rami of uropods 1-2 continuously spinose to apex ........................................................... Mandibulophoxus

-- Rami of uropods 1-2 not continuously spinose to apex ....................................................... 4
4. Uropod 1 lacking special apicominal spine on peduncle ...................................................... 5

5. Molar with even spines, epimeron 3 poorly setose ................................................................ 6

6. Article 4 of antenna 2 with 2+ strong spine rows, inner plate of maxilla 1 with 4 setae, epimeron 3 with 1+ long setae ......................................................................................................................................................... (Foxiphalus) and Eobrolgus

7. Gnathopod 2 enlarged ................................................................................................................. Fuegiphoxus

8. Gnathopods identical to each other, propodus thin (Fig. 110I) .................................................. Kuritus

9. Apical setae on outer ramus of uropod 3 longer than article 2, article 5 of gnathopod 2 cryptic ................................................................................................................................. Wildus, Waipirophoxus

10. Molar with 4+ spines (non-brolgin), article 4 of antenna 2 with more than 2 rows of spines, telson with supernumerary lateral spines ................................................................................. Parkarpinia, Phoxorgia

11. Most posterior spines on article 6 of pereopods 3-4 thin, gnathopods stout .............................................. Brolgus

12. All but 1 posterior spine on article 6 of pereopods 3-4 thick and short, gnathopods thin .................................................. Ganba

Key G (Parharpiniinae)

1. Displaced spine on peduncle of uropod 1 lateral ........................................................................... Protophoxus

2. Displaced spine on peduncle of uropod 1 medial ............................................................................. Eobrolgus
2. Ventral setae on article 2 of antenna 1 shifted apically (Fig.109A), epimera 1-2 poorly setose posteriorly, article 2 of pereopod 7 without ventral setae, telson lacking true dorsal spines .................................................................................................................... *Phoxorgia*

| Ventral setae on article 2 of antenna 1 in middle, epimera 1-2 well setose posteriorly, article 2 of pereopod 7 setose ventrally, telson with truly dorsal spines .................................................. *Parharpinia* |

**Key H (Joubinellinae)**

1. Gnathopods of highly eusirid, pelagic, and predatorial form (Fig.110E), gnathopod 1 usually much larger than gnathopod 2 but occasionally of equal size, antenna 2 extremely thin, lacking well-organised clusters of facial spines, flagellum in female reduced to 2-3 articles, mandibular molar strongly triturative ................................................................. *Joubinella*

| Gnathopods weakly eusirid, of nonpelagic and nonpredatorial form, gnathopod 2 usually much larger than gnathopod 1 but occasionally of equal size, antenna 2 stout to medium in thickness, bearing well-organised clusters of facial spines, flagellum in female exceeding 6 articles, mandibular molar not or weakly triturative ........................................................................... 2 |

2. Uropod 1 with 2 dorsal spines on peduncle half as large as rami ............................................................................. *Synphoxus*

| No spines on uropod 1 enlarged .............................................................................................. 3 |

3. Epimeron 3 reduced to fully rounded classification, lacking all but 2 fully developed setae (Fig.108A), [head normal, uropod 2 freely articulate, uropods 1-2 lacking accessory apical nails, no epimera with facial brushes of setae above lateral ridges, spines on uropod 2 normal, ventral setae on article 2 of antenna 1 set in middle] ............................................................................................................. *Cunmurra*

| Epimeron 3 with 5 or more fully developed setae ................................................................ 4 |

4. Article 4 of antenna 2 bearing only 2 rows of facial and apical spines, head with rostrum obsolete but broadly truncate from lateral view, inner ramus of uropod 2 freely articulate, ventral setae on article 2 of antenna 1 set proximally ................................................................................................................................. *Yammacoona*

| Article 4 of antenna 2 bearing 3 or more rows of facial and apical spines, head with very short rostrum but anterior margin from lateral view sinuous, inner ramus of uropod 2 partially to fully fused to peduncle, ventral setae on article 2 of antenna 1 set distally ................................................................... 5 |

5. Spines on uropod 2 conical, of normal dimensions, sharp, epimera 1-2 lacking large vertically set setal brushes ............................................................................................................. *Matong*

| Spines on uropod 2 of rounded, jewel-like form, blunt, epimera 1-2 bearing large vertically aligned setal brushes ............................................................................................................. *Kotla* |
Key I (Birubiinae)

1. Gnathopod 2 significantly larger than gnathopod 1 .................................................. *Cunmuerra*
   — Gnathopods 1-2 subequal in size ............................................................................... 2

2. Uropods 1-2 lacking accessory (besides normal apical nail)
   apical nails on inner rami .............................................................................................. 3
   — 1 or both uropods 1-2 bearing accessory apical nails on inner rami .................................................. 11

3. Dactyl of pereopod 5 vestigial ......................................................................................... *Yan*
   — Dactyl of pereopod 5 fully formed ............................................................................. 4

4. Article 2 of pereopod 5 tapering distally (Fig. 111B) ...................................................... 5
   — Article 2 of pereopod 5 not tapering distally ................................................................. 7

5. Rami of uropod 3 minute, not longer than peduncle (Fig. 111L), telson without lateral spines ................................................................................................................. *Mesophoxus*
   — Rami of uropod 3 ordinary, telson with lateral spines ...................................................... 6

6. Displaced spine on peduncle of uropod 1 medial ......................................................... *Parharpinia*
   — Displaced spine on peduncle of uropod 1 lateral ........................................................... *Protophoxus*

7. Epimeron 2 with well-developed posterior setation ........................................................................ 8
   — Epimeron 2 with only posterior setules ........................................................................... 9

8. Rostrum constricted (Fig. 108E) .................................................................................... *Foxiphalus, Eobrolgus*
   — Rostrum ordinary (Fig. 108F) .................................................................................... *Grandifoxus*

9. Antenna 2 ensiform (Fig. 109E) ...................................................................................... *Rhepoxynius*
   — Antenna 2 not ensiform (Fig. 109G) ............................................................................ 10

10. Article 4 of female antenna 2 with well-developed dorsal setation, urosomite 3 with dorsal hook ................................................................. *Tickalerus*
    — Article 4 of female antenna 2 not setose, urosomite 3 lacking dorsal hook ....................... *Birubius*

11. Peduncle of uropod 1 with displaced apicomedial spine (Fig. 110G) ........................................ 12
    — Peduncle of uropod 1 lacking displaced apicomedial spine ............................................. 13

12. Fully apical nails on rami of uropods 1-2 present (Fig. 110G), rostrum ordinary .......................................................... *Phoxorgia*
    — Fully apical nails on rami of uropods 1-2 absent, subapicals present, rostrum reduced .......................................................... *Metharpinia*

13. Urosomite 3 ordinary ........................................................................................................ *Birubius*
    — Urosomite 3 with dorsal hook ..................................................................................... 14
14. Uropod 3 ordinary .................................................................Microphoxus
   — Uropod 3 short, rami not longer than peduncle ......................15

15. Coxa 4 perfectly rectangular, ventral setae on article 2 of
    antenna 1 situated proximally .............................................Kulgaphoxus
   — Coxa 4 not rectangular, ventral setae on article 2 of
    antenna 1 situated in middle or farther out.........................Tickalerus

**Basuto** Barnard & Drummond

**Type species.** *Pontharpinia stimpsoni* Stebbing, 1908b, original designation.

**Diagnosis.** Rostrum unconstricted. Eyes present. Article 2 of antenna 1 short, ventral setae widely spread but confined apically. Article 1 of antenna 2 not ensiform, article 3 with many facial setae, facial spines on article 4 in 2 rows set apical, all spines thin, article 5 very short. Right mandibular incisor with 3 teeth, [right lacinia mobilis unknown]; molar not triturative, with 4+ splayed spines; palp hump huge, apex of palp article 3 oblique. Inner plate of maxilla 1 with 3 setae, palp 2-articulate. Maxillipeds outer plate small, apex of palp not protuberant, dactyl elongate, apical nail scarcely distinct.

Gnathopods dissimilar, gnathopod 2 strongly enlarged, article 5 of gnathopod 1 of ordinary length, of gnathopod 2 cryptic, palms oblique, propodus of gnathopod 1 ordinary, ovate-rectangular, of gnathopod 2 broadened, neither heavily setose anteriorly. Article 5 of pereopods 3-4 with postero-proximal setae, article 6 with thin armaments. Article 2 of pereopod 5 of narrow form, articles 4-5 of pereopods 5-6 medium to narrow; pereopod 7 ordinary, article 3 ordinary, dactyl ordinary.

Epimera 1-2 without long facial brushes or posterior setae, epimeron 3 of ordinary classification, bearing 3 or more long setae. Urosomite 3 without dorsal hook. Peduncle of uropod 1 without inter-ramal spike, with major displaced spine apicolaterally, some rami of uropods 1-2 continuously spinose to apex, with subapical spines or nails, inner ramus of uropod 1 with 1 row of marginal spines. Inner ramus of uropod 2 reduced. Uropod 3 ordinary, bearing article 2 on outer ramus, with 2 apical setae. Telson ordinary.

**Relationship.** Like *Mandibulophoxus* but article 2 of pereopod 5 narrow, article 3 of antenna 2 multisetose facially, uropod 2 small, gnathopod 2 more strongly enlarged.

**Species.** *Basuto latipes* (Griffiths, 1976b) [746]; *B. stimpsoni* (Stebbing, 1908b) (= *B. intermedia* Schellenberg, 1925a) (J.L. Barnard, 1957) (Griffiths, 1974a,b) (Ledoyer, 1986) [435].

**Habitat and distribution.** Marine, Senegal to Natal and Madagascar, 0-300 m, 2 species.

**Birubius** Barnard & Drummond

Figs 107G, 108D, 109N

**Type species.** *Birubius panamunus* Barnard & Drummond, 1976, original designation.

**Diagnosis.** Rostrum variable. Eyes present. Article 2 of antenna 1 elongate to medium, ventral setae widely spread. Article 1 of antenna 2 not or scarcely ensiform, article 3 with 2 facial setules, facial spines on article 4 in 2+ rows, all spines thick, article 5 ordinary. Right mandibular incisor with 3-4 teeth, right lacinia mobilis bifid or simple, often flabellate or absent, molar not triturative, with 4+ splayed spines; palp hump small to medium, apex of palp article 3 oblique. Inner plate of maxilla 1 with 3-4 setae, palp 2-articulate. Maxillipeds ordinary, apex of palp article 3 not strongly protuberant, dactyl elongate, apical nail distinctly.

Gnathopods ordinary, small, similar, article 5 of gnathopods 1-2 of ordinary length, or elongate, without usurid attachment and not cryptic, palms oblique, propodus ordinary to thin, ovate-rectangular, poorly setose anteriorly. Article 5 of pereopods 3-4 with postero-proximal setae, article 6 with thick armaments. Article 2 of pereopod 5 of broad form, articles 4-5 of pereopods 5-6 broad to narrow; pereopod 7 ordinary, article 3 ordinary, dactyl ordinary.

Epimera 1-2 without facial brushes or long posterior setae, epimeron 3 of ordinary classification, bearing 3 or more long setae. Urosomite 3 without dorsal hook. Peduncle of uropod 1 without inter-ramal spike, with major displaced spine, rami of uropods 1-2 occasionally continuously spinose to apex (thus with minute subapical spines or nails), inner ramus of uropod 1 with 1 row of marginal spines. Inner ramus of uropod 2 ordinary. Uropod 3 ordinary, bearing article 2 on outer ramus, with 2 apical setae. Telson ordinary.

**Relationship.** This is the basic member of the Birubinae to which all other group members are
compared in appropriate places. Therefore see Cumurrä, Eobrolgus, Foxiphalus, Grandiphoxus, Kulgaphoxus, Metharpinia, Mesophoxus, Microphoxus, Parharpinia, Phoxorgia, Protophoxus, Rhepoxynius, Tickalerus and Yan.


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**Fig. 107.** Phoxocephalidae. A, Brolgus tattersalli; B, Urophoxus (= Pontharpinia) pinguis; C, Leongathus nootoo; D, Koala battari; E, Yammacoona kunarella; F, Harpinia plumosa; G, Birubius species; H, Tipinegus thalerus; I, Leprophoxus falcatus.

![Diagrams of various species of Phoxocephalidae](image)

**Fig. 108. Phoxocephalidae.** A, Leptophoxus falcatus; B, Phoxocephalus holbolli; C, Tipimegus kalkro; D, Birubius mayamayi; E, Microphoxus minimus; F, Paraphoxus oculatus; G, Cephalophoxoides kalkro; H, Mandibulophoxus uncirostratus; I, Booranus weemus; J, Cunmuuru stickeoma; K, Leongathus nectar; L, Brolgus millinus; M, Matong matong; N, Cephalophoxoides bassi; O, Joubinella traditor; P, Brolgus tattersalli.
Habitat and distribution. Marine, Australia and Indonesia, sublittoral, 38 species.

Booranus Barnard & Drummond
Fig. 1081


Type species. Booranus weemus Barnard & Drummond, 1978, original designation.

Diagnosis. Rostrum constricted. Eyes present. Article 2 of antenna 1 of medium length, ventral setae widely spread. Article 1 of antenna 2 weakly ensiform, article 3 with numerous setae, facial spines on article 4 in 2+ rows, all spines thick, article 5 very short. Epistome massively produced. Right mandibular incisor with 4 teeth; right lacinia mobilis bifid; molar elongate, conical, then subtruncate, bearing 3-4 large special spines; palmar hump small, apex of palp article 3 oblique. Inner plate of maxilla 1 with 4-5 setae, palp 2-articulate. Maxillipeds ordinary, apex of palp article 3 not protuberant, dactyl elongate, epical nail absent.

Gnathopods ordinary, small, similar, article 5 of gnathopods 1-2 elongate, without eusirid attachment, palms transverse to chelate, propodus heavily setose anteriorly, trichophoxin in shape. Article 5 of pereopods 3-4 without posteroproximal setae, article 6 with thick armaments. Article 2 of pereopod 5 of broad form, articles 4-5 of pereopods 5-6 broad; pereopod 7 miniaturised, article 3 enlarged, dactyl ordinary. Coxal gill 7 present.

Fig. 109. Phoxocephalidae. A, Brodus millinus; B, Elpeddo kaikai; C, Tipinegus thalerus; D, Urophoxus (= Pontharpinia) pinguis; E, Heterophoxus oculatus; F, Brodus tattersalli; G, Wildus thambaroo; H, Leongathus noovoo; I, Tipinegus kangulu; J, Kondoleus tekei; K, Kotia battari; L, Metaphoxus yaranellus; M, Pontharpinia villosz; N, Birubius panamunus.
Epimera 1-2 with long posterior setae, epimeron 3 of ordinary classification, bearing 3 or more long setae. Urosomite 3 without dorsal hook. Peduncle of uropod 1 with inter-ramal spike, without major displaced spine, some rami of uropods 1-2 continuously spinose to apex, with subapical spines or nails, inner ramus of uropod 1 with 2 rows of marginal spines. Inner ramus of uropod 2 especially shortened. Uropod 3 ordinary, bearing article 2 on outer ramus, with 3 long apical setae. Telson ordinary.

Relationship. Note two phrases in italics, characters of special note added to this diagnosis alone. These two characters, the massive epistome and the presence of coxal gills 7 distinguish this genus from Tipimegus. Otherwise, in the Phoxocephalidae these two characters are not used and are omitted from other diagnoses.


Habitat and distribution. Marine, southern Australia, ?New Zealand, sublittoral, 4 species.

**Brolgus** Barnard & Drummond


**Type species.** *Paraphoxus tattersalli* J.L. Barnard, 1958, original designation.

Diagnosis. Rostrum unconstricted. Eyes present. Article 2 of antenna 1 short, ventral setae either widely spread or almost confined apically. Article 1 of antenna 2 not ensiform, article 3 with 1-2 facial setules, facial spines on article 4 in 2+ rows, some spines thick and some spines thin, article 5 very short. Right mandibular incisor with 3 teeth, right lacinia mobilis bifid, molar not triturative, with 3 basally fused spines; palpal hump small, apex of palp article 3 oblique. Inner plate of maxilla 1 with 0-2 setae, palp 2-articulate. Maxillipeds ordinary, apex of palp article 3 not strongly protuberant, dactyl elongate, apical nail distinct.

Gnathopods dissimilar, gnathopod 2 strongly to moderately to strongly elongated, article 5 of gnathopod 1 of ordinary length, of gnathopod 2 very short, cryptic, palms oblique, propodus of gnathopod 1 ordinary, thin, oval-rectangular, elongate, of gnathopod 2 broadened, both poorly setose anteriorly. Article 5 of pereopods 3-4 with postproximal setae, article 6 with thin and thick armaments. Article 2 of pereopod 5 of broad form, articles 4-5 of pereopods 5-6 narrow; pereopod 7 ordinary, article 3 ordinary, dactyl ordinary.

Epimera 1-2 without long posterior setae, epimeron 3 of rounded classification, bearing 3 or fewer long setae. Urosomite 3 without dorsal hook. Peduncle of uropod 1 without inter-ramal spike, with major displaced spine apicomally, rami of uropods 1-2 not continuously spinose to apex, without subapical spines or nails, inner ramus of uropod 1 with 1 row of marginal spines. Inner ramus of uropod 2 ordinary. Uropod 3 ordinary, bearing article 2 on outer ramus, with 1 apical seta. Telson ordinary.

Relationship. The basic brolgin, characterised by presence of only 3 or fewer spines on the mandibular molar. Therefore see Key F and especially Cunnmuura, Elpeddo, Ganba, Kurius, Paraphoxus, Waipirophoxus and Wildus.


Habitat and distribution. Marine, southern Australia, sublittoral, 5 species.

**Cephalophoxoides** Gurjanova

Fig.108G,N


**Type species.** *Phoxocephalus bassi* Stebbing, 1888, original designation.

Diagnosis. Rostrum unconstricted. Eyes present. Article 2 of antenna 1 short, ventral setae confined apically. Article 1 of antenna 2 not ensiform, article 3 with 2 facial setules, facial spines on article 4 in 2+ rows, all spines thick, article 5 short. Right mandibular incisor with 2-3 teeth, right lacinia mobilis bifid, flabellate, molar triturative; palpal hump small to medium, apex of palp article 3 oblique. Inner plate of maxilla 1 without setae, palp 1-articulate. Maxillipeds ordinary, apex of palp article 3 not strongly protuberant, dactyl elongate, apical nail distinct.

Gnathopods dissimilar, gnathopod 2 strongly enlarged, article 5 of gnathopod 1 of ordinary length, free, with weak eusirid attachment, of gnathopod 2 similar but cryptic, palms oblique or transverse to chelate, propodus of gnathopod 1 ordinary to thin, rectangular, often elongate, of gnathopod 2 broadened, both poorly setose anteriorly. Article 5 of pereopods 3-4 with postproximal setae, article 6 with thin armaments. Article 2 of pereopod 5 of broad form, but often tapering distally, articles 4-5 of pereopods 5-6 narrow; pereopod 7 ordinary, article 3 ordinary, dactyl ordinary.
Epimera 1-2 without long brushes or posterior setae, epimeron 3 ordinary or of 'rounded-glabrous' classification bearing 0-8 long setae. Urosomite 3 without dorsal hook. Peduncle of uropod 1 without interramal spike, without major displaced spine, rami of uropods 1-2 not continuously spinose to apex, without subapical spines or nails, inner rami of uropod 1 with 1 row of marginal spines. Inner rami of uropod 2 ordinary. Uropod 3 ordinary, rami longer than peduncle, bearing article 2 on outer rami, with 2 apical setae. Telson ordinary to long, with or without supernumerary lateral or dorsal setae.

Relationship. Like Phoxocephalus but gnathopods diverse, gnathopod 2 enlarged. The eyes of Phoxocephalus are reduced or abnormal. See Euryrophoxus.

Species. Cephalophoxoides bassi (Stebbing, 1883) (Barnard & Drummond, 1978) [784]; C. burleus (Barnard & Drummond, 1978) [781]; C. homilis (J.L. Barnard, 1960a) [370]; C. keppeli (Barnard & Drummond, 1978) [773N]; C. kerqueini (Stebbing, 1888) (J.L. Barnard, 1964b, 1967) (Bellan-Santini & Ledoyer, 1974) [851 to 370B]; C. kukathus (Barnard & Drummond, 1978) [780]; C. rupullus (Barnard & Drummond, 1978) [781]; C. turggeus (Barnard & Drummond, 1978) [782B].

Fig.110. Phoxocephalidae. A, Tipimegus thalerus; B, Phoxocephalus holbolli; C, Parmynia villosa; D, Cennura itickerus; E, Joubinella strelkovi; F, Broglus tattersalli; G, Urophoxus (= Pontharpinia) pinguis; H, Matong matong; I, Garha pellai; J, Limnoporeia maranowe.
Habitat and distribution. Marine, southern Australia: Kerguelen; to California, 0-2398 m, 8 species.

Cephalophoxus Gurjanova


Type species. Phoxocephalus regium K.H. Barnard, 1930, original designation.

Diagnosis. Rostrum weakly constricted. Eyes present. Article 2 of antenna 1 short, ventral setae almost confined apically. Article 1 of antenna 2 weakly ensiform, article 3 with [? 2 facial setules], facial spines on article 4 in 1 row plus special apical spine(s), spines thick, article 5 short. Right mandibular incisor with [? 3 4 teeth, right lacinia mobilis bifid, simple, flabellate, absent] molar triturative, palpal hump small, apex of palp article 3 oblique. Inner plate of maxilla 1 without setae, palp 1-articulate. Maxillipeds with inner plates partly fused, poorly armed, apex of palp article 3 not protuberant, dactyl elongate, apical nail not

Fig.111. Phoxocephalidae. A, Elpeddo kaikai; B, Phoxocephalus holbolli; C, Harpinia plumosa; D, Urophoxus (= Pontharpinia) pinguis; E, Brolgus tattersalli; F, Leptomphoxus falcatus; G, Gamba pellati; H, Yammacoona kunarella; I, Kondoleus tekin; J, Brolgus millinus; K, Kota batturi; L, Japara papporus; M, Tipimegus thalerus.
distinct.

Gnathopods enlarged, similar, but gnathopod 2 even more enlarged, article 5 of gnathopods 1-2 very short, with eusirid attachment, cryptic, palms oblique, propodus of gnathopods 1-2 elongate, slightly broadened, poorly setose anteriorly. Article 5 of pereopods 3-4 with postero proximal setae, article 6 with thick setae. Article 2 of pereopod 5 of broad form, weakly tapering distally, articles 4-5 of pereopods 5-6 narrow; pereopod 7 ordinary, article 3 ordinary, dactyl ordinary.

Only epimeron 2 with anterofacial setal brush; epimeron 3 of ordinary classification, with 3-5 weak posterior and 0-1 ventral setae. Urosomite 3 without more enlarged, article 5 of gnathopods 1-2 very short, free on gnathopod 1, cryptic on gnathopod 2, palms oblique, propodus thin to moderate, ovat rectangular, elongate, poorly setose anteriorly. Article 5 of pereopods 3-4 with postero proximal setae, article 6 with thin and thick armaments. Article 2 of pereopod 5 of narrow form, articles 4-5 of pereopods 5-6 narrow; pereopod 7 ordinary, article 3 enlarged, dactyl ordinary.

Epimeron 1-2 without brushes of setae, epimeron 3 of ordinary classification, lacking setae. Urosomite 3 without dorsal hook. Peduncle of uropod 1 without inter-ramal spike, without major displaced spine, rami of uropods 1-2 not continuously spinose to apex, inner ramus of uropod 1 with 1 row of marginal spines. Inner ramus of uropod 2 ordinary. Uropod 3 ordinary, rami longer than peduncle, bearing article 2 on outer ramus, with 2 apical setae. Telson ordinary, with supernumerary lateral spine on each side.

**Remarks.** The only good drawing of mandible, by Hurley (1954a), is not certainly the right (though it looks to be) and therefore the queries in the description are not answered.

**Relationship.** Differing from *Phoxocephalus* in the cryptic carpus of both pairs of gnathopods; from *Cephalophoxoides* and *Parametaphoxus* by the cryptic carpus of gnathopod 1 (in the other two genera only gnathopod 2 has a cryptic carpus).

**Species.** *Cephalophoxus regium* (K.H. Barnard, 1930) (Hurley, 1954a), (Gurjanova, 1977) [775].

**Habitat and distribution.** Marine, New Zealand and Snares Islands, neritic to 91 m, 1 species.

*Cocoharpinia* Karaman


**Type species.** *Cocoharpinia iliffei* Karaman, 1980c, original designation.

**Diagnosis.** Rostrum unconstricted. Eyes present. Article 2 of antenna 1 short, ventral setae confined apically, article 3 in male densely brushy, not so in female. Article 1 of antenna 2 scarcely ensiform, article 3 with 2 facial setules, facial spine-setae on article 4 in 1 apical row, all spines thin, article 5 ordinary. Mouthparts in male reduced. Right mandibular incisor in female with [73] teeth, right lacinia mobilis [?bifid], molar conical, not triturative, with 2 spines; palpal hump moderate, apex of palp article 3 oblique. Inner plate of maxilla 1 with 2 setae, palp 2-articulate. Maxillipeds ordinary, apex of palp article 3 not protuberant, dactyl stubby; apical nail elongate.

Gnathopods ordinary, small, weakly dissimilar, gnathopod 2 moderately enlarged, article 5 of gnathopods 1-2 very short, free on gnathopod 1, cryptic on gnathopod 2, palms oblique, propodus thin to moderate, ovat rectangular, elongate, poorly setose anteriorly. Article 5 of pereopods 3-4 with postero proximal setae, article 6 with thin and thick armaments. Article 2 of pereopod 5 of narrow form, articles 4-5 of pereopods 5-6 narrow; pereopod 7 ordinary, article 3 enlarged, dactyl ordinary.

Epimeron 1-2 without brushes of setae, epimeron 3 of ordinary classification, lacking setae. Urosomite 3 without dorsal hook. Peduncle of uropod 1 without inter-ramal spike, with major displaced spine apicolaterally, rami of uropods 1-2 not continuously spinose to apex, without subapical spines or nails, inner ramus of uropod 1 with 1 row of marginal spines. Inner ramus of uropod 2 ordinary. Uropod 3 ordinary, rami longer than peduncle, bearing long article 2 on outer ramus, with 2 apical setae. Telson ordinary.

**Relationship.** Male and female antenna 2 and pereopod 7 are so distinctive the 2 sexes may not be in the same genus.

Female not distinct from *Heterophoxus* but male lacking well-developed ensiform process on antenna 2 and therefore close to theoretical male of *Proharpinia*. Male characterised by dense aesthetascs on article 3 of antenna 1.

**Species.** *Cocoharpinia iliffei* Karaman, 1980c [367Z].

**Habitat and distribution.** Marine, Bermuda, sea cave, 1 species.

*Coxophoxus* J.L. Barnard


**Type species.** *Coxophoxus hidalgio* J.L. Barnard, 1966a, original designation.

**Diagnosis.** Rostrum unconstricted. Eyes present. Article 2 of antenna 1 short, ventral setae confined apically. [*?Article 1 of antenna 2 not ensiform, article 3 with 2 facial setules], facial spines on article 4 in 1 main row, spines thin, article 5 short. Right mandibular incisor with [73 4 teeth, right lacinia mobilis unknown] molar triturative, large to medium; palpal hump small, apex of palp article 3 truncate. Inner plate of maxilla 1 naked, palp 1-articulate. Maxillipeds ordinary, apex of palp article 3 not strongly protuberant, dactyl elongate, apical nail distinct.

Gnathopods weakly dissimilar, large, gnathopod 1 weakly enlarged, 2 more so, article 5 of gnathopods 1-
2 elongate, with cusirid attachment, palms oblique to transverse, propodus broadened, poorly setose anteriorly. Article 5 of pereopods 3-4 with few posteroproximal setae, article 6 with thin armaments. Article 2 of pereopod 5 of narrow form, articles 4-5 of pereopods 5-6 narrow; pereopod 7 ordinary, article 3 ordinary, dactyl ordinary.

Epimera 1-2 without long posterior setae, epimeron 3 of ordinary classification, bearing 3 or more long setae. Urosomite 3 without dorsal hook. Peduncle of uropod 1 without inter-ramal spike, without major displaced spine, rami of uropods 1-2 not continuously spinose to apex, without subapical spines or nails, inner ramus of uropod 1 with 1 row of marginal spines, inner ramus of both pairs of uropods with setae (instead of spines, = unusual). Inner ramus of uropod 2 ordinary. Uropod 3 ordinary, bearing article 2 on outer ramus, with 2-3 apical setae. Telson ordinary.

Related species. Coxophoxus coxalis (K.H. Barnard, 1932) (Gurjanova, 1977) [833]; C. hidalgo J.L. Barnard, 1966a [310B].

Habitat and distribution. Marine, South Georgia and southern California, 0-1675 m, 2 species.

Cunmurra Barnard & Drummond Figs 108J, 110D


Type species. Cunmurra itickerus Barnard & Drummond, 1978, original designation.

Diagnosis. Rostrum unconstricted. Eyes present. Article 2 of antenna 1 short, ventral setae confined apically. Article 1 of antenna 2 not ensiform, article 3 with 2 facial setules, facial spines on article 4 in 2+ rows, all spines thick, article 5 ordinary. Right mandibular incisor with 3 teeth, right lacinia mobilis bifid, molar not triturative, with 4+ splayed spines; palparm hump medium, apex of palp article 3 oblique. Inner plate of maxilla 1 with 4 setae, palp 2-articulate. Maxillipeds ordinary, apex of palp article 3 not strongly protuberant, dactyl elongate, apical nail distinct.

Gnathopods slightly dissimilar, gnathopod 2 weakly enlarged, article 5 of gnathopod 1 elongate, of gnathopod 2 shorter, palms oblique, propodus of gnathopod 1 thin, rectangular, elongate, of gnathopod 2 broadened, both poorly setose anteriorly. Article 5 of pereopods 3-4 with posteroproximal setae, article 6 with thick armaments. Article 2 of pereopod 5 of broad form, articles 4-5 of pereopods 5-6 broad to medium; pereopod 7 ordinary, article 3 ordinary, dactyl ordinary.

Epimera 1-2 without long posterior setae, epimeron 3 of rounded classification, bearing 3 or fewer long setae. Urosomite 3 without dorsal hook. Peduncle of uropod 1 without inter-ramal spike, without major displaced spine, rami of uropods 1-2 not continuously spinose to apex, without subapical spines or nails, inner ramus of uropod 1 with 1 row of marginal spines. Inner ramus of uropod 2 ordinary. Uropod 3 ordinary, bearing article 2 on outer ramus, with 2 apical setae. Telson ordinary.

Relationship. This is a transitional genus between the broglin group and the birubiin group. Unlike broglins it has more than 3 spines on the molar but unlike the birubiin group it retains the weakly enlarged gnathopod 2. Epimeron 3, with its 3 or fewer long setae, is of the 'rounded' and/or 'glabrous' condition typical of most broglins. The carpus of gnathopod 2 is not fully shortened as in apomorphic broglins. Maxilla 1 has the full setal complement of birubins, the normal antenna 2 and stout distal articles of pereopods 5-6.

Species. Cunmurra itickerus Barnard & Drummond, 1978 [785].

Habitat and distribution. Marine, South Australia, sublittoral, 1 species.

Diogodias Barnard & Drummond


Type species. Metaphoxus longicarpus Ledoyer, 1973a, original designation.

Diagnosis. Rostrum unconstricted. Eyes present. Article 2 of antenna 1 short, ventral setae confined apically. Article 1 of antenna 2 not ensiform, article 3 with 2 facial setules, facial spines on article 4 in 2+ rows, all spines thick, article 5 ordinary. [Right mandibular incisor with 3 teeth, right lacinia mobilis flabellate], molar absent; palparm hump medium, apex of palp article 3 oblique. Inner plate of maxilla 1 without setae, palp 1-articulate. Maxillipeds inner plates partly fused, apex of palp article 3 not protuberant, dactyl elongate, apical nail distinct.

Gnathopods dissimilar, gnathopod 2 moderately to strongly enlarged, article 5 of gnathopod 1 elongate, of gnathopod 2 cryptic, palms oblique, propodus of gnathopods 1-2 slightly elongate or broadened, respectively, poorly setose anteriorly. Article 5 of pereopods 3-4 with posteroproximal setae, article 6 with thin and thick armaments. Article 2 of pereopod 5
of broad form, articles 4-5 of pereopods 5-6 medium to narrow; pereopod 7 ordinary, article 3 ordinary, dactyl ordinary.

Epimeron 1-2 without long posterior setae, epimeron 3 of rounded-glabrous classification, bearing 3 or fewer long setae. Urosomite 3 without dorsal hook. Peduncle of uropod 1 without interramal spike, without major displaced spine, rami of uropods 1-2 not continuously spinose to apex, without subapical spines or nails, inner rami of uropod 1 with 1 row of marginal spines. Inner rami of uropod 2 ordinary. Uropod 3 ordinary, bearing article 2 on outer ramus, with 0-2 apical setae. Telson ordinary to elongate.

Relationship. Like *Metaphoxus* and *Vasco* but carpus of gnathopod 1 elongate. See *Parajoubinella* and *Ringaringa*.

Removal. See *Ringaringa*.

Species. *Diogodias longicarpus* (Ledoyer, 1973a; Drury, 1986) [698]; *D. platyrostris* (Ledoyer, 1973a, 1986) [698].

Habitat and distribution. Marine, Madagascar, 2-20 m, 2 species.

*Elpeddo* Barnard & Drummond

Figs 109B, 111A

*Elpeddo* Barnard & Drummond, 1978; 118.

Type species. *Elpeddo kaikai* Barnard & Drummond, 1978, original designation.

Diagnosis. Rostrum unconstricted. Eyes absent. Article 2 of antenna 1 short, ventral setae confined apically. *Male antenna 1, primary flagellum with callynophorae*. Article 1 of antenna 2 not ensiform, article 3 with 2 facial setae, facial spines on article 4 in 1 row, all spines thick, article 5 ordinary. Right mandibular incisor with 3 teeth, right lacinia mobilis bifid, flabellate, molar not triturative, with 3 basally fused spines; palpal hump small, apex of palp article 3 oblique. Inner plate of maxilla 1 with 3 setae, palp 2-articulate. Maxillipeds ordinary, apex of palp article 3 not strongly protuberant, dactyl elongate, apical nail distinct.

Gnathopods ordinary, small, similar, but gnathopod 2 weakly enlarged, article 5 of gnathopods 1-2 of ordinary length, free, without eusirid attachment, palps oblique, propodus ordinary, ovatorectangular, poorly setose anteriorly. Article 5 of pereopods 3-4 with postero-proximal setae, article 6 with thick armaments. Article 2 of pereopod 5 of broad form, but weakly tapering distally, articles 4-5 of pereopods 5-6 medium to narrow; pereopod 7 ordinary, article 3 ordinary, dactyl ordinary.

Epimeron 1-2 without long posterior setae, epimeron 3 of rounded-glabrous classification, bearing 3 or fewer long setae. Urosomite 3 without dorsal hook. Peduncle of uropod 1 without inter-ramal spike, with major displaced spine apicommedially, rami of uropods 1-2 not continuously spinose to apex, without subapical spines or nails, inner rami of uropod 1 with 1 row of marginal spines. Inner rami of uropod 2 ordinary. Uropod 3 ordinary, bearing article 2 on outer ramus, with 2 short apical setae. Telson ordinary.

Relationship. Like *Broglus* and *Ganha* but article 2 on outer ramus of uropod 3 with 2 apical setae. Differing from *Kuritus* in the ordinary (thus short) article 5 of gnathopod 2. Closest to *Wildus* but differing in the fully split (ordinary) inner plates of the maxillipeds, shortness of setae on article 2 of outer ramus on uropod 3, and the odd lysianassid antenna 1 of the male.

Differing from its more primitive relative, *Fuegoiphoxus*, in the loss of 2 setae on the inner plate of maxilla 1, loss of main spine on the inner plates of the maxillipeds, but with the development of displaced spine on uropod 1, neotenic elongate form of article 2 on outer ramus of uropod 3 and the presence of giant calcceoli on article 5 of male antenna 2.


Habitat and distribution. Marine, New South Wales, sublittoral, 1 species.

*Eobrolgus* J.L. Barnard


Type species. *Paraphoxus spinosus* Holmes, 1905, original designation.

Diagnosis. Rostrum unconstricted. Eyes present. Article 2 of antenna 1 short to medium, ventral setae confined apically. *Male antenna 1, primary flagellum with callynophorae*. Article 1 of antenna 2 not ensiform, article 3 with 2 facial setae, facial spines on article 4 in 2+ rows, all spines thick, article 5 ordinary. Right mandibular incisor with 3 teeth, right lacinia mobilis bifid or simple, thin, molar not triturative, with 4+ splayed spines, pillow-shaped, palpal hump medium, apex of palp article 3 oblique. Inner plate of maxilla 1 with 4 setae, palp 2-articulate. Maxillipeds ordinary, apex of palp article 3 not strongly protuberant, dactyl elongate, apical nail obsolescent to absent.

Gnathopods ordinary, small, similar, article 5 of gnathopod 1 of ordinary length, of 2 very short, cryptic, palps oblique, propodus of gnathopods 1-2 ovatorectangular, poorly setose anteriorly. Article 5 of pereopods 3-4 with postero-proximal armament, article 6 with thick armaments. Article 2 of pereopod 5 of broad form, articles 4-5 of pereopods 5-6 broad and
narrow respectively; pereopod 7 ordinary, article 3 ordinary, dactyl ordinary.

Epiphrina 1-2 without long facial brushes or posterior setae, epiphrinae 3 of ordinary classification, bearing 1 or more long setae. Urosomite 3 without dorsal hook. Peduncle of uropod 1 without inter-ramal spike, without major displaced spine, rami of uropods 1-2 not continuously spinose to apex, without subapical spines, inner ramus of uropod 1 with 1 row of marginal spines. Inner ramus of uropod 2 ordinary. Uropod 3 ordinary, rami longer than peduncle, bearing article 2 on outer ramus, with 2 apical setae. Telson ordinary.

**Relationship.** Closely similar to *Paraphoxus* but bearing more than 3 spines on mandibular molar, 2 or more strong rows of thick facial spines on article 4 of antenna 2, the presence of more than 2 setae on the inner plate of maxilla 1 and the presence of one or more long setae on epimeron 3.

Like *Foxiphalus* but setae on article 2 of antenna 1 extending apically at least in female.

**Species.** *Eobrolgus chumashi* Barnard & Barnard, 1981, 1982 (370); *E. pontariopoides* (Gurjanova, 1953) [280]; *E. spinosus* (Holmes, 1905) (Barnard & Barnard, 1981, 1982a) [364 + 379T].

**Habitat and distribution.** Marine, North Pacific and north-western Atlantic, cool water, 2-519 m, 3 species.

*Eusyrophoxus* Gurjanova


**Type species.** *Phoxocephalus tenuipes* Stephensen, 1925, original designation.


Gnathopods medium to large, similar, article 5 of gnathopods 1-2 of ordinary length, wide, and cryptic respectively, with eusirid attachment, palms transverse, propodus broadened, poorly setose anteriorly. Article 5 of pereopods 3-4 without posteroproximal setae, article 6 with thin or no armaments. Article 2 of pereopod 5 of broad form, but tapering distally, articles 4-5 of pereopods 5-6 narrow; pereopod 7 ordinary, article 3 ordinary, dactyl ordinary.

Epiphrina 1-2 without long facial brushes or posterior setae, epiphrinae 3 of ordinary classification, bearing 1 or more long setae. Urosomite 3 without dorsal hook.
Peduncle of uropod 1 without inter-ramal spike, without major displaced spine, rami of uropods 1-2 not continuously spinose to apex, without subapical spines, inner ramus of uropod 1 with 1 row of marginal spines. Inner ramus of uropod 2 ordinary. Uropod 3 ordinary, bearing article 2 on outer ramus, with 2 apical setae. Telson ordinary.

**Variables.** Coxae 1-2 with posteroventral tooth (like *Grandifoxus*).

**Relationship.** Characterised by the enlarged spine on the mandibular molars which distinguishes it especially from *Cunnumura* and *Paraphoxus*; also differing from *Paraphoxus* in the strongly setose epimeron 3 and fully developed 4 setae on the inner plate of maxilla 1. From *Parharpinia* and *Protophoxus* in the lack of a displaced spine on uropod 1 and the enlarged spine on the mandibular molar.

See *Mesophoxus*.

**Species.** *Eyakia calcarata* (Gurjanova, 1938b, 1951) (J.L. Barnard, 1960a) [320 + 540 + B]; *E. ochotica* (Gurjanova, 1953) [284]; *E. robusta* (Holmes, 1908) (J.L. Barnard, 1960a) [379 + B]; *E. subuncigera* (Kudrjaschov, 1965c) [279]; *E. uncicigera* (Gurjanova, 1938b, 1951) [389].

**Habitat and distribution.** Marine, cold North Pacific, 4-689 m, 5 species.

*Feriharpinia* Barnard & Karaman


**Type species.** *Harpinia ferentaria* Gurjanova, 1977, original designation.

**Diagnosis.** Rostrum unconstricted. Eyes absent. Article 2 of antenna 1 short, ventral setae widely spread. Article 1 of antenna 2 ['?ensiform'], article 3 with 3 facial setules, facial spines on article 4 in ['?1 row, ?all spines thin'], article 5 ordinary. Right mandibular incisor with ['?3 teeth, right lamina mobilis ?bifid, molar not triturative, with ?3+ basally fused splayed spines; ?special spines; palpal hump ?small] apex of palp article 3 oblique. Inner plate of maxilla 1 with 1 seta, palp 2-articulate. Maxillipeds ordinary, apex of palp article 3 not strongly protuberant, dactyl elongate, apical nail ['?distinct].

Gnathopods ordinary, small ['?dissimilar, gnathopod 2 ?weakly enlarged'], article 5 of gnathopods 1-2 very short, free, palms oblique, propodus ordinary, ovatorectangular, poorly setose anteriorly. Article 5 of pereopods 3-4 ['?without postero proximal setae, article 6 with thin armaments]. Article 2 of pereopod 5 of ['?narrow form'], articles 4-5 of pereopods 5-6 narrow; pereopod 7 ordinary, article 3 slightly enlarged, dactyl ordinary.

Epimera 1-2 ['?without long facial brushes or posterior setae], epimeron 3 of ordinary classification, bearing 4 or more long setae. Urosomite 3 ['?without dorsal hook]. Peduncle of uropod 1 ['?without inter-ramal spike, ’?without major displaced spine, rami of uropods 1-2 ?not continuously spinose to apex, inner ramus of uropod 1 with ?1 row of marginal spines]. Inner ramus of uropod 2 ['?ordinary]. Uropod 3 ['?ordinary, one of rami ?longer than peduncle, bearing ?article 2 on outer ramus, with ?2 apical setae]. Telson ordinary, but slightly elongate. See ‘Relationship’ for male armaments.

**Relationship.** Like *Harpinia* but male armaments distinctive: instead of brushes being present or absent on article 1 of antenna 1 and present on article 1 of flagellum of antenna 1 and on articles 3-4 of antenna 2, and instead of article 1 of primary flagellum on antenna 1 being enlarged and dominant, the male of *Feriharpinia* has a brush of aesthetascs on article 3 of the peduncle of antenna 1. Article 1 of the primary flagellum is not grossly enlarged, and article 5 of antenna 2 has a row of large dorsal calceoli, not found in *Harpinia*.

**Species.** *Feriharpinia ferentaria* Gurjanova, 1977 [279].

**Habitat and distribution.** Marine, Okhotsk Sea, west Kamchatka, 196-230 m, 1 species.

*Foxiphalus* J.L. Barnard


**Type species.** *Pontharpinia obtusidens* Alderman, 1936, original designation.

**Diagnosis.** Rostrum unconstricted. Eyes present. Article 2 of antenna 1 elongate, ventral setae narrowly to widely spread. Article 1 of antenna 2 ensiform, article 3 with 2 facial setules, facial spines on article 4 in 2+ rows, spines thick, article 5 ordinary. Right mandibular incisor with 3 teeth, right lamina mobilis bifid or simple, thick; molar not triturative, with 4+ splayed spines; palpal hump medium, apex of palp article 3 oblique. Inner plate of maxilla 1 with 4 setae, palp 2-articulate. Maxillipeds ordinary, apex of palp article 3 not strongly protuberant, dactyl elongate, apical nail distinct.

Gnathopods ordinary, small, similar, article 5 of ordinary length to elongate, free, palms oblique, propodus ovatorectangular, poorly setose anteriorly. Article 5 of pereopods 3-4 with postero proximal setae, article 6 with thick armaments. Article 2 of pereopod 5 of broad form, articles 4-5 of pereopods 5-6 medium to narrow; pereopod 7 ordinary, article 3 ordinary, dactyl ordinary.

Epimera 1-2 without long facial brushes but with posterior setae, epimeron 3 of ordinary classification, bearing 3 or more long setae. Urosomite 3 without dorsal hook. Peduncle of uropod 1 without inter-ramal spike, with major displaced spine apicomedi ally, or not, rami of
uropods 1-2 not conspicuously spinose to apex, without subapical spines or nails, inner ramus of uropod 1 with 1 row of marginal spines. Inner ramus of uropod 2 ordinary. Uropod 3 ordinary, one of rami not longer than peduncle, bearing article 2 on outer ramus, with 2 apical setae. Telson with supernumerary lateral or dorsal spines (in adults or open sea forms).

**Relationship.** Differing from *Birubius* in the presence of posterior setae on epimeron 2 and the loss of the strong dactylar nail on the maxilliped. Differing from *Rhepoxynius* in the unconstricted rostrum; from *Grandifoxus* in the unconstricted rostrum and 2 or fewer setules on article 3 of antenna 2.

See *Eobrolgus* and *Paraphoxus*.


**Habitat and distribution.** Marine, north-eastern Pacific Ocean, Aleutians to Central America, 0-324 m, 9 species.

*Fuegiphoxus* Barnard & Barnard


**Type species.** Parharpinia fuegiensis Schellenberg, 1931, original designation.

**Diagnosis.** Rostrum unconstricted. Eyes present. Article 2 of antenna 1 short, ventral setae moderately spread. Article 1 of antenna 2 not ensiform, article 3 with 2 facial setules, facial spines on article 4 in 1 or 2+ rows, some spines thick, some spines thin, article 5 ordinary. Right mandibular incisor with 3 teeth, right lacinia mobilis bifid, subflabellate, molar not triturative, with 3 basally fused spines, one of those elongate; palpal hump small, apex of palp article 3 oblique. Inner plate of maxilla 1 with 4 setae, palp 2-articulate. Maxillipeds ordinary, apex of palp article 3 not strongly protuberant, dactyl elongate, apical nail distinct. Gnathopods small, dissimilar, gnathopod 2 weakly enlarged, article 5 of gnathopod 1 of ordinary length, free, of gnathopod 2 short and cryptic, palms oblique, propodus of gnathopods ovato-rectangular, elongate, poorly setose anteriorly. Article 5 of pereopods 3-4 with posteroproliminal setae, article 6 with thin or thick armament. Article 2 of pereopod 5 of broad narrow form, articles 4-5 of pereopods 5-6 medium to narrow; pereopod 7 ordinary, article 3 ordinary, dactyl ordinary.

Epimera 1-2 without long facial brushes or posterior setae, epimeron 3 of ordinary classification, bearing 3 or more long setae. Urosomite 3 without dorsal hook. Peduncle of uropod 1 without inter-ramal spike, without major displaced spine, rami of uropods 1-2 not continuously spinose to apex, without subapical spines or nails, inner ramus of uropod 1 with 1 row of marginal spines. Inner ramus of uropod 2 ordinary. Uropod 3 ordinary, one of rami longer than peduncle, bearing article 2 on outer ramus, with 2 apical setae. Telson ordinary.

**Relationship.** Differing from *Paraphoxus* in the positive but weak division of spine rows on the face of article 4 on antenna 2, the proximal position of the dorsal notch on the same article; elongation of the third spine on the molar; presence of 4 (versus 2) setae on the inner plate of maxilla 1, incompleteness of cryptic condition on carpus of gnathopod 2, presence of ventral setae on epimeron 3 and immersion of apical nails on rami of uropods 1-2.

Differing from *Eyakia* in the short thick article 2 of antenna 1, distinctly enlarged gnathopod 2, untapered article 2 of pereopod 5, and poorly setose epimeron 3.

See *Elpeddo*.

**Species.** *Fuegiphoxus abjectus* J.L. Barnard & C.M. Barnard, 1980b [864]; *F. fuegiensis* (Schellenberg, 1931) (Stephensen, 1949) (J.L. Barnard, 1960a) (Barnard & Drummond, 1978) [867+430+B]; *F. inutilus* J.L. Barnard & C.M. Barnard, 1980b [833]; *F. uncinata* (Chevreux, 1912d) [872].

**Habitat and distribution.** Marine, cold South America and Antarctica, 0-250 m, 4 species.

*Ganba* Barnard & Drummond

Figs 110I, 111G


**Type species.** *Ganba pellati* Barnard & Drummond 1978, original designation.

**Diagnosis.** Rostrum unconstricted. Eyes present. Article 2 of antenna 1 short, ventral setae sparse and confined apically. Article 1 of antenna 2 not ensiform, article 3 with 2 facial setules, facial spines on article 4 in 1 or debatably 2 rows, all spines thick, article 5 short. Right mandibular incisor with 3 teeth, right lacinia mobilis bifid, molar not triturative, with 3 basally fused spines; palpal hump small, apex of palp article 3 truncate. Inner plate of maxilla 1 with 2 setae, palp 2-articulate. Maxillipeds: inner plates partly fused, apex of palp not strongly protuberant, dactyl elongate, apical nail distinct.

Gnathopods dissimilar, gnathopod 2 moderately
enlarged, article 5 of gnathopod 1 of ordinary length, of gnathopod 2 very short, without eusirid attachment, cryptic, palms oblique, propodus of gnathopods 1-2 thin, ovatoangular, elongate, poorly setose anteriorly. Article 5 of pereopods 3-4 with postero proximal setae, article 6 with thin and thick armaments. Article 2 of pereopod 5 of broad form, articles 4-5 of pereopods 5-6 medium to narrow; pereopod 7 ordinary, article 3 ordinary, dactyl ordinary.

Epimera 1-2 without long posterior setae, epimeron 3 of rounded-glabrous classification, bearing 3 or fewer long setae. Urosomite 3 without dorsal hook. Peduncle of uropod 1 without inter-ramal spike, without major displaced spine, rami of uropods 1-2 not continuously spinose to apex, without subapical spines or nails, inner ramus of uropod 1 without rows of marginal spines. Inner ramus of uropod 2 ordinary. Uropod 3 small, rami scarcely longer than peduncle, outer ramus bearing article 2, with 1 apical seta. Telson ordinary.

Relationship. Like Kuritus and Wildus but outer ramus of uropod 3 with only 1 apical seta. Differing from Broilus in the partially fused inner plates of the maxillipeds, thin gnathopod 2 and dominance of spines in place of setae on article 6 of pereopods 3-4.


Habitat and distribution. Marine, southern Australia, sublittoral, 1 species.

**Grandifoxus** J.L. Barnard


Type species. *Phoxus grandis* Stimpson, 1856b, original designation.

Diagnosis. Rostrum constricted. Eyes present. Article 2 of antenna 1 of medium length, ventral setae narrowly or widely spread. Article 1 of antenna 2 ensiform, or not, article 3 with several facial setules or setae, facial spines on article 4 in 2+ rows, spines thick, article 5 ordinary. Right mandibular incisor with 3 teeth, right lacinia mobilis bifid or simple, thin or flabellate, molar not triturative, with 4+ splayed spines; palp hump small, apex of palp article 3 oblique. Inner plate of maxilla 1 with 4, setae, palp 2-articulate. Maxillipeds ordinary, apex of palp article 3 not strongly protuberant, dactyl elongate, apical nail scarcely distinct or absent.

Gnathopods ordinary, small, similar, article 5 free, elongate, palms almost transverse, propodus heavily setose anteriorly, almost trichophoxin in shape. Article 5 of pereopods 3-4 with postero proximal setae, article 6 with thick armaments. Article 2 of pereopod 5 of broad form, articles 4-5 of pereopods 5-6 broad; pereopod 7 ordinary, article 3 ordinary, dactyl ordinary.

Epimera 1-2 without long facial brushes but with posterior setae, epimeron 3 of ordinary classification, bearing 3 or more long setae. Urosomite 3 without dorsal hook. Peduncle of uropod 1 without inter-ramal spike, with major displaced spine apicomemorially or not, rami of uropods 1-2 not continuously spinose to apex, without subapical spines or nails, inner ramus of uropod 1 with 1 row of marginal spines. Inner ramus of uropod 2 ordinary. Uropod 3 ordinary, one of rami longer than peduncle, bearing article 2 on outer ramus, with 2 apical setae. Telson with supernumerary lateral or dorsal spines or setae.

Special character. Coxae 1-3 with teeth or humps ventrally in adults.

Relationship. Like *Metharpinia* but subapical supernumerary nails on dactyls of uropods 1-2 absent, facial armaments on article 3 of antenna 2 more than 2. Differing from *Foxiphalus* in the superornamented article 3 of antenna 2 and the constricted rostrum. From *Rheopxynius* in the second antennal character plus, in most adults, the humped coxae and extra telsonic armament.

Species. See Coyle (1982); *G. acanthinus* Coyle, 1982 [230]; *G. aciculatus* Coyle, 1982 [230]; *G. grandis* (Stimpson, 1856b) (= *G. milleri* Thorsteinson, 1941) (J.L. Barnard, 1960a, 1980b [270]; *G. lindbergi* (Gurjanova, 1953) [230]; *G. longirostris* (Gurjanova, 1938b, 1951) (= *G. lindbergi* Gurjanova, 1953) (J.L. Barnard, 1980b) [230]; *G. nasuta* (Gurjanova, 1936d) (Coyle, 1982) [290+]; *G. robustus* (Gurjanova, 1938b, 1951) [391]; *G. vulpinus* Coyle, 1982 [230]; *G. westi* (Gurjanova, 1980a) [286]; other unnamed species [230].

Habitat and distribution. Marine, Japan Sea to Monterey Bay, California, including Alaska, 0-775 m, 9 species.

**Harpinia** Boeck

Figs 107F, 111C


Type species. *Phoxus plumosus* Kroyer, 1842, original designation.

Diagnosis. Rostrum unconstricted. Eyes absent. Article 2 of antenna 1 short, ventral setae confined apically; article 1 of male peduncle brushy, or not (*H. crenulata*), male primary flagellum with calympophore or not (*H. crenulata*). Article 1 of antenna 2 strongly ensiform, article 3 with 2 facial setules, facial spines on
article 4 in 1 row, spines thin, article 5 very short; male articles 3-4 brushy, male flagellum as short as in female. Right mandibular incisor with 4 teeth, right lacinia mobilis bifid; molar not triturative, with 3+ basally fused or splayed spines; palpal hump small, apex of palp article 3 oblique. Inner plate of maxilla 1 with 2 setae, palp 2-articulate. Maxillipeds ordinary, apex of palp article 3 not strongly protuberant, dactyl elongate or not, apical nail distinct.

Gnathopods small, slightly dissimilar, gnathopod 2 weakly enlarged, article 5 of gnathopods 1-2 very short, free, but tending to be cryptic on gnathopod 2, with weak eusirid attachment, palms oblique, propodus ordinary, ovatorectangular, poorly setose anteriorly. Article 5 of pereopods 3-4 with posteroimal plate setae, article 6 with thin armaments. Article 2 of pereopod 5 of narrow form, articles 4-5 of pereopods 5-6 narrow; pereopod 7 ordinary, article 3 enlarged, dactyl ordinary.

Epimera 1-2 without long posterior setae, epimeron 3 of ordinary classification, bearing 3 or more long setae. Urosomite 3 without dorsal hook. Peduncle of uropod 1 without inter-ramal spike, without major displaced spine, rami of uropods 1-2 not continuously spinose to apex, without subapical spines or nails, inner ramus of uropod 1 with 1 row of marginal spines. Inner ramus of uropod 2 ordinary. Uropod 3 ordinary, bearing article 2 on outer ramus, with 1-2 apical setae. Telson ordinary, or rarely with supernumerary lateral or dorsal armaments.

**Sexual dimorphism.** Mouthparts degenerate in some terminal males.

**Variables.** Specific taxonomy based on teeth of pereopod 7 article 2, tooth of epimeron 3, tooth of head.

**Relationship.** Like *Harpiniopsis* and *Pseudharpinia* but article 1 of primary flagellum on male elongate and brushy; flagellum of male antenna 2 short as in female. See *Feriharpinia*.

**Species.** See J.L. Barnard (1960a); Chevreux and Fage (1925); Gujranova (1951); Karaman (1973a); Lincoln (1979a); Sars (1895); Watling (1981, key); *H. abyssi* Sars, 1879, 1885, 1886, 1895 (= *H. carinata* Sars, 1879) [250AB]; *H. antennaria* Meine, 1893 (= *H. neglecta* Sars, 1895) [216 + B]; *H. bidensata* Stephensen, 1925a [211B]; *H. cabotensis* Shoemaker, 1930a [260]; *H. clivicola* Watling, 1981 [307B]; *H. crenulata* Boeck, 1871b (= *H. nana* Bonnier, 1896) (Sars, 1895) [354 + B]; *H. crenuloides* Stephensen, 1925a [200B]; *H. curtipes* Stephensen, 1925a (?Ledoyer, 1986) [224A + 6718B]; *H. delvallei* Chevreux, 1911d [339 + BA]; *H. laevis* Sars, 1895 (Karaman, 1980c) [240B]; *H. latipes* Norman, 1900c see (*Pseudharpinia*) (Chevreux, 1927) [350B]; *H. mucronata* Sars, 1879, 1885, 1886, 1895 [220B]; *H. pectinata* Sars, 1895 (= *H. mediterranea* Karaman, 1973a) (Watling, 1981) [352 + 220 + B]; *H. plumosa* (Kroyer, 1842) (= *H. fusiformis* Stimpson, 1853) [216 + B]; *H. propingua* Sars, 1895 (Bousfield, 1973) [250 + B]; *H. serrata* Sars, 1879, 1885, 1886, 1895 [250 + B]; *H. truncata* Sars, 1895 (Watling, 1981) [354 + BA].

**Habitat and distribution.** Marine, cool water North Atlantic and Arctic, Mediterranean, 6-3521 m, 17 species.

**Harpiniopsis** Stephensen


**Type species.** *Harpiniopsis similis* Stephensen, 1925a, monotypy.

**Diagnosis.** Rostrum unconstricted, head often with antennal tooth. Eyes absent. Article 2 of antenna 1 short, ventral setae weakly ventral or almost confined apically. Article 1 of antenna 2 not or weakly, ensiform, article 3 with several facial setules, facial spines on article 4 in 1 main row, spines thin, article 5 ordinary to short. Right mandibular incisor with 3-4 teeth, right lacinia mobilis bifid or simple, flabellate or thin, molar not triturative, with 2+ splayed spines; palpal hump small, apex of palp article 3 oblique. Inner plate of maxilla 1 with 2 setae, palp 2-articulate. Maxillipeds internal plates poorly armed, thick, apex of palp article 3 not strongly protuberant, dactyl stubby, apical nail distinct, elongate.

Gnathopods ordinary, small, similar, or gnathopod 2 weakly enlarged, article 5 of gnathopods 1-2 very short, free to cryptic, palms oblique, propodus ordinary to thin, ovatorectangular to elongate, poorly setose anteriorly. Article 5 of pereopods 3-4 with posteroimal plate setae, article 6 with thin armaments. Article 2 of pereopod 5 of narrow form, articles 4-5 of pereopods 5-6 narrow; pereopod 7 ordinary (often with spike teeth), article 3 enlarged, dactyl ordinary.

Epimera 1-2 without long facial brushes or posterior setae, epimeron 3 variable, of ordinary or rounded classification, bearing 3 or more or 3 fewer long setae. Urosomite 3 without dorsal hook. Peduncle of uropod 1 without inter-ramal spike, without major displaced spine, rami of uropods 1-2 not continuously spinose to apex, without subapical spines or nails, inner ramus of uropod 1 with 1 row of marginal spines. Inner ramus of uropod 2 ordinary. Uropod 3 ordinary, one of rami longer than peduncle, bearing article 2 on outer ramus, with 0-2 apical setae. Telson ordinary or with supernumerary lateral or dorsal setae.

**Variables.** Epistome often produced; article 2 of pereopod 7 often with spike teeth; outer ramus of uropod 1 sometimes shortened; apical setae on outer ramus of uropod 2 often vestigial.

**Relationship.** More ancestral than *Harpinia*; male antennae of normal phoxocephalid character, with elongate flagellum on antenna 2, no special brushes on antenna 1 besides normal basomedial brush on article 1; antenna 2 poorly ensiform. Like *Heterophoxus* but eyes absent.
See *Pseudharpinia*.


**Habitat and distribution.** Marine, cosmopolitan in cold water except North Atlantic shallows (replaced by *Harpinia*), 2-6580 (confirmed) m, 27 species.

*Heterophoxus* Shoemaker

Fig.109E


**Type species.** *Heterophoxus pennatus* Shoemaker, 1925 (= *Harpinia oculata* Holmes, 1908), monotypy.

**Diagnosis.** Rostrum unconstricted. Eyes present. Article 2 of antenna 1 short, ventral setae widely spaced, but almost confined apically. Article 1 of antenna 2 strongly ensiform, article 3 with many facial setules, facial spines on article 4 in 1 main row, spines thin, article 5 very short. Right mandibular incisor with 4+ teeth, right lacinia mobilis bifid, flabellate, molar not triturative, with 3 basally fused spines; palpar hump medium, apex of palp article 3 oblique. Inner plate of maxilla 1 with 2 setae, palp 2-articulate. Maxillipedal inner plates partly fused, poorly armed, apical spine of palp article 3 not strongly protuberant, dactyl not elongate, but apical nail distinct. Gnathopods small, similar, article 5 of gnathopods 1-very short, without eusirid attachment, almost cryptic, tels oblique, propodus of gnathopods 1-2 obresectangular, elongate, poorly setose anteriorly, article 5 of pereopods 3-4 with posteroapical setae, ticle 6 with thin armaments. Article 2 of pereopod 5 of narrow form, articles 4-5 of pereopods 5-6 narrow; pereopod 7 of ordinary size, article 3 enlarged, dactyl ordinary.

Epimeras 1-2 without long midfacial brushes or posterior setae, epimeron 3 of ordinary classification, bearing 3 or more long setae. Urosome 3 without dorsal hook. Peduncle of uropod 1 without inter-ramal spike, without displaced spine, rami of uropods 1-2 continuously spinose to apex, or not, inner ramus of uropod 1 with 1 row of marginal spines. Inner ramus of uropod 2 ordinary. Uropod 3 ordinary, one of rami longer than peduncle, bearing article 2 on outer ramus, with 2 apical setae. Telson ordinary or with supernumerary lateral spines.

**Relationship.** Probably close to the ancestral harpiniini: with eyes, ensiform antenna 2, and continuously spinose rami of uropods 1-2 (in some taxa). Without antennal brushes of male *Harpinia* and *Feriharpinia*. *Coxophoxus* has a triturative molar. *Pseudharpinia* and *Palabrophoxus* lack eyes; so does *Harpiniopsis* which retains a moderate ensiform process. See *Proharpinia*, *Torridoharpinia* and *Basuto*, all lacking ensiform process (see Karaman, 1980c: 152).


**Habitat and distribution.** Marine, Antarctica, Africa, Pan-America, 2-1941 m, 6 species.

*Hopiphoxus* Barnard & Drummond

Hopiphoxus Barnard & Drummond, 1978: 469.

**Type species.** *Metaphoxus similimus* J.L. Barnard, 1967a, original designation.

**Diagnosis.** Rostrum unconstricted. Eyes absent. Article 2 of antenna 1 short, ventral setae confined apically. Article 1 of antenna 2 not ensiform, article 3 with 2 facial setules, facial spines on article 4 in 1 row, spines thin, article 5 ordinary. Right mandibular incisor with [?] teeth, right lacinia mobilis bifid, flabellate, molar not triturative, with 2 basally fused spines; palp hump small, apex of palp article 3 oblique. Inner plate of maxilla 1 without setae, palp 1-articulate. Maxillipeds with small plates poorly armed, apex of palp article 3 not strongly protuberant, dactyl elongate, apical nail distinct.

Gnathopods large, similar, gnathopod 2 highly elongated, article 5 of gnathopods 1-2 very short, cryptic, palm oblique, propodus broadened, poorly setose anteriorly. Article 5 of pereopods 3-4 with
Japara f. posteroproximal setae, article 6 with thin armaments. Article 2 of pereopod 5 of broad form, articles 4-5 of pereopods 5-6 narrow; pereopod 7 ordinary, article 3 ordinary, dactyl ordinary.

Epimera 1-2 without long facial brushes or posterior setae, epimeron 3 of rounded classification, bearing 3 or fewer long setae. Urosomite 3 without dorsal hook. Peduncle of uropod 1 without inter-ramal spine, without major displaced spine, some rami of uropods 1-2 continuously setose to apex; inner ramus of uropod 1 with 1 row of marginal setae. Inner ramus of uropod 2 ordinary. Uropod 3 ordinary, one of rami longer than peduncle, bearing long article 2 on outer ramus, with 2 weak apical setae. Telson elongate.

**Additional character.** Uropods 1-2 with setae on rami.

**Relationship.** Generally distinguished from genera around Metaphoxus in the setose rami of uropods 1-2 but differing from the very apomorphic Kondoleus in the ordinary antennae and urosome and unfused inner ramus of uropod 2.

**Species.** Hopiphoxus similimus (J.L. Barnard, 1967a) [309A].

**Habitat and distribution.** Marine, Baja California, Cedros Trench, 2706 m, 1 species.

*Japara* Barnard & Drummond
Fig.111L


**Type species.** *Japara papporus* Barnard & Drummond, 1978, original designation.

**Diagnosis.** Rostrum unconstricted but obsolescent. Eyes present. Article 2 of antenna 1 of medium length, ventral setae confined apically. Article 1 of antenna 2 not ensiform, article 3 with 2 facial setules, facial spines on article 4 in 1 row, spine(s) thick, article 5 very short. Right mandibular incisor with 3 teeth, right lacinia mobilis bifid, flabellate, molar not triturative, with 4+ basally fused spines, one enlarged, elongate; palpal hump small, apex of palp article 3 oblique. Inner plate of maxilla 1 without setae, palp 1-articulate. Maxillipeds with inner plates partly fused, inner and outer poorly armed, apex of palp article 3 not strongly protuberant, dactyl elongate, apical nail distinct.

Gnathopods large, dissimilar, gnathopod 2 moderately enlarged, article 5 of gnathopod 1 of ordinary length, with eusirid attachment, of gnathopod 2 short and cryptic, palm of gnathopod 1 transverse to chelate, of gnathopods 2 oblique, propodus ovato-rectangular, respectively elongate, and broadened, poorly setose anteriorly. Article 5 of pereopods 3-4 without posteroproximal setae, article 6 with thin armaments. Article 2 of pereopod 5 of broad form, articles 4-5 of pereopods 5-6 medium to narrow respectively; pereopod 7 ordinary, article 3 ordinary, dactyl ordinary.

Epimera 1-2 without long facial brushes or posterior setae, epimeron 3 of rounded classification, bearing 3 or fewer long setae. Urosomite 3 without dorsal hook. Peduncle of uropod 1 without inter-ramal spine, without major displaced spine, rami of uropods 1-2 not continuously spinose to apex, inner ramus of uropod 1 without marginal spines. Inner ramus of uropod 2 ordinary. Uropod 3 minute, rami much shorter than peduncle, lacking article 2 on outer ramus. Telson ordinary, but normally lateral setule pairs now distal.

**Relationship.** Differing from Metaphoxus, Parametaphoxus, Metaphoxoides, Cephalophoxus and Mesophoxus in the short uropod 3 with short rami; from *Metaphoxus* and *Cephalophoxus* in the chelate gnathopod 1; from the latter in the more elongate carpus of gnathopod 1; from *Mesophoxus* (with short uropod 3) in the enlarged gnathopods, weak rostrum, short article 2 of antenna 1, poor facial armament on article 4 of antenna 2, from both *Mesophoxus* and Paramesophoxus in the short palp of maxilla 1; from Paramesophoxus also in the large gnathopods with cryptic carpus and weak armament of antenna 2.

**Species.** *Japara papporus* Barnard & Drummond, 1978 [784].

**Habitat and distribution.** Marine, south-eastern Australia, 10-43 m, 1 species.

*Jerildaria* Barnard & Drummond

*Jerildaria* Barnard & Drummond, 1978: 442.

**Type species.** *Jerildaria joubiphoxus* Barnard & Drummond, 1978, original designation.

**Diagnosis.** Rostrum unconstricted. Eyes present. Article 2 of antenna 1 of medium length, ventral setae confined apically. Article 1 of antenna 2 not ensiform, article 3 with 2 facial setules, facial spines on article 4 in 1 row, spine(s) thick, article 5 very short. Right mandibular incisor with 3 teeth, right lacinia mobilis bifid, flabellate, molar not triturative, with 4+ basally fused spines, one enlarged, elongate; palpal hump small, apex of palp article 3 oblique. Inner plate of maxilla 1 without setae, palp 1-articulate. Maxillipeds with inner plates partly fused, inner and outer poorly armed, apex of palp article 3 not strongly protuberant, dactyl elongate, apical nail distinct.

Gnathopods large, dissimilar, gnathopod 2 moderately enlarged, article 5 of gnathopod 1 of ordinary length, with eusirid attachment, of gnathopod 2 short and cryptic, palm of gnathopod 1 transverse to chelate, of gnathopods 2 oblique, propodus ovato-rectangular, respectively elongate, and broadened, poorly setose anteriorly. Article 5 of pereopods 3-4 with posteroproximal setae, article 6 with thin armaments. Article 2 of pereopod 5 of broad form, articles 4-5 of pereopods 5-6 medium to narrow respectively; pereopod 7 ordinary, article 3 ordinary, dactyl ordinary.
with thick armaments. Article 2 of pereopod 5 of broad form, articles 4-5 of pereopods 5-6 medium to narrow; pereopod 7 ordinary, article 3 ordinary, dactyl ordinary.

Epimera 1-2 without long facial brushes, but with sparse posterior setae; epimeron 3 of ordinary classification, bearing 3 or more long setae. Urosomite 3 without dorsal hook. Peduncle of uropod 1 without inter-ramal spike, without major displaced spine, rami of mmuropods 1-2 not continuously spinose to apex, without subapical spines or naiis, inner ramus of uropod 1 with 0-1 row of marginal spines. Inner ramus of uropod 2 ordinary. Uropod 3 ordinary, one of rami longer than peduncle, bearing short article 2 on outer ramus, with 2 apical setae. Telson elongate.

**Relationship.** Differing from *Phoxocephalus, Cephalophoxus* and *Cephalophoxoides* in the enlarged gnathopods with elongate eusirid article 5 on gnathopod 1. Differing also from *Phoxocephalus* and *Cephalophoxoides* in the shortened article 2 on the outer ramus of uropod 3. Differing from *Parajoubinella* in the subcryptic carpus of gnathopod 2.

Like *Eusyrophoxus* but article 2 on outer ramus of uropod 3 short, article 2 on antenna 1 longer, and armaments on article 4 of antenna 2 well developed.

**Species.** *Jerildaria jouphoxus* Barnard & Drummond, 1978 [781].

**Habitat and distribution.** Marine, New South Wales, 43 m, 1 species.

*Joubinella* Chevreux

*Figs 1080, 110E*


**Type species.** *Joubinella ciliata* Chevreux, 1908a, monotypy.

**Diagnosis.** Divisible into 2 genera. Rostrum unconsctricted. Eyes present. Article 2 of antenna 1 elongate to medium in length, ventral setae absent or confined apically. Article 1 of antenna 2 not ensiform, article 3 with 2 facial setules, facial spines on article 4 variable, in 1, 2+ rows, or absent, article 5 ordinary to very thin. Right mandibular incisor with [23 ?4 teeth, right lacinia mobilis ?bifid, ?simple, ?flabellate, ?absent], molar triturative; palpap humb small, apex of palp article 3 oblique. Inner plate of maxilla 1 without setae, palp 2-articulate. Maxillipeds ordinary, apex of palp article 3 not strongly protuberant, dactyl elongate, apical nail distinct.

Gnathopods dissimilar, moderately to strongly enlarged, article 5 of gnathopod 1 free, elongate, with eusirid attachment, on gnathopod 2 similar or cryptic, palms transverse to chelate, propodus of gnathopods 1-2 broadened, poorly setose anteriorly. Article 5 of gnathopods 3-4 with postero proximal setae, article 6 with thin and thick armaments. Article 2 of pereopod 5 of broad form, but tapering distally, articles 4-5 of pereopods 5-6 medium to narrow; pereopod 7 ordinary, article 3 ordinary, dactyl ordinary.

Epimera 1-2 without long facial brushes or posterior setae, epimeron 3 of rounded classification, bearing 3 or fewer long setae. Urosomite 3 without dorsal hook. Peduncle of uropod 1 with or without inter-ramal spike, without major displaced spine, rami of uropods 1-2 continuously spinose to apex or not, inner ramus of uropod 1 with 1 row of marginal spines. Inner ramus of uropod 2 ordinary. Uropod 3 ordinary, one of rami longer than peduncle, bearing article 2 on outer ramus, with 0-2 apical setae. Telson ordinary.

**Relationship.** The only joubinellin with triturative molar; gnathopods extremely predatory; facial spines on antenna 2 poorly organised; flagellum of female antenna 2 severely reduced.

**Species.** *Joubinella bychovskii* Gurjanova, 1952b [286]; *J. ciliata* Chevreux, 1908a [358B]; *J. indentata* Ledoyer, 1986 [618B]; *J. streklovi* Gurjanova, 1952b [290B]; *J. traditor* Pirlot, 1932b (J.L. Barnard, 1961b) [600B]; *J. tzvetkova* Kudrjaschov, 1965c [282].

**Habitat and distribution.** Marine, world pelagic, 20-1340 m, 5 species.

*Kondoleus* Barnard & Drummond

*Figs 109J, 1111*


**Type species.** *Kondoleus tekin* Barnard & Drummond, 1978, original designation.

**Diagnosis.** Rostrum unconstricted, obsolescent. Eyes present. Article 2 of antenna 1 of medium length, forming sleeve around base of article 3, ventral setae confined apically. Article 1 of antenna 2 not ensiform, article 3 with 2 facial setules, facial spines on article 4 in 2+ rows, all spines thick, spheroid, article 5 very short. Right mandibular incisor with 4+ teeth, right lacinia mobilis flabellate, molar not triturative, with 3 basally fused elongate spines; palpap humb small, apex of palp article 3 oblique. Inner plate of maxilla 1 without setae, palp 1-articulate. Maxillipeds inner plates small, with basal spouts, armament sparse, apex of palp article 3 not strongly protuberant, dactyl not elongate, stubby apical nail distinct.

Gnathopods large, dissimilar, gnathopod 2 moderately enlarged, article 5 of gnathopod 1 free, elongate, with eusirid attachment, of gnathopod 2 short and cryptic,
palms chelate, propodus of gnathopods 1-2 respectively trapezoidal and ovatorectangular, of gnathopod 2 broadened, both poorly setose anteriorly. Article 5 of pereopods 3-4 without posteroproximal setae, article 6 with thick armentums. Article 2 of pereopod 5 of broad form, articles 4-5 of pereopods 5-6 broad; pereopod 7 ordinary, article 3 ordinary, dactyl ordinary.

Epimera 1-2 without long facial brushes or posterior setae, epimeron 3 of rounded classification, bearing 3 or fewer long setae. Urosomite 3 without dorsal hook. Peduncle of uropod 1 without inter-ramal spike, without major displaced spine, rami of uropods 1-2 not continuously spinose to apex, but some with setae, inner rami of uropod 1 with 1 row of marginal seta(e). Inner rami of uropod 2 fused to peduncle. Uropod 3 minute, one of rami scarcely longer than peduncle, bearing article 2 on outer ramus, with 2 apical setae. Telson elongate.

Special characters. Spines on antenna 2 spheric; flagella of antenna 1 and in female of antenna 2 weak to vestigial; maxillipeds with basal spouts; articles 4-5 of pereopods 5-6 rhomboid; some rami of uropods 1-2 with long setae; urosomite 1-2 fused, engorged, glandular.

Relationship. Differing from Metaphoxus, Joubinella, Hopiphoxus, and their relatives in the fully fused inner ramus of uropod 2, the large vertical brushes of setae on epimera 1-2, the short coxae and the wide spread dorsolateral spination on the peduncle or uropod 1.

Species. Kotla barnardi Barnard & Drummond, 1978 [782].

Habitat and distribution. Marine, Victoria, 8-18 m, 1 species.

Kotla Barnard & Drummond

Figs 107D, 109K, 111K


Type species. Kotla barnardi Barnard & Drummond, 1978, original designation.

Diagnosis. Rostrum unconstricted, obsolescent. Eyes present. Article 2 of antenna 1 elongate, ventral setae almost confined apically. Article 1 of antenna 2 not ensiform, article 3 with 2 facial setules, facial spines on article 4 in 3+ rows, all spines thick, article 5 ordinary. Right mandibular incisor with 3 teeth, right lacinia mobilis bifid, slender; molar not triturative, with 7+ basally fused spines; palpal hump small, apex of palp article 3 oblique. Inner plate of maxilla 1 with 4 setae, palp 2-articulate.

Maxillipeds ordinary apex of palp article 3 not strongly protuberant, dactyl elongate, apical nail distinct. Gnathopods similar, weakly enlarged, article 5 of gnathopods 1-2 free, elongate, without eusirid attachment, palms transverse, propodus broadened, poorly setose anteriorly. Article 5 of pereopods 3-4 with posteroproximal setae, article 6 with thick armentums. Article 2 of pereopod 5 of broad form, articles 4-5 of pereopods 5-6 broad to medium, pereopod 7 ordinary, article 3 not enlarged, dactyl ordinary.

Epimera 1-2 with long facial brushes but no posterior setae, epimeron 3 of ordinary classification, bearing 3 or more long setae. Urosomite 3 without dorsal hook. Peduncle of uropod 1 without inter-ramal spike, without major displaced spine, rami of uropods 1-2 not continuously spinose to apex, without subapical spines or nails, inner rami of uropod 1 with 1 row of marginal spines. Inner rami of uropod 2 fused to peduncle. Uropod 3 minute, rami not longer than peduncle, bearing article 2 on outer ramus, with 2 apical setae. Telson ordinary.

Additional characters. Coxae short; spination on peduncle of uropod 1 very widely spread.

Relationship. Differing from Matong in the fully fused inner ramus of uropod 2, the large vertical brushes of setae on epimera 1-2, the short coxae and the widely spread dorsolateral spination on the peduncle or uropod 1.

Species. Kotla batturi Barnard & Drummond, 1978 [782].

Habitat and distribution. Marine, Victoria, 18 m, 1 species.


Type species. Kulgaphoxus borralus Barnard & Drummond, 1978, original designation.

Diagnosis. Rostrum unconstricted, obsolescent. Eyes present. Article 2 of antenna 1 elongate, ventral setae narrowly spread, almost confined proximally. Article 1 of antenna 2 not ensiform, article 3 with 2 facial setules, facial spines on article 4 in 2+ rows, all spines thick, article 5 ordinary. Right mandibular incisor with 3 teeth, right lacinia mobilis bifid, flabellate, molar not triturative, with 4+ splayed spines; palpal hump small, apex of palp article 3 oblique. Inner plate of maxilla 1 with 4 setae, palp 2-articulate. Maxillipeds ordinary, apex of palp article 3 not strongly protuberant, dactyl elongate, apical nail distinct.

Gnathopods ordinary, small, similar, gnathopod 2 weakly enlarged, article 5 of gnathopods 1-2 free,
elargite, without eusirid attachment, palms oblique, propodus of gnathopods 1-2 thin, rectangular, elongate, poorly setose anteriorly, but almost trichophoxin in shape. Article 5 of pereopods 3-4 with posteroproximal setae, article 6 with thick armaments. Article 2 of pereopod 5 of broad form, articles 4-5 of pereopods 5-6 broad; pereopod 7 ordinary, article 3 ordinary, dactyl ordinary or vestigial.

Epimera 1-2 with long facial brushes of setae, epimenon 3 of ordinary classification, bearing 3 or more long setae. Urosomite 3 with dorsal hook. Peduncle of uropod 1 without inter-ramal spike, without major displaced spine, rami of uropods 1-2 with subapical spines or nails, inner rami of uropod 1 with 1 row of marginal spines. Inner ramus of uropod 2 shortened. Uropod 3 short, rami not longer than peduncle, bearing article 2 on outer ramus, with 2 apical setae. Telson ordinary to elongate.

Special characters. Article 4 of antenna 2 with only 1 set of dorsal setae; coxa 4 perfectly rectangular (versus Tickalerus).

Relationship. Differing from Birubius in the shortened rami of uropod 3 and in the enlarged dorsal hook of urosomite 3. From Tickalerus, Kulgaphoxus differs in the proximal placement of setae on article 2 of antenna 1, the presence of only 1 set of dorsal setae on article 4 of antenna 2, the presence of accessory nails on the inner rami of uropods 1-2 and the perfectly rectangular coxa 4.


Habitat and distribution. Marine, Victoria, 1-15 m, 2 species.

Kuritus Barnard & Drummond


Type species. Kuritus nacoomus Barnard & Drummond, 1978, original designation.

Diagnosis. Rostrum unconstricted. Eyes present. Article 2 of antenna 1 short, ventral setae confined apically. Article 1 of antenna 2 not ensiform, article 3 with 2 facial setules, facial spines on article 4 weakly in 2 rows, some spines thick, some spines thin, article 5 ordinary. Right mandibular incisor with 3 teeth, right lacinia mobilis bifid, thin, molar partly triturative, with 3 basally fused spines; palpal hump small, apex of palpal article 3 scarcely oblique. Inner plate of maxilla 1 with 2 setae, palp 2-articulate. Maxillipeds ordinary, apex of palp article 3 not strongly protuberant, dactyl elongate, apical nail distinct.

Gnathopods small, similar, article 5 of ordinary length, free, palms oblique, propodus thin, rectangular, elongate, poorly setose anteriorly. Article 5 of pereopods 3-4 with posteroproximal setae, article 6 with thick armaments. Article 2 of pereopod 5 of broad form, articles 4-5 of pereopods 5-6 narrow; pereopod 7 ordinary, article 3 ordinary, dactyl ordinary. Epimera 1-2 without long facial brushes or posterior setae, epimenon 3 of rounded classification, bearing 3 or fewer long setae. Urosomite 3 without dorsal hook. Peduncle of uropod 1 without inter-ramal spike, without major displaced spine, rami of uropods 1-2 not continuously spinose to apex, without subapical spines or nails, inner rami of uropod 1 with 1 row of marginal spines. Inner ramus of uropod 2 ordinary. Uropod 3 ordinary, one of rami longer than peduncle, bearing article 2 on outer ramus, with 2 long apical setae. Telson elongate.

Relationship. Differing from Broglus and Ganba in bearing 2 apical setae on the outer ramus of uropod 3; from Wildus and Broglus in the thin gnathopods identical to each other and with free carpi.

See Paraphoxus.


Habitat and distribution. Marine, western Australia, Barrow Island, neritic, 1 species.

Leongathus Barnard & Drummond

Figs 107C, 108K, 109H

Leongathus Barnard & Drummond, 1978: 146.

Type species. Leongathus nootoo Barnard & Drummond, 1978, original designation.

Diagnosis. Rostrum unconstricted. Eyes weak or absent. Article 2 of antenna 1 of medium length, ventral setae confined proximally. Article 1 of antenna 2 weakly ensiform, article 3 with 2 facial setules, facial spines on article 4 in 1 main row, spines thick, article 5 ordinary. Right mandibular incisor with 3 teeth, right lacinia mobilis bifid, thin, molar partly triturative, with 7+ large teeth, palpal hump medium apex of palpal article 3 oblique. Inner plate of maxilla 1 with 4 setae, palp 2-articulate. Maxillipeds ordinary, apex of palp article 3 not strongly protuberant, dactyl elongate, apical nail not distinct.

Gnathopods dissimilar, gnathopod 2 strongly enlarged, article 5 of gnathopod 1 of ordinary length, free, of gnathopod 2 short, cryptic, palms oblique, propodus of gnathopods 1-2 respectively thin and broadened, poorly setose anteriorly. Article 5 of pereopods 3-4 with posteroproximal setae, article 6 with mostly thin armaments. Article 2 of pereopod 5 of broad form, but tapering distally, articles 4-5 of pereopods 5-6 narrow;
Epimera 1-2 with facial and posterior setae, epimeron 3 of ordinary classification, bearing 3 or more long setae. Urosomite 3 without dorsal hook.

Relationship. The only phoxocephalid with such an unusual molar; distinct from *Fontharpinia* in the nonsetose telson, poorly setose article 3 of antenna 2, poorly setose dactyl of pereopod 7, nonbundled setae of pereopod 7 and elongation of peduncular spines on uropod 2. From *Mang, Kotia* and *Yamnacoona* differing in the cryptic article 5 of gnathopod 2, tapering article 2 of pereopod 5, normal coxae 1-3, and the presence of facial setae on article 2 of pereopod 7. Differing from *Mandibulophoxus* and *Basiu* in the elongate article 2 of antenna 1 with proximally situated ventral setae, and the lack of continuous armaments on the rami of uropods 1-2.

**Species.** *Leongathus nootoo* Barnard & Drummond, 1978 [781].

**Habitat and distribution.** Marine, New South Wales, 150 m, 1 species.

### *Leptophoxoides* J.L. Barnard


**Type species.** *Leptophoxoides molarius* J.L. Barnard, 1962d, original designation.

**Diagnosis.** Rostrum unconstricted but downcurved apically. Eyes absent. Article 2 of antenna 1 short, ventral setae confined apically. Article 1 of antenna 2 not ensiform, article 3 with [?2] facial setules, facial spines on article 4 in 1 main row, all spines thin, article 5 short. Right mandibular incisor with 3 teeth, right lacinia mobilis bifid, thin, molar triturative; palp hump small, apex of palp article 3 truncate. Inner plate of maxilla 1 without setae, palp 1-articulate. Maxillipeds with small plates, poorly armed, apex of palp article 3 strongly protuberant, dactyl elongate, apical nail distinct.

Gnathopods dissimilar, gnathopod 2 strongly enlarged, article 5 of gnathopods 1-2 very short, cryptic, palms oblique, propodus of gnathopods 1-2 ordinary and broadened, respectively, poorly setose anteriorly. Article 5 of pereopods 3-4 with postero-proximal setae, article 6 with thin armaments. Article 2 of pereopod 5 of broad form, articles 4-5 of pereopods 5-6 narrow; pereopod 7 ordinary, article 3 ordinary, dactyl [unknown].

Epimera 1-2 without long facial brushes or posterior setae, epimeron 3 of rounded classification, bearing 3 or fewer long setae. Urosomite 3 with dorsal hook. Peduncle of uropod 1 without inter-ramal spike, without major displaced spine, rami of uropods 1-2 not continuously spinose to apex, without subapical spines or nails, inner ramus of uropod 1 with 1 row of marginal spines. Inner ramus of uropod 2 ordinary. Uropod 3 ordinary, one of rami longer than peduncle, bearing article 2 on outer ramus, with 2 apical setae. Telson ordinary.

**Relationship.** Like *Leptophoxus* but molar triturative.

**Species.** *Leptophoxoides molarius* J.L. Barnard, 1962d [702A].

**Habitat and distribution.** Marine, Cape Basin, South Africa, 4961 m, 1 species.

*Leptophoxus* Sars

Figs 107A, 108A, 111F


**Type species.** *Phoxus falcatus* Sars, 1883, monotypy.

**Diagnosis.** Rostrum unconstricted but downcurved apically. Eyes absent. Article 2 of antenna 1 short, ventral setae confined apically. Article 1 of antenna 2 not ensiform, article 3 with 2 facial setules, facial spines on article 4 in 1 ragged row, all spines thin, article 5 ordinary. Right mandibular incisor with 3 teeth, right lacinia mobilis bifid, thin, molar triturative, with 3 basally fused spines; palp hump small, apex of palp article 3 truncate. Inner plate of maxilla 1 without setae, palp 1-articulate. Maxillipeds plates feeble, apex of palp article 3 strongly protuberant, dactyl elongate, apical nail distinct.

Gnathopods dissimilar, gnathopod 2 strongly enlarged, article 5 of gnathopods 1-2 very short, with eusirid attachment, cryptic, palms oblique, propodus of gnathopod 1 ordinary, ovato-rectangular, elongate, of gnathopod 2 broadened, both poorly setose anteriorly. Article 5 of pereopods 3-4 without posteroproximal setae, article 6 with thin armaments. Article 2 of pereopod 5 of broad form, pyriform, articles 4-5 of pereopods 5-6 narrow; pereopod 7 ordinary, article 3 ordinary, dactyl ordinary.

Epimera 1-2 without long facial brushes or posterior setae, epimeron 3 of rounded classification, bearing 3 or fewer long setae. Urosomite 3 with dorsal hump. Peduncle of uropod 1 without inter-ramal spike, with no major displaced spine, rami of uropods 1-2 not
continuously spinose to apex, inner ramus of uropod 1
with 1 row of marginal spines. Inner ramus of uropod 2
ordinary. Uropod 3 ordinary, one of rami longer than
peduncle, bearing elongate article 2 on outer ramus,
with 2 apical setae. Telson ordinary but elongate.

**Relationship.** Like *Leptophoxoides* but mandibular
molar not triturative. These are the phoxocephalinid
with strongly protuberant article 3 of the maxillipedal palp.

**Species.** *Leptophoxus falcatus* (Sars, 1883, 1895) (J.L.
Barnard, 1960a) [250]; *L. icelus* J.L. Barnard, 1960a
[310].

**Habitat and distribution.** Marine Arctic North
Atlantic, North Pacific, 56-2258 m, 1 species.

*Limnoporeia* Fearn-Wannan

Fig.109J

*Limnoporeia* Fearn-Wannan, 1968a: 37.–Barnard & Drummond,
1978: 487.

**Type species.** *Limnoporeia kingi* Fearn-Wannan, 1968a,
monotypy.

**Diagnosis.** Rostrum variable, unconstricted, but often
elongate and with apicoventral tooth. Eyes present.
Article 2 of antenna 1 elongate, or of medium length
(type), ventral setae almost confined apically. Article 1
of antenna 2 not ensiform, article 3 with 2 facial setules,
facial spines on article 4 in 2-4 rows, some spines thick,
some spines thin, article 5 ordinary. Right
mandibular incisor with 3 teeth, right lacinia mobilis
flabellate, molar not triturative, conical, with 3 or fewer
basally fused spines; palpal hump small to medium, apex
of palp article 3 oblique. Inner plate of maxilla 1 without
setae, palpal 1-articulate. Maxillipeds with small poorly
armed plates, apex of palpal article 3 not strongly
protuberant, dactyl elongate, apical nail distinct.

Gnathopods medium, dissimilar, gnathopod 2
moderately to strongly enlarged, article 5 of gnathopod
1 of ordinary length to elongate, free, of gnathopod 2
short, cryptic, palms chelate, propodus of gnathopods 1-
2 thin, elongate, poorly setose anteriorly. Article 5 of
pereopods 3-4 without posteroproximal setae, article 6
with thin and thick armaments. Article 2 of pereopod 5
of broad form, articles 4-5 of pereopods 5-6 narrow;
pereopod 7 ordinary, article 3 ordinary, dactyl
ordinary.

Epimera 1-2 without long facial brushes or posterior
setae, epimeron 3 of rounded classification, bearing 3 or
fewer long setae. Urosomite 3 without dorsal hook.
Peduncle of uropod 1 without inter-ramal spike, without
major displaced spine, ram of uropods 1-2 not
continuously spinose to apex, inner ramus of uropod 1
with 0-1 row of marginal spines. Inner ramus of uropod 2
ordinary. Uropod 3 ordinary, one of rami longer than
peduncle, bearing article 2 on outer ramus, with 2 apical
setae. Telson elongate.

**Variables.** Article 2 of antenna 1 elongate (*L.
woorake*); dactyls of pereopods 3-4 occasionally vestigial;
propodus of gnathopods broad and poorly chelate
(*L. woorake*).

**Relationship.** Differing from *Metaphoxus* and
*Parametaphoxus* in the much stronger chelation of both
pairs of gnathopods.

See *Uldanamia* and *Parajoubinella*.

**Species.** *Limnoporeia kalduke* Barnard & Drummond,
1978 [782]; *L. kingi* Fearn-Wannan, 1968a [784E]; *L.
maranowe* Barnard & Drummond, 1978 [782]; *L. waggula*
Barnard & Drummond, 1978 [782]; *L. wakkine* Barnard &
Drummond, 1978 [784]; *L. woorake* Barnard & Drummond,
1978 [784].

**Habitat and distribution.** Marine, Victoria and
New South Wales, 0-35 m, also inland salt lakes, 7
species.

*Mandibulophoxus* J.L. Barnard

Fig.108H

*Mandibulophoxus* J.L. Barnard, 1957: 432.–Barnard &
Drummond, 1978: 90.

**Type species.** *Mandibulophoxus gilesi* J.L. Barnard,
1957a, original designation.

**Diagnosis.** Rostrum unconstricted. Eyes absent.
Article 2 of antenna 1 short, ventral setae almost
confined apically. Article 1 of antenna 2 not ensiform,
article 3 with [72] facial setules, facial spines on article
4 in 1 row, all spines thin, article 5 ordinary. Right
mandibular incisor with 2 weak teeth, right lacinia
mobilis flabellate, molar not triturative, with 3 spines;
palp hump huge, apex of palp article 3 oblique. Inner
plate of maxilla 1 with 4 setae, palp 2-articulate.
Maxillipeds ordinary, apex of palpal article 3 not
protuberant, dactyl elongate, apical nail distinct.

Gnathopods dissimilar, gnathopod 2 weakly to
moderately enlarged, article 5 of gnathopod 1 elongate,
without eusirid attachment, of gnathopod 2 short, almost
cryptic, palms oblique, propodus of gnathopods 1-2
subrectangular, of gnathopod 2 slightly broadened,
poorly setose anteriorly. Article 5 of pereopods 3-4
without posteroproximal setae, article 6 with thin
armaments. Article 2 of pereopod 5 of broad form, but
tapering proximally, articles 4-5 of pereopods 5-6
broad to medium, pereopod 7 ordinary, article 3
ordinary, dactyl ordinary.
Epimera 1-2 without long posterior setae, epimeron 3 of ordinary classification, bearing 3 or more long setae. Urosomite 3 without dorsal hook. Peduncle of uropod 1 without inter-ramal spike, with major displaced spine apicodistally, rami of uropods 1-2 continuously spinose to apex, with subapical spines or nails, inner ramus of uropod 1 with 1 row of marginal spines. Inner ramus of uropod 2 ordinary. Uropod 3 ordinary, bearing article 2 on outer ramus, with 3 apical setae. Telson ordinary.

**Relationship.** Differing from *Urophoxus (= Pontharpinia)* in the nontriturative mandibular molar, the absence of a setal brush on the telson, the reduction to 2 or fewer of facial setae on article 3 of antenna 2 and the apical placement of facial spines on article 4 of antenna 2.

The only so-called brolin with heavily armed rami of uropods 1-2.

See *Basuto*.

**Species.** *Mandibulophoxus gilesi* J.L. Barnard, 1957a (Gray & McCain, 1969) [379]; *M. uncrostratus* (Giles, 1890) (J.L. Barnard, 1957a) (Gray & McCain, 1969) [664].

**Habitat and distribution.** Marine tropical Indo-Pacific and north-eastern Pacific Ocean, sublittoral, 2 species.

*M. gilesi* Barnard & Drummond

Figs 108M, 110H


**Type species.** *Mandibulophoxus gilesi* Barnard & Drummond, 1978, original designation.

**Diagnosis.** Rostrum unconstricted. Eyes present. Article 2 of antenna 1 elongate, ventral setae widely spread or ventral, Article 1 of antenna 2 [not ensiform, article 3 with 12 facial seta], facial spines on article 4 in 1 row, all spines thick, article 5 ordinary. Right mandibular incisor with [13] 4 teeth, right lacinia mobilis bifid, slender, molar not triturative, with 4+ splayed spines; palpal hump small, apex of palp article 3 oblique. Inner plate of maxilla 1 with [70,1,2,3,4,5,6,7] setae, palp 1-articulate, dactyl not strongly protuberant, dactyl elongate, apical nail [?distinct].

Gnathopods similar, weakly enlarged, article 5 free, elongate, without eusirid attachment, palms transverse, propodus broadened, poorly setose anteriorly. Article 5 of gnathopods 3-4 with posteroaxial setae, article 6 with thick armaments. Article 2 of gnathopod 5 of broad form, articles 4-5 of pereopods 5-6 broad to medium; pereopod 7 ordinary, article 3 ordinary, dactyl ordinary.

Epimera 1-2 without long facial brushes but with weak posterior setae, epimeron 3 of ordinary classification, bearing 3 or more long setae. Urosomite 3 without dorsal hook. Peduncle of uropod 1 without inter-ramal spike, without major displaced spine, rami of uropods 1-2 not continuously spinose to apex, without subapical spines or nails, inner ramus of uropod 1 with 1 row of marginal spines. Inner ramus of uropod 2 almost fused to peduncle. Uropod 3 ordinary to minute in female, rami not longer than peduncle, bearing article 2 on outer ramus, with 2 apical setae. Telson ordinary.

**Relationship.** Differing from *Birubius* in the enlarged gnathopods, shortened rami of uropod 3 and loss of mobility on the inner ramus of uropod 2.

See *Kotla*.

**Species.** *Matong matong* Barnard & Drummond, 1978 [784].

**Habitat and distribution.** Marine, Victoria and New South Wales, 8-19 m, 1 species.

*Mesophoxus* Gurjanova


**Type species.** *Mesophoxus laperusi* Gurjanova, 1977, original designation.

**Diagnosis.** Rostrum unconstricted. Eyes tiny. Article 2 of antenna 1 elongate, ventral setae widely spread or ventral, Article 1 of antenna 2 [not ensiform, article 3 with 12 facial setae], facial spines on article 4 in 1 row, all spines thick, article 5 ordinary. Right mandibular incisor with [13] 4 teeth, right lacinia mobilis bifid, slender, molar not triturative, with 3 splayed spines; palpal hump small, apex of palp article 3 oblique. Inner plate of maxilla 1 with [70,1,2,3,4,5,6,7] setae, palp 1-articulate, [probably erroneous], Maxillipeds ordinary, apex of palp article 1 not strongly protuberant, dactyl elongate, apical nail [?distinct].

Gnathopods ordinary, small (but only gnathopod 2 illustrated), article 5 of gnathopods 1-2 short, free, without eusirid attachment, palms oblique, propodus of gnathopods 1-2 ordinary, poorly setose anteriorly. Article 5 of pereopods 3-4 with posteroaxial setae, article 6 with thick armaments. Article 2 of pereopod 5 of broad form but tapering distally, articles 4-5 of pereopods 5-6 medium to narrow; pereopod 7 ordinary, article 3 ordinary, dactyl ordinary.

Epimera 1-2 [?without long facial brushes or ?posterior setae, epimeron 3 of ?ordinary classification or ?bearing 3 or more, fewer long setae. ?Urosomite 3 without dorsal hook.] Peduncle of uropod 1 [?without inter-ramal spike, with ?major displaced spine]
apicolaterally medially, rami of uropods 1-2 ?not continuously spinose to apex, ?without subapical spines or nails, inner ramus of uropod 1 with ?1 2 rows of marginal spines. Inner ramus of uropod 2 ?ordinary ?fused to peduncle. Uropod 3 minute, rami not longer than peduncle, bearing article 2 on outer ramus, with 2 apical setae. Telson ordinary, without supernumerary lateral or dorsal spines.

**Relationship.** Though poorly described there are many elements of the type species showing relationship with *Eyakia*; if the two are synonymous, one assumes *Mesophoxus* would take priority (pending ICZN ruling on date of publication). Coordinate characters are tapering article 2 of pereopod 5, and extra spines on article 4 of antenna 2. Possible generic characters of *Mesophoxus* include the shorter than normal rami of uropod 3, anterior setation of gnathopodal carpus and many more undescribed possibilities.

Differing from *Birubius* in the taper on article 2 of pereopod 5.

**Species.** *Mesophoxus laerusi* Gurjanova, 1977 [284].

**Habitat and distribution.** Marine, Okhotsk Sea between Hokkaido and Sakhalin, 200 m, 1 species.

*Metaphoxoides* Ledoyer


**Type species.** *Metaphoxus picardi* Ledoyer, 1967b, monotypy.

**Diagnosis.** Rostrum unconstricted. Eyes present. Article 2 of antenna 1 short to medium (type) in length, ventral setae almost confined apically. Article 1 of antenna 2 ?not ensiform, article 3 with ?2 facial setules], facial spines on article 4 in 2+ rows, spines thick, article 5 ordinary. Right mandibular incisor with 3 teeth, right lacinia mobilis flabellate, molar not triturative, ?without spines]; palpar hump large, apex of palp article 3 rounded. Inner plate of maxilla 1 without setae, palp 1-articulate. Maxillipedal plates poorly armed, apex of palp article 3 not strongly protuberant, dactyl stubby to elongate, apical nail distinct.

 Gnathopods large, dissimilar, gnathopod 2 moderately enlarged, article 5 of gnathopod 1 free, elongate, on gnathopod 2 short, cryptic, palms transverse to oblique respectively, propodus broadened, poorly setose anteriorly. Article 5 of pereopods 3-4 with posteroproximal setae, article 6 with thick armaments. Article 2 of pereopod 5 of broad form, articles 4-5 of pereopods 5-6 broad to narrow respectively; pereopod 7 ordinary, article 3 and dactyl ordinary.

Epimera 1-2 [?without long facial brushes or posterior setae], epimeron 3 of rounded classification, bearing 3 or fewer long setae. Urosomite 3 [?without dorsal hook]. Peduncle of uropod 1 without inter-ramal spike, without major displaced spine, rami of uropods 1-2 not continuously spinose to apex, inner ramus of uropod 1 without marginal spines. Inner ramus of uropod 2 ordinary. Uropod 3 ordinary, rami longer than peduncle, bearing vestigial article 2 on outer ramus, with 2 apical setae. Telson slightly elongate.

**Additional character.** Absent or vestigial article 2 on outer ramus of uropod 3.

**Relationship.** Distinguished by the reduced or absent article 2 on the outer ramus of uropod 3, with other characters normal. Otherwise like *Metaphoxus* and *Parametaphoxus*.


**Habitat and distribution.** Marine, Madagascar and southern Africa, 0-112 m, 2 and 1 doubtful species.

*Metaphoxus* Bonnier

Fig.109L


**Type species.** *Metaphoxus typicus* Bonnier, 1896 (= *Phoxocephalus pectinatus* Walker, 1896b, = *Phoxus simplex* Bate, 1857d), monotypy.

**Diagnosis.** Rostrum unconstricted. Eyes present. Article 2 of antenna 1 short, ventral setae confined apically. Article 1 of antenna 2 not ensiform, article 3 with 2 facial setules, facial spines on article 4 in 2+ rows, all spines thin, article 5 short. Right mandibular incisor with 3 teeth, right lacinia mobilis bifid, flabellate, molar not triturative, with 1 conical fused spine; palpump small, apex of palp article 3 oblique. Inner plate of maxilla 1 without setae, palp 1-articulate. Maxillipedal plates small, poorly armed, apex of palp article 3 not strongly protuberant, dactyl elongate, apical nail distinct.

Gnathopods large, similar, but gnathopod 2 weakly to strongly enlarged, article 5 of gnathopods 1-2 very short, cryptic, palms oblique, propodus of gnathopods 1-2 ovato-rectangular, elongate or broadened, poorly setose anteriorly. Article 5 of pereopods 3-4 without posteroproximal setae, article 6 with thin armaments. Article 2 of pereopod 5 of broad form, articles 4-5 of pereopods 5-6 narrow; pereopod 7 ordinary, article 3 ordinary, dactyl ordinary.

Epimera 1-2 without long facial brushes or posterior setae, epimeron 3 of rounded classification, bearing 3 or fewer long setae. Urosomite 3 without dorsal hook.
Peduncle of uropod 1 without inter-ramal spike, without major displaced spine, rami of uropods 1-2 not continuously spinose to apex, without subapical spines or nails, inner ramus of uropod 1 with 1 row of marginal spines. Inner ramus of uropod 2 ordinary. Uropod 3 ordinary, one of rami longer than peduncle, bearing article 2 on outer ramus, with 2 medium to vestigial apical setae. Telson ordinary but elongate.

**Relationship.** Differing from *Cephalophoxus* in the weaker molar; from *Phoxocephalus*, *Cephalophoxoides* in the nontriturative molar; from *Parametaphoxus* in the cryptic carpus of gnathopod 1.

See *Rikkarus*.

**Removals.** *Metaphoxus fultonii* Scott, 1890, to *Parametaphoxus*; *M. littoralis* Cooper & Fincham, 1974 to *Ringaringa*.


**Habitat and distribution.** Marine, north-eastern Atlantic, 0-80 m, north-eastern Pacific, 13-458 m, south-eastern Australia, 0-48 m; 5 species.

*Metharpinia* Schellenberg


**Type species.** *Metharpinia longirostris* Schellenberg, 1931, selected by Barnard & Drummond, 1978.

**Diagnosis.** Rostrum constricted. Eyes present. Article 2 of antenna 1 elongate or of medium length, ventral setae proximally placed. Article 1 of antenna 2 not ensiform, article 3 with 2 facial setules, facial spines on article 4 in 2+ rows, all spines thick, article 5 ordinary. Right mandibular incisor with 3 teeth, right lacinia mobilis bifid, thin; molar not triturative, with 4+ splayed spines; palpar hump small, apex of palp article 3 oblique. Inner plate of maxilla 1 with 4 setae, palp 2-articulate. Maxilliped ordinary, apex of palp article 3 not strongly protuberant, dactyl elongate, apical nail distinct. 

Gnathopods ordinary, small, similar, article 5 of gnathopods 1-2 of ordinary length to elongate, free, without eusirid attachment, palms oblique, propodus ordinary, ovato-rectangular, poorly setose anteriorly. Article 5 of pereopods 3-4 with postero-proximal setae, article 6 with thick armaments. Article 2 of pereopod 5 of broad form, articles 4-5 of pereopods 5-6 broad; pereopod 7 ordinary, article 3 ordinary, dactyl ordinary. 

Epimera 1-2 with long posterior setae, epiperon 3 of ordinary classification, bearing 4 or more long setae. Urosomite 3 without dorsal hook, or with weak hump. Peduncle of uropod 1 without inter-ramal spine, with major displaced spine apicomediately, one or more rami of uropods 1-2 continuously spinose to apex, with subapical spines or nails, inner ramus of uropod 1 with 1 row of marginal spines. Inner ramus of uropod 2 ordinary. Uropod 3 ordinary, one of rami longer than peduncle, bearing article 2 on outer ramus, with 2 apical setae. Telson with supernumerary lateral or dorsal setae.

**Relationship.** Characterised by subapical spines or nails on one ramus of uropods 1-2, usually outer ramus of uropod 1 only. Head constricted. Differing from *Rheoxynius* and *Foxiphalus* especially in the uropodal character mentioned. From *Birubius*, *Metharpinia* differs in the supernumerary telsonic setation and displaced spine of uropod 1; from *Parharpinia* and *Protophoxus* in the untapered article 2 of pereopod 5. 

Differing from its ancestral relative, *Phoxorgia*, in the reduced rostrum and loss of apical nails on rami of uropods 1-2, only the subapical components remaining in *Metharpinia*.

See *Microphoxus*.

**Species.** *Metharpinia coronadoi* J.L. Barnard, 1980a [373]; *M. floridana* (Shoemaker, 1933c) (J.L. Barnard, 1960a, 1980a) [362]; *M. jonesii* (J.L. Barnard, 1963, 1980a) [373]; *M. longirostris* Schellenberg, 1931 (J.L. Barnard, 1960a, 1980a) [860]; *M. oripacifica* J.L. Barnard, 1980a [540].

**Habitat and distribution.** Marine, American seas, Magellan to California and South Carolina, 0-43 m, 5 species.

*Microphoxus* J.L. Barnard

Fig.109E


**Type species.** *Microphoxus minimus* J.L. Barnard, 1960a, original designation.

**Diagnosis.** Rostrum constricted to obsolescent. Eyes present. Article 2 of antenna 1 of medium length, ventral setae widely spread. Article 1 of antenna 2 not ensiform, article 3 with 2 facial setules, facial spines on article 4 in 1 or 2+ rows, spines thick, article 5 ordinary. Right mandibular incisor with 3 teeth, right lacinia mobilis bifid, thin, molar not triturative, with 3+ basally fused spines; palpar hump small, apex of palp article 3 oblique. Inner plate of maxilla 1 with 1 or 4 setae, palp 2-articulate. Maxilliped ordinary, apex of palp article 3 not strongly protuberant, dactyl elongate, apical nail
Palabriaphoxus posterior setae on epimera 1-2, displaced medial spine on article 4 in 1 row, all spines thin, article 4 short, article 4 gnathopods 1-2 of ordinary length, free, without eusirid attachment, palms oblique, propodus ordinary, broadened, poorly setose anteriorly. Article 5 of pereopods 3-4 with few posteroproximal setae, article 6 with thin armaments. Article 2 of pereopod 5 of narrow form, articles 4-5 of pereopods 5-6 medium to narrow; pereopod 6 powerful, article 2 with basoposterior cusp; pereopod 7 miniaturised, article 3 slightly enlarged, dactyl ordinary, article 2 grossly toothed.

Epimera 1-2 without long facial brushes or posterior setae, epimeron 3 of ordinary classification, bearing 3 or more long setae. Urosomite 3 with dorsal hook. Peduncle of uropod 1 without inter-ramal spike, without major displaced spine, some rami of uropods 1-2 with subapical spines or nails, inner ramus of uropod 1 with 1 row of marginal spines. Inner ramus of uropod 2 ordinary. Uropod 3 ordinary, one of rami longer than peduncle, bearing article 2 on outer ramus, with 2 apical setae. Telson with supernumerary lateral or dorsal setae.

**Variables.** Microphoxus cornutus with more than 1 row of facial spines on article 4 of antenna 2, more spines on molar (6), 4 setae on inner plate of maxilla 1, long posterior setae on epimera 1-2, displaced medial spine on peduncle of uropod 1.

**Relationship.** Like Metharpinia and Birubius but with strong and sharp dorsal hook on urosomite 3.

**Species.** Microphoxus cornutus (Schellenberg, 1931) (J.L. Barnard, 1960a, 1980a) [864]; M. minimus (J.L. Barnard, 1960a, 1980a) [539].

**Habitat and distribution.** Marine, Magellanic South America and Pacific Costa Rica, 1-15 m, 2 species.

*Palabriaphoxus* Gurjanova


**Type species.** Harpinia palabria J.L. Barnard, 1961b, original designation.

**Diagnosis.** Poorly described. Rostrum unconstricted but complexly extended, geniculate apically. Eyes present. Article 2 of antenna 1 short, asetose. Article 1 of antenna 1 not enisiform, article 3 with 2 facial setules, facial spines on article 4 in 1 row, all spines thin, article 4 short, article 5 ordinary. Right mandibular incisor with [?3 4 teeth, right lacinia mobilis bifid, simple, flabellate, absent], molar not triturative, with [?3 4 +?, basally fused? splayed spines]; palp par hump [?small, apex of palp article 3 ?oblique, ?truncate. Inner plate of maxilla 1 with 20,1,2,3,4,5,6,7 setae, palp ?2-articulate. Maxillipeds ?ordinary, ?inner plates partly fused, ?setation, apex of palp? article 3 not strongly protuberant, dactyl ?not elongate, apical nail ?distinct].

Gnathopods ordinary, small, alike, article 5 on gnathopods 1-2 of ordinary length, free, without eusirid attachment, palms oblique, propodus ordinary, broadened, poorly setose anteriorly. Article 5 of pereopods 3-4 with few posteroproximal setae, article 6 with thin armaments. Article 2 of pereopod 5 of narrow form, articles 4-5 of pereopods 5-6 medium to narrow; pereopod 6 powerful, article 2 with basoposterior cusp; pereopod 7 miniaturised, article 3 slightly enlarged, dactyl ordinary, article 2 grossly toothed.

Epimera 1-2 without long facial brushes, posterior setae sparse, epimeron 3 of ordinary classification. Urosomite 3 without dorsal hook. Peduncle of uropod 1 without inter-ramal spike, with major displaced spine apicolaterally, some rami of uropods 1-2 continuously spinose to apex, with apical spines, inner ramus of uropod 1 with 1 row of marginal spines. Inner ramus of uropod 2 ordinary. Uropod 3 ordinary, rami longer than peduncle, bearing article 2 on outer ramus, with 2 apical setae. Telson ordinary, with supernumerary lateral or dorsal setae.

**Relationship.** Differing from other harpiniins in the powerful pereopod 6 with articles 4-6 thickened; otherwise close to *Pseudharpinia*.

**Species.** Palabriaphoxus palabria (J.L. Barnard, 1961b) [715B].

**Habitat and distribution.** Marine, Tasman Sea, 610 m, 1 species.

*Parajoubinella* Gurjanova

*Parajoubinella* Gurjanova, 1977: 82.

**Type species.** Parajoubinella concinna Gurjanova, 1977, original designation.

**Diagnosis.** Rostrum unconstricted but complexly extended, geniculate apically. Eyes present. Article 2 of antenna 1 short, asetose. Article 1 of antenna 2 not enisiform, article 3 with [?2 facial setules], facial spines on article 4 in 2+ rows, [?all spines thick or ?some spines thin], article 5 ordinary. Right mandibular incisor [?absent], right lacinia mobilis [?absent], molar not triturative [new observation fide R.J. Lincoln]; palp par hump small; apex of palp article 3 oblique. Inner plate of maxilla 1 without setae, palp 1-articulate. Maxillipeds ordinary, plates large, apex of palp article 3 not protuberant, dactyl elongate, apical nail distinct.

Gnathopods small, dissimilar, gnathopod 1 weakly to moderately elongate, article 5 of gnathopods 1-2 free, elongate only on gnathopod 1, with eusirid attachment, palms transverse to chelate, propodis of gnathopods 1-2 rectangular, slightly broadened, poorly setose anteriorly. Article 5 of pereopods 3-4 without posteroproximal setae, article 6 with thick armaments. Article 2 of pereopod 5 of broad form, articles 4-5 of pereopods 5-6 medium to narrow; pereopod 7 ordinary, article 3 ordinary, dactyl ordinary.
Epipera 1-2 ['?without long facial brushes or posterior setae, epimeron 3 ?bearing 3 or more fewer long setae. Urosomite 3 ?without dorsal hook]. Peduncle of uropod 1 without inter-ramal spike, without major displaced spine, rami of uropods 1-2 not continuously spinose to apex, without subapical spines or nails, inner ramus of uropod 1 with 1 row of marginal spines. Inner ramus of uropod 2 ordinary. Uropod 3 ordinary, outer rami much longer than peduncle, bearing article 2, with 4 apical setae. Telson with supernumerary lateral spines.

**Relationship.** As represented in figures of Gurjanova, differing from *Phoxocephalus, Cephalophoxus*, and *Cephalophoxoides* in the elongate carpus of the gnathopods; from *Leptophoxus* in the unproduced palp article 3 on the maxillipeds; from *Uldanamia* in the small palp harp of the mandible and presence of more than 2 setae on article 2 of the outer rami on uropod 3, the untoothed epimeron 3, the well-developed dactyls of pereopods 3-4, but especially the poor development of gnathopodal chelae; from *Diogodias* in the supernumerary telsonic spination and elongate carpus of gnathopod 2; and from all other genera in the odd rostrum.

See *Diogodias* and *Ringaringa*.

**Species.** Parajoubinella concinna Gurjanova, 1977 [775].

**Habitat and distribution.** Marine, New Zealand, shallow water, 1 species.

*Paramesophoxus* Gurjanova

*Paramesophoxus* Gurjanova, 1977: 76.

**Type species.** *Paramesophoxus racunae* Gurjanova, 1977, original designation.

**Diagnosis.** Poorly described. Rostrum unconstricted. Eyes present. Article 2 of antenna 1 short, ventral setae almost confined apically. Article 1 of antenna 2 not ensiform, article 3 with [?2 facial setules], facial spines on article 4 in 1 row, plus rudimentary row, most spines thick, some spines thin, article 5 short. Right mandibular incisor with 3 teeth, right lacinia mobilis flabellate, molar not triturative, with 3 basally fused spines; palp harp small, apex of palp article 3 oblique. Inner plate of maxilla 1 with 1 seta, palp 1-articulate. Maxillipedes ['?ordinary, ?inner plates partly fused, ?setation, ?apex of palp article 3 not strongly protuberant], dactyl elongate, apical nail distinct.

Gnathopods ordinary, small, [?dissimilar, gnathopod 2 weakly to moderately to strongly enlarged], article 5 of gnathopods 1-2 of ordinary length, free, without eusirid attachment, palms oblique, propodus of gnathopods 1-2 ordinary to elongate, poorly setose anteriorly. Article 5 of pereopods 3-4 without posteroproximal setae, article 6 with thick armaments. Article 2 of pereopod 5 of broad form, articles 4-5 of pereopods 5-6 medium to narrow; pereopod 7 ordinary, article 3 slightly enlarged, dactyl ordinary.


**Relationship.** The type species of this genus is poorly described and we leave it open for future work but believe this genus differs from *Paraphoxus* only by the lack of the juncture line between articles 1 and 2 of the palp on maxilla 1. This is scarcely adequate to distinguish the genus.

**Species.** *Paramesophoxus racunae* Gurjanova, 1977 [391].

**Habitat and distribution.** Marine, northern Japan Sea, depth unknown, 1 species.

*Parametaphoxus* Gurjanova


**Type species.** *Phoxocephalus fultoni* Scott, 1890, original designation.

**Diagnosis.** Rostrum unconstricted. Eyes present. Article 2 of antenna 1 of medium length, ventral setae confined apically. Article 1 of antenna 2 not ensiform, article 3 with [?2 facial setules], facial spines on article 4 in 1 row, all spines thin, article 5 ordinary. Right mandibular incisor with [?3 4 teeth, right lacinia mobilis ?bifid, ?simple, ?flabellate, ?absent,] molar not triturative, with 1 basally fused spine; palp harp small, apex of palp article 3 oblique. Inner plate of maxilla 1 without setae, palp 1-articulate. Maxillipedal plates small, poorly armed, apex of palp article 3 not strongly protuberant, dactyl elongate, apical nail distinct.

Gnathopods enlarged, dissimilar, gnathopod 2 weakly larger than 1, article 5 of gnathopod 1 short, scarcely free, of gnathopod 2 very short and cryptic, palms transverse-chelate to oblique respectively, propodus of gnathopods 1-2 elongate, broadened, poorly setose anteriorly. Article 5 of pereopods 3-4 without posteroproximal setae, article 6 with thin armaments.
Article 2 of pereopod 5 broad, pyriform, articles 4-5 of pereopods 5-6 narrow; pereopod 7 ordinary, article 3 ordinary, dactyl ordinary.

Epimera 1-2 without long facial brushes or posterior setae, epimeron 3 of rounded classification, bearing 3 or fewer long setae. Urosomite 3 without dorsal hook. Peduncle of uropod 1 without inter-ramal spike, without major displaced spine, rami of uropods 1-2 not continuously spinose to apex, without subapical spines or nails, inner ramus of uropod 1 with 1 (or no) row of marginal spines. Inner ramus of uropod 2 ordinary. Uropod 3 ordinary, one of rami longer than peduncle, bearing article 2 on outer ramus, with 0-2 apical setae (variable by sex, etc.) Telson elongate.

Additional characters. Aberrances: inner plate of maxilla 1 setose (P. tulearensis, see Ledoyer, 1967); article 6 of pereopods 3-4 with thick elements (P. tulearensis).

Relationship. Differing from Metaphoxus in the free carpus of gnathopod 1 and the transverse to chelate palms of the gnathopods; from Phoxocephalus in the well-developed gnathopods with cryptic carpus on gnathopod 2 and chelate propodus.


Habitat and distribution. Marine, eastern Atlantic, England to Adriatic, eastern Pacific, mid-California to Baja California, Madagascar, 0-170 m, 2 species.

Paraphoxus Sars
Fig.108F


Type species. Phoxus oculatus Sars, 1879, monotypy.

Diagnosis. Rostrum unconstricted. Eyes present. Article 2 of antenna 1 short, ventral setae almost confined apically. Article 1 of antenna 2 not enisiform, article 3 with 2 facial setules, facial spines on article 4 in 1 row, plus rudimentary row, some spines thick, some spines thin, article 5 short. Right mandibular incisor with 3 teeth, right lacinia mobilis bifid, flabellate; molar not triturative, with 3 basally fused spines; palpar hump small, apex of palp article 3 oblique. Inner plate of maxilla 1 with 2 setae, palp 2-articulate. Maxillipeds ordinary, apex of palp article 3 not strongly protuberant, dactyl elongate, apical nail distinct.

Gnathopods ordinary, small, gnathopod 2 weakly enlarged, article 5 of gnathopod 1 of ordinary length, free, without eusirid attachment, of gnathopod 2 shorter and almost cryptic, palms oblique, propod of gnathopods 1-2 ordinary, poorly setose anteriorly. Article 5 of pereopods 3-4 with posteroproximal setae, article 6 with thin armaments. Article 2 of pereopod 5 of broad form, articles 4-5 of pereopods 5-6 medium to narrow; pereopod 7 ordinary, article 3 ordinary, dactyl ordinary.

Epimera 1-2 without long facial brushes or posterior setae, epimeron 3 of rounded classification, bearing 3 or fewer long setae. Urosomite 3 without dorsal hook. Peduncle of uropod 1 without inter-ramal spike, without major displaced spine, rami of uropods 1-2 not continuously spinose to apex, without subapical spines or nails, inner ramus of uropod 1 with 1 row of marginal spines. Inner ramus of uropod 2 ordinary. Uropod 3 ordinary, rami longer than peduncle, bearing article 2 on outer ramus, with 2 apical setae. Telson ordinary, without supernumerary lateral or dorsal spines.

Relationship. An ordinary brolgin, differing from Kuritus, Elpeddo and Wildus in the loss of displaced spine on the peduncle of uropod 1; from Brolgus and Ganba in the presence of 2 (versus 1) setae on article 2 of the outer ramus on uropod 3.

See Eobrolgus and Eyakia.

Species. See also list of species to be allocated to new genera at terminus of this family; P. oculatus (Sars, 1879) (= P. maculatus Chevreux, 1888b) (Sars, 1895) (Chevreux & Fage, 1925) (Karaman 1973a) [210 + AB]; P. simplex Gurjanova, 1938b; 1951 [391].

Habitat and distribution. Marine, North Atlantic and North Pacific Oceans, 27-2800 m, 2 species.

Parharpinia Stebbing
Figs 109M, 110C


Type species. Phoxus villosus Haswell, 1879a, original designation.

Diagnosis. Rostrum variable. Eyes present. Article 2 of antenna 1 of medium length, ventral setae widely spread. Article 1 of antenna 2 scarcely enisiform, article 3 with 2 facial setules, facial spines on article 4 in 1, or rarely 2+ rows, all spines thick, article 5 ordinary. Right mandibular incisor with 3 teeth, right lacinia mobilis bifid, molar not triturative, with 4+ splayed spines; palpar hump small, apex of palp article 3 oblique. Inner plate of maxilla 1 with 4 setae, palp 2-articulate. Maxillipeds ordinary, apex of palp article 3 not strongly protuberant,
dactyl elongate, apical nail distinct.

Gnathopods ordinary, small, similar, article 5 of gnathopods 1-2 of ordinary length, free, without eusirid attachment, palms oblique, propodus of gnathopods 1-2 ordinary, thinly ovatorectangular, poorly setose anteriorly. Article 5 of pereopods 3-4 with postero-proximal setae, article 6 with thick armaments. Article 2 of pereopod 5 of broad form, but tapering distally, articles 4-5 of pereopods 5-6 narrow; pereopod 7 ordinary, article 3 ordinary, dactyl ordinary.

Epimera 1-2 without facial brushes, but with posterior setae, epimeron 3 of ordinary classification, bearing 3 or more long setae. Urosomite 3 without dorsal hook. Peduncle of uropod 1 without inter-ramal spike, with major displaced spine apicomedially, rami of uropods 1-2 not continuously spinose to apex, without subapical spines, inner ramus of uropod 1 with 1 row of marginal spines. Inner ramus of uropod 2 ordinary. Uropod 3 ordinary, one of rami longer than peduncle, bearing article 2 on outer ramus, with 2-4 apical setae. Telson with supernumerary lateral or dorsal spines or setae.

Special character. Article 2 of pereopod 7 setose ventrally.

Relationship. Differing from Eobrolgus in (1) the accessory telsonic armament; (2) posteriorly setose epimera 1-2; (3) wide spread of ventral setae on article 2 of antenna 1; and (4) the displaced spine of uropod 1. From Birubius, Parharpinia differs in items 1, 2 and 4 plus (5) tapering article 2 of pereopod 5; and (6) short article 2 of antenna 1.

Parharpinia is very close to Foxiphalus but differs in the poorly ensiform antenna 2 and tapering article 2 of pereopod 5.

See Eyakia and Protophoxus.


Species. See also list of species of unknown generic assignment at terminus of this family; P. villosa (Haswell, 1879a) (Barnard & Drummond, 1978) [780]; P. warte Barnard & Drummond, 1978 [786].

Habitat and distribution. Marine, Australia from New South Wales to Great Australian Bight, 8-145 m, 2 species.

Phoxocephalus Stebbing

Figs 108B, 110B, 111B

Phoxus Kroyer, 1842: 150 [homonym, Coleoptera] (Phoxus holboli Kroyer, 1842, selected by Boeck, 1876).

Spinifer Kroyer, 1842: 151 [homonym, Mollusca] (Phoxus holboli Kroyer, 1842, here selected).


Type species. Phoxus holboli Kroyer, 1842, selected by Boeck, 1876.

Diagnosis. Rostrum unconstricted. Eyes vestigial or absent. Article 2 of antenna 1 short or of medium length, ventral setae confined apically. Article 1 of antenna 2 not ensiform, article 3 with 2 facial setules, facial spines on article 4 in 2 rows, some spines thick, some spines thin, article 5 short. Right mandibular incisor with 3 teeth, right lacinia mobilis bifid, flabellate, molar triturative; palpal humap small, apex of palp article 3 oblique. Inner plate of maxilla 1 without setae, pap 1-articulate. Maxillipeds ordinary, apex of palp article 3 not strongly protuberant, dactyl elongate, apical nail distinct.

Gnathopods ordinary, small, similar, article 5 of gnathopod 1 of ordinary length, of gnathopod 2 very short, first free, second almost cryptic, palms oblique, propodus of gnathopods 1-2 ordinary, ovatorectangular, poorly setose anteriorly. Article 5 of pereopods 3-4 with postero-proximal setae, article 6 with thin armaments. Article 2 of pereopod 5 of broad form, but tapering distally, articles 4-5 of pereopods 5-6 narrow; pereopod 7 ordinary, article 3 ordinary, dactyl ordinary.

Epimera 1-2 without long facial brushes or posterior setae, epimeron 3 bearing 3 or fewer long setae. Urosomite 3 without dorsal hook. Peduncle of uropod 1 without inter-ramal spike, with major displaced spine apicomedially, rami of uropods 1-2 not continuously spinose to apex, inner ramus of uropod 1 with 1 row of marginal spines. Inner ramus of uropod 2 ordinary. Uropod 3 ordinary, one of rami longer than peduncle, bearing article 2 on outer ramus, with 2-4 apical setae. Telson with supernumerary lateral or dorsal spines or setae.

Relationship. Differing from other triturative phoxocephalin genera such as Cephalophoxus, Cephalophoxoides, Parajoubinella and Eusyrophoxus in the very weak gnathopods with short free carpus (though carpus of gnathopod 2 tending to become cryptic).

See Synphoxus.


Species. See also list of species of unknown generic assignment at terminus of this family; P. holboli (Kroyer, 1842) (= P. kroyeri Stimpson, 1853) (Sars, 1895) (J.L. Barnard, 1960a) [216 + B].

Habitat and distribution. Marine, cold North Atlantic and adjacent Arctic south to 40°, 0-190 m, 1 species.
Phoxorgia Barnard & Barnard


Type species. Parharpinia sinuata K.H. Barnard, 1932, original designation.

Diagnosis. Rostrum weakly constricted. Eyes present. Article 2 of antenna 1 short, ventral setae almost confined apically. Article 1 of antenna 2 not ensiform, article 3 with 3 facial setules, facial spines on article 4 in 2+ rows, all spines thick, article 5 ordinary. Right mandibular incisor with 3 teeth, right lacinia mobilis bifid, subflabellate, molar not triturative, with 4+ splayed spines; palpal hump small, apex of palpal article 3 oblique. Inner plate of maxilla 1 with 4 setae, palp 2-articulate. Maxillipeds ordinary, apex of palp article 3 not strongly protuberant, dactyl elongate, apical nail distinct.

Gnathopods ordinary, small, similar, article 5 of ordinary length to elongate, free, palms transverse, propodus ovatoretangular, slightly broadened, poorly setose anteriorly. Article 5 of pereopods 3-4 with postero proximal setae, article 6 with thick armanents. Article 2 of pereopod 5 of broad form, scarcely tapering distally, articles 4-5 of pereopods 5-6 narrow; pereopod 7 ordinary, article 3 ordinary, dactyl ordinary.

Epimera 1-2 without long facial brushes or posterior setae, epimeron 3 of ordinary classification, bearing 4 or more long setae. Urosomite 3 without dorsal hook. Peduncle of uropod 1 without inter-ramal spike, with major displaced spine apicomodelad, some rami of uropods 1-2 with subapical spines or nails, inner ramus of uropod 1 with 1 row of marginal spines. Inner ramus of uropod 2 ordinary. Uropod 3 ordinary, one of rami longer than peduncle, bearing article 2 on outer ramus, with 2 apical setae. Telson ordinary or with weakly supernumerary lateral or dorsal spines.

Relationship. Like Parharpinia but ventral setae on article 2 of antenna 1 shifted apically, posterior setation on epimera 1-2 poor, ventral setae on article 2 of pereopod 7 lacking and true dorsal setae on telson lacking.

Differing from Birubius in the displaced spine of uropod 1.

Very close to but differing from Elpeddo in the slightly tapering head, thick spines on inner plate of maxilliped, 2 (versus 1) rows of spines on article 4 of antenna 2, more than 3 spines on the molar, almost continuous spination on the rami of uropods 1-2, and the weakly developed lateral spines on the telson.

See Metharpinia.

Species. Phoxorgia sinuata (K.H. Barnard, 1932) (J.L. Barnard, 1960a) [867].

Habitat and distribution. Marine, South America from Valparaiso south-eastward to South Georgia, 4-159 m, 1 species.
Species. See J.L. Barnard, 1960a; *P. antipoda* Schellenberg, 1931 [866]; *P. setifera* Ledoyer, 1986 [618B]; *P. stephensi* Schellenberg, 1931 [866].

**Habitat and distribution.** Marine, Magellan area, Falkland Islands, and near Madagascar, 2-450 m, 3 species.

*Protophoxus* K.H. Barnard


**Diagnosis.** Rostrum unconstricted. Eyes present. Article 2 of antenna 1 short, ventral setae widely spread. Article 1 of antenna 2 not ensiform, article 3 with 2 facial setules, facial spines on article 4 in 1 main row, all spines thick, article 5 ordinary. Right mandibular incisor with 3 main teeth, right lacinia mobilis bifid, thin, molar not triturative, with 4+ splayed spines; palpal hump medium, apex of palp article 3 oblique. Inner plate of maxilla 1 with 4 setae, palp 2-articulate. Maxillipeds ordinary, apex of palp article 3 not strongly protuberant, dactyl elongate, apical nail distinct.

Gnathopods ordinary, small, similar, article 5 of gnathopods 1-2 of ordinary length to weakly elongate, free, without eusirid attachment, palms oblique, propodus ordinary, ovatorectangular, poorly setose anteriorly. Article 5 of pereopods 3-4 with posteroproximal setae, article 6 with thick armaments. Article 2 of pereopod 5 of broad form but tapering distally, articles 4-5 of pereopods 5-6 medium to narrow: pereopod 7 ordinary, article 3 ordinary, dactyl ordinary.

Epimera 1-2 with facial brushes but no posterior setae, epimeron 3 of ordinary classification, bearing 4 or more long setae in facial row. Urosome 3 without dorsal hook. Peduncle of uropod 1 without inter-ramal spike, with major displaced spine apicolaterally, rami of uropods 1-2 not continuously spinose to apex, without subapical spines or nails, inner ramus of uropod 1 with 1 row of marginal spines. Inner ramus of uropod 2 ordinary. Uropod 3 ordinary, one of rami longer than peduncle, bearing article 2 on outer ramus, with 2 apical setae. Telson with supernumerary lateral or dorsal spines.

**Additional character.** Article 2 of pereopod 7 lacking ventral setae.

**Relationship.** Like Parharpinia but displaced spine of uropod 1 in lateral position, article 2 of pereopod 7 lacking ventral setosity, and epimera 1-2 lacking posterior setosity.


**Habitat and distribution.** Marine, New Zealand, New Caledonia, neritic, intertidal to 37 m, 1 species.

*Pseudharpinia* Schellenberg


Type species. *Pseudharpinia dentata* Schellenberg, 1931, monotypy.

**Diagnosis.** Rostrum unconstricted. Eyes absent. Article 2 of antenna 1 short, ventral setae widely spread. Article 1 of antenna 2 ensiform, article 3 with several facial setules, facial spines on article 4 in 1 or weakly 2 rows, spines mostly thin, article 5 very short. Right mandibular incisor with [4 teeth, right lacinia mobilis bifid, flabellate], molar not triturative, with 4+ splayed spines; palpal hump small, apex of palp article 3 oblique. Inner plate of maxilla 1 with 2 setae, palp 2-articulate. Maxillipeds ordinary, apex of palp article 3 not strongly protuberant, dactyl stubby, apical nail distinct.

Gnathopods ordinary, small, similar, gnathopod 2 weakly enlarged, article 5 of gnathopods 1-2 short, free, palms oblique, propodus of gnathopods 1-2 thin, ovatorectangular, poorly setose anteriorly. Article 5 of pereopods 3-4 with posteroproximal setae, article 6 with [4 thin] armaments. Article 2 of pereopod 5 of narrow form, articles 4-5 of pereopods 5-6 narrow: pereopod 7 of ordinary size, article 3 enlarged, dactyl ordinary.

Epimera 1-2 without long facial brushes or posterior setae, epimeron 3 of ordinary classification, bearing 3 or more long setae in facial row. Urosome 3 without dorsal hook. Peduncle of uropod 1 without inter-ramal spike, with major displaced spine, some rami of uropods 1-2 continuously spinose to apex, with subapical spines or nails, inner ramus of uropod 2 often with 2 rows of marginal spines. Inner ramus of uropod 2 ordinary. Uropod 3 ordinary, one of rami longer than peduncle, bearing article 2 on outer ramus, with 2 apical setae. Telson ordinary or with supernumerary lateral or dorsal spines.

**Variables.** Medial spination on peduncles of uropods 1-2 widely spread (*P. excavata*); antenna 2 poorly ensiform (*P. ayutlanta, P. cinca*); maxillipedal palp with elongate dactyl (*P. abyssalis, P. obtusifrons*).

**Relationship.** Differing from *Heterophoxus* in the loss of eyes; from *Harpiniopsis* in the one or more of the continuously spinose rami on uropods 1-2 and the more strongly ensiform antenna 2.
Removal. *Pseudharpinia latipes* Norman, 1900c, to *Harpinia*.

**Species.** See Bushueva (1982, key); *P. abyssalis* (Pirot, 1932b) [640AB]; *P. a. productus* J.L. Barnard, 1964c [501A]; *P. ayalantia* (J.L. Barnard, 1964a) [501B]; *P. birjulina* (Gurnjeva, 1953) [286B]; *P. breviprostris* (Chevreux, 1920, 1927) (?Ledy, 1986) [330B + 7694A]; *P. calcariosa* Bushueva, 1982 [811BA]; *P. cariniceps* (K.H. Barnard, 1932) [875 + B]; *P. cinca* (J.L. Barnard, 1961a, 1962d) [735AB]; *P. dentata* Schellenberg, 1931 [864]; *P. excavata* (Chevreux, 1887c, 1900a) (=*P. sanpedroensis* J.L. Barnard, 1960a) (J.L. Barnard, 1967a) [423AB]; *P. latipes* (Norman, 1900c) (Chevreux, 1927) (see *Harpinia* [350B]; *P. obtusifrons* (Stebbing, 1888) (Bellan-Santini & Ledy, 1974) [880]; *P. vallini* (Dahl, 1954) [804B].

**Habitat and distribution.** Marine, cosmopolitan cold water, mostly deep, 15-6328 m, 12 species.

*Rheopyxinius* J.L. Barnard


**Type species.** *Pseudharpinia epistoma* Shoemaker, 1938a, original designation.

**Diagnosis.** Rostrum constricted. Eyes present. Article 2 of antenna 1 elongate to medium, ventral setae widely to narrowly spread. Article 1 of antenna 2 weakly ensiform, article 3 with 2 facial setules, facial spines on article 4 in 2+ rows, all spines thick, article 5 ordinary. Right mandibular incisor with 3 teeth, right lacina mobilis bifid or simple, thin, molar not triturative, with 4+ spayed spines; palpal hump small, apex of palpal article 3 oblique. Inner plate of maxilla 1 with setae, palp 2-articulate. Maxillipedes ordinary, apex of palpal article 3 not strongly protubent, dactyl elongate, apical nail distinct, often weak.

Gnathopods ordinary, small, similar, article 5 of gnathopods 1-2 of ordinary length to elongate, free, without eusirid attachment, palms oblique to transverse, propodus of gnathopods 1-2 ordinary to thin and elongate, poorly setose anteriorly, occasionally trichopoxin in shape. Article 5 of pereopods 3-4 with postero-axillary setae, article 6 with thick armaments. Article 2 of pereopod 5 of broad form, articles 4-5 of pereopods 5-6 broad to medium; pereopod 7 ordinary, article 3 ordinary, dactyl ordinary.

Epimeron 1-2 without long facial spines or posterior setae, epimeron 3 of ordinary classification, bearing 3 or more long setae. Urosomite 3 without dorsal hook. Peduncle of uropod 1 without inter-ramal spike, with major displaced spine apicomically or not, rami of uropods 1-2 not continuously spinose to apex, without subapical spines or nails, inner rami of uropod 1 with 1 row of marginal spines. Inner rami of uropod 2 ordinary. Uropod 3 ordinary, one of rami longer than peduncle, bearing article 2 on outer ramus, with 2 apical setae. Telson ordinary.

**Relationship.** Differing from *Birubius* in the ensiform antenna 2, from *Foxiphalus* in the constricted rostrum, and from *Grandifexus* in the presence of only 2 facial setules on article 3 of antenna 2 and the absence of cusps on coxae 1-3.


**Habitat and distribution.** Marine, both coasts of North America, boreal and warm-temperate, 0-813 m, 15 species.

*Rikkurus* Barnard & Drummond


**Type species.** *Rikkurus lea* Barnard & Drummond, 1978, original designation.

**Diagnosis.** Rostrum unconstricted. Eyes present. Article 2 of antenna 1 short, ventral setae confined apically. Article 1 of antenna 2 not ensiform, article 3 with 2 facial setules, facial spines on article 4 in 1 row, spines thin, article 5 ordinary. Right mandibular incisor with 3 teeth, right lacina mobilis bifid, filabellate, molar not triturative, with 1-9 spayed spines, one of these large, elongate; palpal hump medium to large, apex of palpal article 3 oblique. Inner plate of maxilla 1 without setae, palp 1-articulate. Maxillipedes small, poorly armed, apex of palp article 3 not strongly protuberant, dactyl elongate, apical nail distinct.

Gnathopods similar, moderately enlarged, article 5 very short, cryptic, palms oblique, propodus thin, ovato-rectangular, elongate, poorly setose anteriorly. Article 5 of pereopods 3-4 with postero-axillary setae, article 6 with thin armaments. Article 2 of pereopod 5 of broad form, articles 4-5 of pereopods 5-6 narrow; pereopod 7 ordinary, article 3 ordinary, dactyl
ordinary.

Epipimeron 1-2 without facial brushes or posterior setae, epipimeron 3 of rounded classification, bearing 3 or fewer long setae but deeply serrate. Urosomite 3 without dorsal hook. Peduncle of uropod 1 without inter-ramal spike, without major displaced spine, rami of uropods 1-2 not continuously spinose to apex, inner rami of uropod 1 without marginal spines. Inner rami of uropod 2 ordinary. Uropod 3 ordinary, rami longer than peduncle, bearing article 2 on outer rami, with 2 small apical setae. Telson elongate.

**Relationship.** Like *Metaphoxus* but epipimeron 3 grossly serrate.

**Species.** *Rikkarus lea* Barnard & Drummond, 1978 [781].

**Habitat and distribution.** Marine, New South Wales, 66 m, 1 species.

*Ringaringa* n.gen.

**Type species.** *Metaphoxus littoralis* Cooper & Fincham, 1974, here selected.

**Etymology.** From the type locality, Ringaringa Beach.

**Diagnosis.** Rostrum unconstricted, very long, with apical spike. Eyes present. Article 2 of antenna 1 short, ventral setae confined apically. Article 1 of antenna 2 moderately ensiform, article 3 with [?]2] facial setules, facial spines on article 4 in 1 row, all spines thick, article 5 ordinary. Right mandibular incisor with 3 teeth, right lacinia mobilis small but flabellate, molar simple, with 3 stout spines; palpar hump [?]small, apex of palpar article 3 oblique. Inner plate of maxilla 1 without setae, palp 1-articulate. Maxillipedal inner plates not fused, apex of palp article 3 not protuberant, dactyl elongate, apical nail distinct.

Gnathopods similar, gnathopod 2 moderately to strongly enlarged, gnathopod 1 moderately enlarged, article 5 of gnathopods 1-2 elongate, not lobed, palms transverse, propodus of gnathopods 1-2 slightly elongate and broadened, poorly setose anteriorly. Article 5 of pereopods 3-4 with postero-proximal setae, article 6 with thick armaments. Article 2 of pereopod 5 of broad form, articles 4-5 of pereopods 5-6 medium to narrow; pereopod 7 ordinary, article 3 ordinary, dactyl ordinary.

Epipimeron 1-2 without long posterior setae, epipimeron 3 of rounded-glabrous classification, bearing 3 or fewer long setae. Urosomite 3 without dorsal hook. Peduncle of uropod 1 without inter-ramal spike, without major displaced spine, rami of uropods 1-2 not continuously spinose to apex, without subapical spines or nails, inner rami of uropod 1 with 1 row of marginal spines.

**Relationship.** Like *Diogodias* but carpus of gnathopod 2 elongate; like *Parajoubinella* but carpus of gnathopod 2 elongate and telson lacking supernumerary lateral spines.

**Species.** *Ringaringa littoralis* (Cooper & Fincham, 1974) [776].

**Habitat and distribution.** Marine, New Zealand, Stewart Island, intertidal sand, 1 species.

*Synphoxus* Gurjanova

*Synphoxus* Gurjanova, 1980a: 95.

**Type species.** *Synphoxus novaezelandicus* Gurjanova, 1980a, original designation.

**Diagnosis.** Poorly described. Rostrum obsolescent, head broad apically. Eyes present. Article 2 of antenna 1 short or of medium length (figures vary), sparse ventral setae widely spread. Article 1 of antenna 2 not ensiform, article 3 with [?]2] facial setules, facial spines on article 4 in 2+ rows, all spines thick, article 5 short. Right mandibular incisor with [?]4] teeth, right lacinia mobilis [?]bifid, simple, flabellate, absent], molar weakly triturative; palpar hump large, apex of palp article 3 [?]oblique]. Inner plate of maxilla 1 with setae, outer with 4 spines, palp [?]articulate]. Maxillipeds [?]ordinary, apex of palp article 3 not strongly protuberant, dactyl elongate, apical nail distinct.

Gnathopods small, similar, article 5 of gnathopods 1-2 free, elongate, without eusirid attachment, palms almost transverse, propodus rectangular, poorly squose anteriorly. Article 5 of pereopods 3-4 with postero-proximal setae, article 6 with thick armaments. Article 2 of pereopod 5 of broad form, articles 4-5 of pereopods 5-6 broad; pereopod 7 of ordinary size, article 3 slightly enlarged, dactyl vestigial.

Epipimeron 1-2 [?]without long facial brushes or posterior setae, epipimeron 3 of rounded classification, bearing 3 or fewer long setae. Urosomite 3 [?]without dorsal hook]. Peduncle of uropod 1 without inter-ramal spike, without major displaced spine, rami of uropods 1-2 not continuously spinose to apex, with 4 apical setae. Telson elongate.

**Special character.** Article 6 of pereopod 7 puffy and poorly armed; some spines on uropod 1 giant.
**Relationship.** Differing from *Yannmacoona* in the elongate article 2 on the outer ramus of uropod 3 and the free elongate carpus of gnathopod 2. Differing from *phoxocephalins* in the obsolete rostrum, large palpar hump of the mandible and puffy poorly armed article 6 of pereopod 7.

**Species.** *Synphoxus novaemailandicus* Gurjanova, 1986a [775].

**Habitat and distribution.** Marine, New Zealand, 0 m, 1 species.

**Tickalerus** Barnard & Drummond


**Type species.** *Tickalerus birubi* Barnard & Drummond, 1978, original designation.

**Diagnosis.** Rostrum constricted. Eyes present. Article 2 of antenna 1 elongate, ventral setae narrowly spread. Article 1 of antenna 2 not ensiform, article 3 with 2 facial setules, facial spines on article 4 in 4+2 rows, all spines thick, article 5 ordinary. Right mandibular incisor with 3 teeth, right lacinia mobilis bifid, flabellate, molar not triturative, with 4+ splayed spines; palpal hump small, apex of palp article 3 oblique. Inner plate of maxilla 1 with 4 setae, palp 2-articulate. Maxillipeds ordinary, apex of palp article 3 protuberant, dactyl elongate, apical nail distinct.

Gnathopods ordinary, small, similar, gnathopod 2 weakly enlarged, article 5 of gnathopods 1-2 of ordinary length, free, without eusirid attachment, palms oblique, propodus of gnathopods 1-2 ordinary, ovatorectangular, poorly setose anteriorly. Article 5 of pereopods 3-4 with posteroproximal setae, article 6 with thick armaments. Article 2 of pereopod 5 of broad form, articles 4-5 of pereopods 5-6 broad; pereopod 7 ordinary, article ordinary, dactyl ordinary.

Epimeron 1-2 with many facial but no posterior setae, epimeron 3 of ordinary classification, bearing 3 or more long setae. Urosomite 3 with dorsal hook. Peduncle of uropod 1 without inter-ramal spike, without major displaced spine, rami of uropods 1-2 not continuously spinose to apex, inner ramus of uropod 1 with 1 row of marginal spines. Inner ramus of uropod 2 ordinary. Uropod 3 small, rami scarcely longer than peduncle, bearing article 2 on outer ramus, with 2 apical setae. Telson ordinary.

**Special character.** Article 4 of female antenna 2 with 2 or more sets of well-developed dorsal setae.

**Relationship.** Like *Birubius* but with well-developed dorsal setation on article 4 of female antenna 2 (rudimentary in a few species of *Birubius*), with dorsal process on urosomite 3 and the short rami of uropod 3 (some species of *Birubius* with slightly shortened rami). See *Kulaphoxus*.

**Species.** *Tickalerus birubi* Barnard & Drummond, 1978 [782].

**Habitat and distribution.** Marine, Victoria, 9-11 m, 1 species.

**Tipimegus** Barnard & Drummond

*Tipimegus* Barnard & Drummond, 1978, original designation.

**Diagnosis.** Rostrum constricted. Eyes present. Article 2 of antenna 1 elongate, ventral setae widely spread. Article 1 of antenna 2 weakly ensiform, article 3 with 3+ facial setules, facial spines on article 4 in 4+2 rows, spines thick, article 5 very short. Right mandibular incisor with 3 teeth, right lacinia mobilis bifid, weakly flabellate, molar not triturative, large, elongate, conical, then subtruncate, bearing 3-4 large special spines; palpal hump small, apex of palp article 3 oblique. Inner plate of maxilla 1 with 3-5 setae, palp 2-articulate. Maxillipeds ordinary, apex of palp article 3 not strongly protuberant, dactyl elongate, apical nail not distinct.

Gnathopods small, similar, article 5 of gnathopods 1-2 free, elongate, palms transverse, propodus poorly setose anteriorly, trichophoxin in shape. Article 5 of pereopods 3-4 without posteroproximal setae, article 6 with thick armaments. Article 2 of pereopod 5 of broad form, articles 4-5 of pereopods 5-6 broad; pereopod 7 miniaturised, article 3 enlarged, dactyl ordinary.

Epimeron 1-2 with long facial brushes or posterior setae, epimeron 3 of ordinary classification, bearing many long setae. Urosomite 3 without dorsal hook. Peduncle of uropod 1 without inter-ramal spike, without major displaced spine, rami of uropods 1-2 continuously spinose to apex, with subapical spines or nails, inner ramus of uropod 1 with 2 rows of marginal spines. Inner ramus of uropod 2 ordinary. Uropod 3 ordinary, one of rami longer than peduncle, bearing article 2 on outer ramus, with 3 apical setae. Telson ordinary.

**Relationship.** Differing from *Urophoxus (= Pontharpinia)* in the unusual mandibular molar, trichophoxin gnathopods, miniaturisation of pereopod 7, presence of inter-ramal spike on uropod 1, and many other characters (see Barnard & Drummond, 1978). See *Booranus*, *Trichophoxus* and *Waitangi*. 

Barnard & Karaman: Marine Gammaridean Amphipoda 631

**Habitat and distribution.** Marine, south-eastern Australia, 2-150 m, 4 valid and 3 dubious species.

*Torridoharpinia* Barnard & Karaman


**Type species.** *Proharpinia hurleyi* J.L. Barnard, 1958, original designation.

**Diagnosis.** Rostrum unconstricted. Eyes present. Article 2 of antenna 1 short, ventral setae ventrally spread or almost confined apically. Article 1 of antenna 2 not ensiform, article 3 with 4 facial setules, facial spines on article 4 in 1 main row, all spines thin, article 5 short. Right mandibular incisor with 3 teeth, right lacinia mobilis bifid, flabellate, molar not triturative, with 2 splayed spines; palp hump small, apex of palp article 3 oblique. Inner plate of maxilla 1 with 2-4 (type) setae, palp 2-articulate. Maxillipeds ordinary, apex of palp article 3 not strongly protuberant, dactyl elongate, apical nail distinct.

Gnathopods small, dissimilar, gnathopod 2 weakly to moderately enlarged, article 5 of gnathopods 1-2 short, free on gnathopod 1, cryptic on gnathopod 2, palms oblique, propodus ovate-rectangular but broadened on gnathopod 2, poorly setose anteriorly. Article 5 of pereopods 3-4 with posteroaxial setae, article 6 with thin armaments. Article 2 of pereopod 5 of narrow form, articles 4-5 of pereopods 5-6 medium to narrow; pereopod 7 ordinary, article 3 enlarged, dactyl ordinary.

Epimera 1-2 without long facial brushes or posterior setae, epimeron 3 of ordinary classification, bearing 3 or more long setae. Urosomite 3 without dorsal hook. Peduncle of uropod 1 without inter-ramal spike, without major displaced spine, rami of uropods 1-2 not continuously spinose to apex, inner ramus of uropod 1 only in male with 2 rows of marginal spines. Inner ramus of uropod 2 ordinary. Uropod 3 ordinary, one of rami longer than peduncle, bearing article 2 on outer ramus, with 1 or 2 (type) apical setae. Telson ordinary, but one apical element stout (contrast *Proharpinia*).

**Relationship.** Differing from *Proharpinia* in the lack of ramal spines on female uropod 2, the shortened outer ramus of uropod 1, the presence of 1-2 long apical setae on article 2 of the outer ramus on uropod 3, the presence of a stout spine on each lobe of the telson and the presence of setae on the inner plate of maxilla 1. *Proharpinia* has only thin setae or setules on the telson.


**Habitat and distribution.** Marine, New Zealand, Auckland Islands, Campbell Island, Galapagos Islands, 0-46 m, 2 species.

*Trichophoxus* K.H. Barnard


**Type species.** *Trichophoxus capillatus* K.H. Barnard, 1930, monotypy.

**Diagnosis.** Rostrum constricted, small. Eyes present. Article 2 of antenna 1 elongate, ventral setae widely spread. Article 1 of antenna 2 weakly ensiform, article 3 with many facial setules, facial spines on article 4 in 2+ rows, plus special apical spines, spines thick, article 5 short. Right mandibular incisor with 4 teeth, right lacinia mobilis bifid, thin, molar not triturative, large, elongate, conical, then subtruncate, bearing 4 large special spines; palp hump small, apex of palp article 3 oblique. Inner plate of maxilla 1 with 4 setae, palp 2-articulate. Maxillipeds ordinary, apex of palp article 3 not strongly protuberant, dactyl elongate, apical nail not distinct.

Gnathopods small, similar, article 5 free, elongate, without eusirid attachment, palms transverse, propodus elongate, heavily setose anteriorly, trichophoxin in shape. Article 5 of pereopods 3-4 without posteroaxial setae, article 6 with thick armaments. Article 2 of pereopod 5 of broad form, articles 4-5 of pereopods 5-6 broad; pereopod 7 miniaturised, article 3 enlarged, dactyl ordinary.

Epimera 1-3 with long facial brushes or posterior setae, epimeron 3 of ordinary classification, bearing 3 or more long setae. Urosomite 3 without dorsal hook. Peduncle of uropod 1 without inter-ramal spike, with major displaced spine apicolaterally, some rami of uropods 1-2 continuously spinose to apex, inner ramus of uropod 1 with 1 row of marginal spines. Inner ramus of uropod 2 ordinary. Uropod 3 ordinary, one of rami longer than peduncle, bearing article 2 on outer ramus, with 2-3 apical setae. Telson with supernumerary lateral spines, setules shifted distad.

**Relationship.** Differing from *Tipimegus* in (1) lateral spination on telson; (2) presence of 4 (versus 3) setae on inner plate of maxilla 1; (3) presence of only 1 row of spines on inner ramus of uropod 1; (4) strong distad shift in dorsal setule pairs on telson and 11 other characters (see Barnard & Drummond, 1978).

Species. *Trichophoxus capillatus* K.H. Barnard, 1930
**Habitat and distribution.** Marine, New Zealand, 0-3 m, 2 species.

**Uldanamia** Barnard & Drummond

**Type species.** *Uldanamia pillare* Barnard & Drummond, 1978, original designation.

**Diagnosis.** Rostrum unconstricted, elongate, with large apicoventral process. Eyes present. Article 2 of antenna 1 short, ventral setae almost confined apically. Article 1 of antenna 2 not ensiform, article 3 with 2 facial setules, facial spines on article 4 in 2+ rows, some spines thick, some spines thin, article 5 ordinary. Right mandibular incisor with 3 teeth, right lacinia mobilis flabellate, molar not triturative, with 3 basally fused spines; palp hump large, apex of palp article 3 oblique. Inner plate of maxilla 1 without setae, palp 1-articulate. Maxilliped plates small, poorly armed, apex of palp article 3 not strongly protuberant, dactyl elongate, apical nail distinct.

Gnathopods similar, gnathopod 2 weakly enlarged, article 5 of gnathopods 1-2 free, elongate, palms chelate, propodus of gnathopods 1-2 thin, elongate, poorly setose anteriorly. Articles 4-5 of pereopods 3-4 immensely setose posteroproximally, article 6 with thin and thick armaments. Article 2 of pereopod 5 of broad form but tapering distally, articles 4-5 of pereopods 5-6 medium to narrow; pereopod 7 ordinary, article 3 ordinary, dactyl vestigial.

Epimera 1-2 without long facial brushes or posterior setae, epimeron 3 of rounded classification but with 3 deep posterior notches, bearing 3 or fewer long setae. Urosomite 3 without dorsal hook. Peduncle of uropod 1 without inter-ramal spike, without major displaced spine, some rami of uropods 1-2 almost continuously spinose to apex, inner ramus of uropod 1 with 1 row of marginal spines. Inner ramus of uropod 2 ordinary. Uropod 3 ordinary, one of rami longer than peduncle, bearing article 2 on outer ramus, with 2 apical setae. Telson elongate, with supernumerary dorsal spines.

**Relationship.** Differing from *Limnoporeia* in the elongate and free carpus of gnathopod 2, the serrate epimeron 3, densely setose pereopods 3-4 and heavily spinose telson.

**Species.** *Uldanamia pillare* Barnard & Drummond, 1978 [782].

**Habitat and distribution.** Marine, Victoria, 8-15 m, 1 species.

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**Urophoxus** Gurjanova (= *Pontharpinia* Stebbing)  
Figs 107B, 109D, 110G, 111D

**Pontharpinia** Stebbing, 1897: 32. (Urothoe pinguis Haswell, 1879b, monotypy) [name unavailable by ICZN rule on confused type species].--Barnard & Drummond, 1978: 40.

**Urophoxus** Gurjanova, 1977: 85.

**Type species.** *Urothoe pinguis* Haswell, 1879b, original designation.

**Nomenclature.** Although Barnard & Drummond (1976) tried to save *Pontharpinia* for *Urothoe pinguis* Haswell, they were too late in getting their plea to ICZN and Gurjanova, ignoring our quest, captured the nomenclature. Stebbing did not have Haswell’s species in hand when he established *Pontharpinia*. He had a species later known as *Paraphoxus stebbingi* J.L. Barnard (1958) now transferred to *Tipimegus*.

**Diagnosis.** Rostrum unconstricted. Eyes present. Article 2 of antenna 1 short, ventral setae widely spread. Article 1 of antenna 2 not ensiform, article 3 with 4+ facial setules, facial spines on article 4 in 2+ rows, all spines thick, article 5 ordinary. Right mandibular incisor with 3 teeth, right lacinia mobilis flabellate, molar triturative, palp hump small, apex of palp article 3 oblique. Inner plate of maxilla 1 with 5+ setae, palp 2-articulate. Maxillipeds ordinary, apex of palp article 3 not strongly protuberant, dactyl elongate, apical nail distinct.

Gnathopods dissimilar, gnathopod 2 moderately enlarged, article 5 of gnathopod 1 of ordinary length, free, of gnathopod 2 short, with eusirid attachment, cryptic, palms oblique, propodus of gnathopods 1-2 ordinary, elongate, broadened, poorly setose anteriorly. Article 5 of pereopods 3-4 without postero proximal setae, article 6 with thin armaments. Article 2 of pereopod 5 of broad form, articles 4-5 of pereopods 5-6 broad, pereopod 7 ordinary, article 3 ordinary, dactyl ordinary.

Epimera 1-2 with long facial brushes of setae, epimeron 3 of ordinary classification. Urosomite 3 without dorsal hook. Peduncle of uropod 1 without inter-ramal spike, with major displaced spine, rami of uropods 1-2 continuously spinose to apex, with subapical spines or nails, inner ramus of uropod 1 with 1 row of marginal spines. Inner ramus of uropod 2 ordinary. Uropod 3 ordinary, one of rami longer than peduncle, bearing article 2 on outer ramus, with 3 apical setae. Telson elongate, with supernumerary dorsolateral setal brush.

**Relationship.** The basic phoxocephalid. Distinguished by the setal brushes on the telson. See *Mandibulophoxus* and *Tipimegus*.

**Species.** *Urophoxus pinguis* (Haswell, 1879b) (not Stebbing, 1897) (Barnard & Drummond, 1978) [784].
Habitat and distribution. Marine, New South Wales, Victoria, 2-40 m, 1 species.

Vasco Barnard & Drummond


Type species. *Metaphoxus brevidactylus* Ledoyer, 1973a, original designation.

Diagnosis. Rostrum unconstricted. Eyes weak. Article 2 of antenna 1 short, ventral setae confined apically. Article 1 of antenna 2 not ensiform, article 3 with [22 facial setules], facial spines on article 4 in 2+ rows, spines thick, article 5 ordinary. Right mandibular incisor with 3 teeth, right lacinia mobilis simple, flabellate, molar not triturative, with [no spines]; palp hump medium, apex of palp article 3 rounded-truncate. Inner plate of maxilla 1 [without setae], palp 1-articulate. Maxillipeds [with small plates, poorly armed, apex of palp [article 3 not strongly protruberant, dactyl ?elongate, apical nail ?distinct].

Gnathopods enlarged, weakly dissimilar, gnathopod 2 strongly enlarged, article 5 of gnathopods 1-2 very short, cryptic, palms oblique, propodus of gnathopods 1-2 elongate to broadened respectively, poorly setose anteriorly. Article 5 of pereopods 3-4 with scarcely any posterosproximal setae, article 6 with thin and thick armaments. Article 2 of pereopod 5 of broad form, articles 4-5 of pereopods 5-6 medium to narrow; pereopod 7 ordinary, article 3 ordinary; dactyl 

Additional character. Dactyls of pereopods 3-4 stunted.

Relationship. The stunted dactyls of pereopods 3-4 distinguish this genus from others in the *Metaphoxus* group. *Vasco* differs from *Metaphoxoides* in the longer carpus of gnathopod 1 and long article 2 on the outer ramus of uropod 3.

Species. *Vasco brevidactylus* (Ledoyer, 1973a, 1986) [694].

Habitat and distribution. Marine, Madagascar, 11-49 m, 1 species.

Waipirophoxus Gurjanova


Type species. *Paraphoxus waipiro* J.L. Barnard, 1972b, original designation.

Diagnosis. Like *Wildus* but inner rami of uropods 1-2 lacking marginal spines, lateral apex of peduncle on uropod 1 with 2 spines (versus 1).

Relationship. Probably not distinct from *Wildus* but several attributes remain undescribed.

Species. *Waipirophoxus waipiro* (J.L. Barnard, 1972b) [775].

Habitat and distribution. Marine, New Zealand, shallow water, 1 species.

Waitangi Fincham

Fig. 60F


Type species. *Paraphoxus rakiura* Cooper & Fincham, 1974, original designation.

Diagnosis. Rostrum constricted, strong to obsolescent. Eyes present. Article 2 of antenna 1 elongate, ventral setae widely spread. Article 1 of antenna 2 weakly ensiform, article 3 with many facial setae, facial spines on article 4 in 2+ rows, spines thick, article 5 very short. Right mandibular incisor with 3 teeth, right lacinia mobilis bifid, weakly flabellate, molar not triturative, large, elongate, conical, then subtruncate, bearing 3-4 large special spines; palp hump small, apex of palp article 3 oblique. Inner plate of maxilla 1 with 3 [type unknown] setae, palp 2-articulate. Maxillipeds ordinary, apex of palp article 3 not strongly protruberant, dactyl elongate, apical nail not distinct.

Gnathopods small, similar, article 5 free, elongate, without eusirid attachment, palms transverse to chelate, propodus thin, elongate, heavily setose anteriorly, trichophoxin in shape. Article 5 of pereopods 3-4 without posterosproximal setae, article 6 with thin armaments. Article 2 of pereopod 5 of broad form, articles 4-5 of pereopods 5-6 broad; pereopod 7 miniaturised, article 3 enlarged, dactyl ordinary.

Epimera 1-2 [with long facial brushes or posterior setae, epimeron 3 of ?rounded classification, bearing ?3 or fewer long setae]. Urosomite 3 [without dorsal hook]. Peduncle of uropod 1 without inter-ramal spike, without major displaced spine, rami of uropods 1-2 not continuously spinose to apex, inner rami of uropod 1 without marginal spines. Inner rami of uropod 2 ordinary. Uropod 3 ordinary, one of rami longer than other; dactyl elongate, apical nail not distinct.

Additional character. Dactyls of pereopods 3-4 stunted.

Relationship. The stunted dactyls of pereopods 3-4 distinguish this genus from others in the *Metaphoxus* group. *Vasco* differs from *Metaphoxoides* in the longer carpus of gnathopod 1 and long article 2 on the outer ramus of uropod 3.

Species. *Vasco brevidactylus* (Ledoyer, 1973a, 1986) [694].

Habitat and distribution. Marine, Madagascar, 11-49 m, 1 species.
inner ramus of uropod 1 with 2 row of marginal spines. Inner ramus of uropod 2 ordinary. Uropod 3 ordinary, one of rami longer than peduncle, bearing article 2 on outer ramus, with 3 apical setae. Telson with supernumerary lateral or dorsal spines.

**Variables.** *Waitangi brevirostris* with severely reduced rostrum, untoothed incisors, thicker armaments on article 6 of pereopods 3-4 than type specimens, and absence of setae on peduncles and rami of uropods 1-2, and thus probably not a member of *Waitangi*.

**Relationship.** Differing from *Trichophoxus* and *Tipimegus* in the presence of long setae on the peduncles and rami of uropods 1-2.

**Species.** *Waitangi brevirostris* Fincham, 1977 [779]; ?*W. chelatus* (Cooper, 1974) [774]; *W. rakiura* (Cooper & Fincham, 1974) [776].

**Habitat and distribution.** Marine, New Zealand, intertidal sand beaches, 2 valid and 1 probable species.

*Wildus* Barnard & Drummond

Fig.109G

*Wildus* Barnard & Drummond, 1978: 133.

**Type species.** *Wildus thambaroo* Barnard & Drummond, 1978, original designation.

**Diagnosis.** Rostrum unconstricted. Eyes present. Article 2 of antenna 1 short, ventral setae confined apically. Article 1 of antenna 2 not ensiform, article 3 with 2 facial setules, facial spines on article 4 in 2+ rows, some spines thick, some spines thin, article 5 very short. Right mandibular incisor with 3 teeth, right lacinia mobilis bifid, thin, molar not triturative, with 3 basally fused spines; palpal hump medium, apex of palp article 3 truncate. Inner plate of maxilla 1 with 2 setae, palp 2-articulate. Maxillipedal inner plates partly fused, both pairs small, poorly armed, apex of palp article 3 not protuberant, dactyl elongate, apical nail distinct.

Gnathopods dissimilar, gnathopod 2 weakly enlarged, article 5 of gnathopod 1 of ordinary length, free, of gnathopod 2 short and cryptic, palms oblique, propodus of gnathopods 1-2 ovatoangular, poorly setose anteriorly. Article 5 of pereopods 3-4 with posteroproximal setae, article 6 with thin and thick armaments. Article 2 of pereopod 5 of broad form, articles 4-5 of pereopods 5-6 medium to narrow; pereopod 7 ordinary, article 3 ordinary, dactyl ordinary.

Epimera 1-2 without long facial brushes or posterior setae, epimeron 3 of rounded classification, bearing 3 or fewer long setae. Urosomite 3 without dorsal hook. Peduncle of uropod 1 without inter-ramal spike, with major displaced spine apicomediadly, rami of uropods 1-2 not continuously spinose to apex, without subapical spines or nails, inner ramus of uropod 1 with 1 row of marginal spines. Inner ramus of uropod 2 ordinary. Uropod 3 ordinary, one of rami longer than peduncle, bearing article 2 on outer ramus, with 2 long apical setae. Telson ordinary to elongate.

**Relationship.** Differing from *Brolgus* and *Gamba* in bearing 2 apical setae on the outer ramus of uropod 3; from *Kuritus* in the stouter and more diverse gnathopods with cryptic article 5 on gnathopod 2. See Elpeddo.

**Removal.** *Wildus fuegiensis* Schellenberg, 1931, to *Fuegiphoxus*.

**Species.** *Wildus mullokus* Barnard & Drummond, 1978 [784]; *W. paraithambaroo* Myers, 1985c [576]; *W. thambaroo* Barnard & Drummond, 1978 [787]; *W. waipiro* (J.L. Barnard, 1972b) [775] (see *Waipirophoxus*).

**Habitat and distribution.** Marine, southern Australia and New Zealand, ?Magellan, 0-6 m, 3 valid and 1 dubious species.

*Yammacoona* Barnard & Drummond

Figs107E, 111H

*Yammacoona* Barnard & Drummond, 1978: 166.

**Type species.** *Yammacoona kunarella* Barnard & Drummond, 1978, original designation.

**Diagnosis.** Rostrum obsolescent. Eyes present. Article 2 of antenna 1 elongate, ventral setae confined proximally. Article 1 of antenna 2 scarcely ensiform, article 3 with 2 facial setules, facial spines on article 4 in 2+ rows, plus special apicoventral spines, spines tflck, article 5 ordinary. Right mandibular incisor with 5+ teeth, right lacinia mobilis bifid, flabellate, molar not triturative, with 4+ basally fused spines; palpal hump large, apex of palp article 3 truncate. Inner plate of maxilla 1 with 4 setae, palp 2-articulate. Maxillipedal plates very small, poorly armed, apex of palp article 3 strongly protuberant, dactyl elongate, apical nail distinct.

Gnathopods weakly dissimilar, gnathopod 2 weakly enlarged, article 5 of gnathopod 1 of ordinary length, free, of gnathopod 2 short and cryptic, palms oblique, propodus of gnathopods 1-2 broadened, poorly setose anteriorly. Article 5 of pereopods 3-4 with posteroproximal setae, article 6 with thick armaments. Article 2 of pereopod 5 of broad form, articles 4-5 of pereopods 5-6 broad; pereopod 7 ordinary, article 3 ordinary, dactyl vestigial.

Gnathopods weakly dissimilar, gnathopod 2 weakly enlarged, article 5 of gnathopod 1 of ordinary length, free, of gnathopod 2 short and cryptic, palms oblique, propodus of gnathopods 1-2 broadened, poorly setose anteriorly. Article 5 of pereopods 3-4 with posteroproximal spines, article 6 with thick armaments. Article 2 of pereopod 5 of broad form, articles 4-5 of pereopods 5-6 broad; pereopod 7 ordinary, article 3 ordinary, dactyl vestigial.

Gnathopods 1-2 with long facial brushes but no posterior setae, epimeron 3 of ordinary classification, bearing 3 or more long setae. Urosomite 3 without dorsal hook.
Peduncle of uropod 1 without inter-ramal spike, without major displaced spine, rami of uropods 1-2 not continuously spinose to apex, but some with subapical spines or nails, inner rami of uropod 1 with 1 row of marginal spines. Inner rami of uropod 2 ordinary. Uropod 3 ordinary, one of rami longer than peduncle, bearing article 2 on outer ramus, with 2-3 apical setae. Telson ordinary.

Relationship. Differing from *Matong* and *Kota* in shortened article 3 of antenna 1, proximal placement of ventral setae on article 2 of antenna 1, reduction in rows of facial spines on article 4 of antenna 2 with consolidation into a longer row, enlarged palpal hump on mandible, smaller plates of maxillipeds, and free inner rami of uropod 2.

See *Synphoxus*.

Species. *Yammacoona kunarella* Barnard & Drummond, 1978 [782].

Habitat and distribution. Marine, Victoria, 12-17 m, 1 species.

*Yan* Barnard & Drummond


Type species. *Yan tiendi* Barnard & Drummond, 1978, original designation.

Diagnosis. Rostrum constricted. Eyes present. Article 2 of antenna 1 short, elongate to medium in length, ventral setae narrowly spread. Article 1 of antenna 2 not ensiform, article 3 with 2 facial setules, facial spines on article 4 in 2+ rows, all spines thick, article 5 ordinary. Right mandibular incisor with 4+ teeth, right lacinia mobilis bifid, flabellate, molar not triturative, with 4+ spayed spines; palp hump small, apex of palp article 3 oblique. Inner plate of maxilla 1 with 3 setae, palp 2-articulate. Maxillipedal plates small but setation ordinary, apex of palp article 3 not strongly protuberant, dactyl elongate, apical nail distinct.

Gnathopods ordinary, small, similar, gnathopod 2 scarcely enlarged, article 5 of gnathopods 1-2 of ordinary length to elongate, free, palms oblique, propodus of gnathopods 1-2 ordinary, often thin, ovato-rectangular, poorly setose anteriorly. Article 5 of pereopods 3-4 with posteroproximal setae, article 6 with thick armaments. Article 2 of pereopod 5 of broad form, articles 4-5 of pereopods 5-6 broad to medium; pereopod 7 ordinary, article 3 ordinary, dactyl vestigial or absent.

Epimera 1-2 without long facial brushes or posterior setae, epimeron 3 of rounded classification, bearing 3 or fewer long setae. Urosomite 3 without dorsal hook. Peduncle of uropod 1 without inter-ramal spike, without major displaced spine, rami of uropods 1-2 continuously spinose to apex, with subapical spines or nails, inner ramus of uropod 1 with 1 row of marginal spines. Inner ramus of uropod 2 ordinary. Uropod 3 ordinary, one of rami longer than peduncle, bearing article 2 on outer ramus, with 2 apical setae. Telson ordinary.

Relationship. Like *Birubius* but dactyl of pereopod 7 vestigial or absent.


Habitat and distribution. Marine, southern Australia, intertidal, shallow water, 2 species.

**Phoxocephalids of Unknown Generic Assignment**

*Pontharpinia centralis* Schellenberg, 1938a [381]; *Phoxocephalus erythrophthalmus* (Catta, 1875) [348]; *Phoxocephalus geniculatus* (Stimpson, 1856) [395]; *Phoxocephalus obtusus* (Stimpson, 1856) [395]; *Paraphoxus pyripes* K.H. Barnard, 1930 (= *Pontharpinia maxima* Stephensen, 1947) [870]; *Pontharpinia obliqua* K.H. Barnard, 1932 [833 + 871]; *Parharpinia rotundifrons* K.H. Barnard, 1932 [833]; *Pontharpinia barnardi* Pirlot, 1932 [633].

**PHOXOCEPHALOPSISIDAE** Barnard & Clark, 1984a

Diagnosis. Haustoriid with rostrum of moderate size, broad; cheek weak. Antenna 1 of haustorius form, article 1 short, main setal row strong, article 2 as long as article 1, article 3 shorter, primary flagellum elongate, accessory flagellum short. Antenna 2 of haustorius form, article 4 expanded, with facial spines near base, article 5 shorter and narrower than article 4, these articles furnished with 1 or more longitudinal rows of facial armaments, ventral margin with long setae, and 2 other kinds but none glassy; flagellum longer than article 4 of peduncle. Epistome and upper lip distinct. Mandibles with stubby, sparsely but distinctly toothed incisors, laciniae mobiles diverse, rakers sparse and widely separate, molar of medium size, triturative, choppers weak; palp 3-articulate, article 3 not bevelled, with apical fan of setae, with urohaustoriid setal distribution, setae hooked but not awned. Lower lip with mandibular lobes moderately well developed. Maxilla 1 with 2-articulate palp, inner plate small and with 1 seta. Maxilla 2 ordinary, inner plate with oblique facial row of setae. Maxillipeds with unexpanded bases and no baler lobes, with normally enlarged plates, outer spine; palp 4-articulate, article 2 expanded, article 4 clavate, multisetose.

Coxae 1-4 evenly integrated by stepped enlargement from coxa 1 onwards, coxa 4 dominant, coxa 1 medium and slightly tapering, coxa 3-4 not (type) or distinctly
(other species) produced posteroventrally. Coxal gills 2-6; brood-plates slender. Gnathopods feeble, grossly alike in proportions, carpus elongate, but gnathopod 1 almost simple, gnathopod 2 minutely subchelate, article 3 short. Article 5 of pereopods 3-4 broad, slightly expanded, not deeply lobate, with thin posterior spines;

Fig. 112. Phoxocephalopsidae. All Phoxocephalopsis species except (L) Puelche orensanzii.
dactyls of pereopods 3-7 well developed; pereopod 5 of haustorioid form, articles 2, 4 and 5 expanded, articles 4-5 with extensive facial rows of spines; pereopods 6-7 alike, articles 5-6 weakly expanded; no pereopod with underslung articulation.

Pleopods like urohaustoriids but pleopod 3 inferior (not 2). Epimera 2 weakly dominant in setation and size. Urosomites ordinary. Ramus of uropod 1 styliform, naked; of uropod 2 rod-like and spinose or with several setae; uropod 3 of ordinary haustorioid-phoxocephalid kind, neither ramus dominant, both leaflike, article 2 on outer ramus very small and poorly setose. Telson short, broad, deeply cleft. [Sexual dimorphism unknown.]

See key in Haustorioida.

**Relationship.** Phoxocephalopsids lie in position ancestral both to Zobrachiodae-Urohaustoriidae and Haustoriidae, and at present appear to be the most primitive living haustorioids known. Despite this assertion the family has several apomorphic characters, such as the simple gnathopod 1 and dominant epimeron 2. One might consider Zobracho as more primitive because of its subchelate gnathopods; Phoxocephalopsis, in contrast to Zobracho, retains more or less plesiomorphic uropods 1-2 and first maxillary palp. Except for epimeron 2 and the poorly setose maxillae and weak raker system, it could form a plausible ancestor to the Haustoriidae, which have numerous modifications in mouthparts and pereopods. Phoxocephalopsids cannot be derived from any zobrachoid or urohaustoriid without evolutionary reversal to normalcy in uropods 1-2.

Phoxocephalopsids differ from urothoids in the antennae.

**Key to Genera of Phoxocephalopsidae**

1. Epimeron 2 dominant, epimera with posteroverentral points, coxa 2 with more than half surface area of coxa 3, rakers present, incisors toothed ........................................ Phoxocephalopsis

--- Epimeron 3 dominant, epimera untoothed, coxa 2 with less than one third surface area of coxa 3, rakers absent, incisors untoothed ........................................ Puelche

**Phoxocephalopsis** Schellenberg

Fig.112


Haustoriella Barnard, 1931a: 426 (Haustoriella psammophila, K.H. Barnard, 1931a, monotypy).

**Type species.** Phoxocephalopsis zimmeri Schellenberg, 1931, monotypy.

**Diagnosis.** Incisors toothed; rakers present. Coxa 2 much larger than 1, only slightly smaller than 3, with more than half surface area of 3. Epimeron 2 dominant.

**Variables.** Dactyl of pereopod 5 naked (typical), spinose (species of Ruffo, 1956b); outer ramus of uropod 2 with apical spines (typical), lacking apical spines (P. deceptionis).

**Species.** Phoxocephalopsis deceptionis Stephensen, 1947a [872]; P. gallardoi Barnard & Clark, 1984 (= P. zimmeri identification of Barnard & Drummond, 1982c [866]; P. mehuensis Varela, 1983 [765]; P. psammophila (K.H. Barnard, 1931a, 1932) [833]; P. zimmeri Schellenberg, 1931 (not Barnard & Drummond, 1982c) (Barnard & Clark, 1984) [860]; species (= identification of P. zimmeri of Ruffo, 1956b) [751].

**Habitat and distribution.** Marine, South Brazil to Magellan and Falkland Islands, then to central Chile, 4-112 m, 5 species.

**Puelche** Barnard & Clark

Fig.112L

**Puelche** Barnard & Clark, 1982b: 262.

**Type species.** Puelche orensanzi Barnard & Clark, 1982, original designation.

**Diagnosis.** Incisors untoothed; rakers absent. Coxa 2 reduced, about one third surface area of coxa 3, scarcely larger than coxa 1. Epimeron 3 dominant.

**Species.** Puelche orensanzi Barnard & Clark, 1982b [862].

**Habitat and distribution.** Marine, Argentina, San Roman Beach, sandy, 1 species.
PHREATOGAMMARIDAE Bousfield, 1982
[see Barnard & Barnard (1983)]

PLATYISCHNOPIDAE Barnard & Drummond, 1979

Diagnosis. Rostrum strong, cylindrical, with subapical ventral retrorse process, cheek poorly developed. Antenna 1 of haustorius form or urothoe form (typical), flagellum elongate. Antenna 2 of urothoe form, article 5 slightly to strongly shorter and slightly narrower than article 4, latter without major-facial armament, ventral margin with 1 kind of armament, either setae or glassy spines, flagellum often greatly elongate in male and antenna 2 bearing calceoli. Prebuccal complex massive, upper lip dominant, epistome scarcely evident. Mandibles bearing short, broad, phoxocephalid-like incisors with 3 main teeth or stubby modifications thereof, 1 of these widely disjunct; flagellum elongate. Antenna 2 of urothoe form, article 5 lacking outer setae, triturative, bearing spinules, lacking accessory lobes well developed. Maxilla 1 with 1-articulate palp, article 3-articulate, article 3 lacking outer setae, all spines concentrated on apical bevel. Lower lip with discrete inner lobes, mandibular extensions of outer lobes well developed. Maxilla 1 with 1-articulate palp, inner plate with fewer than 5 setae. Maxilla 2 ordinary or outer plate enlarged, inner plate with poorly developed oblique facial row of setae. Maxillipeds with unexpanded bases, poorly enlarged plates, outer spinose; palp 4-articulate, article 2 wide but not differentially expanded, article 4 unguiform, with or without nail. No bale exos on any maxillae or maxillipeds.

Coxae variable but coxa 4 strongly dominant and posterodorsally excavate, thus with posteriorly directed lobe, coxa 3 rectangular, or ventrally narrow, coxae 1-2 of various dimensions. Coxal gills on segments 2-6, 3-7, or 2-7; brood plates slender. Gnathopods feeble or slightly enlarged, alike or not, carpus more or less elongate, propodus elongate or not, strongly or weakly chelate. Article 5 of pereopods 3-4 narrow, with sparse posterior spineation; dactyls of pereopods 3-7 well developed or pereopod 5 weakly of haustorius form, articles 2, 4, occasionally 5, expanded, articles 4-5 with weakly developed facial spineation; pereopods 6-7 more or less alike but pereopod 7 larger, article 2 usually of modified phoxocephalid form, article 4 of pereopods 6-7 expanded; no pereopod with underslung articulation.

Pleopod 2 not inferior. Peduncles of pleopods much longer than wide, coupling hooks of haustorius kind; inner ramus as long as outer (or very nearly), bearing multiple clothespin spines with small inner barbs. Epimeron 1 well developed; epimeron 2 often dominant in size. Urosomites ordinary. Rami of uropods 1-2 styiform or rodlike, spinose; uropod 3 of phoxocephalid form but inner ramus very small to moderate in size, article 2 of outer ramus small to greatly elongate, apices of rami poorly setose. Telson variable, cleft to entire. Sexual dimorphism occurring on antenna 2 and uropod 3.

See key in Haustorioidea.

Model genus. Tiburonella is used as the basic genus of this family owing to the apomorphic conditions of Platyischnopus.

Phylogeny. We consider the generalised derivative sequence in this family to be: Tiburonella, Eudevenopus, Tittakunara, Tomituka, Yurrokus, and large gap to Indischnopus, Platyischnopus, with Skaptopus seemingly forming a branch near Indischnopus (similar coxae, rakers, pleonite 3) but retaining basic antenna 1.

Relationship. Platyischnopids have so many characters in common with the subfamily Phoxocephalinae (Phoxocephalidae) that one might derive them from an ancestor common to that group. The structure of the mandibular incisors and the pattern of spine distribution on the mandibular palp, plus the shape of coxa 4 suggest this affinity. Article 2 of pereopod 7 has faint similarity to that of phoxocephalids but the remainder of the appendage is much stouter and more elongate than in phoxocephalids. The unusual head is a distinguishing mark.

Platyischnopids also have many superficial similarities to several species of Synopiidae, especially to the genus *Pseudotiron* which has a similar head. Synopids differ from platyischnopids in the more elongate articles on the peduncle of antenna 1, the magniramous uropod 3 lacking article 2 on the outer ramus, the unreduced inner ramus similar to the outer ramus, the well-setose inner plate of maxilla 1, the presence of facial setae on the inner plate of maxilla 2, the callynophore of the primary flagellum on antenna 1, the longer outer plate of the maxilliped and the non-chelate gnathopods.

See ‘Condukiidae’ for further comments.

Key to Genera of Platyischnopidae

1. Head lacking apical process between antennae ...................................... Skaptopus

   — Head with apical rostral process between antennae ....................................... 2
2. Article 2 of antenna 1 about 1.4 times as long as article 1, coxa 3 distally tapering .................................................. *Platyschnopus*

   — Article 2 of antenna 1 not exceeding 1.1 times as long as article 1, coxa 3 distally broad ........................................... 3

3. Pleonite 3 with dorsal teeth, mandibular rakers absent, setae on palp article 2 of mandible vestigial or absent .................. *Indischnopus*

   — Pleonite 3 naked, mandibular rakers present, setae on palp article 2 of mandible present ........................................... 4

4. Coxa 1 of ordinary length and rectangular ............................................ 5

   — Coxa 1 short and shoe-shaped ............................................ 6

5. Telson lacking lateral brush of setae, posterior lobe of coxa 4 tapering ............................................................... *Tiburonella*

   — Telson with lateral brush of setae, posterior lobe of coxa 4 not tapering ......................................................... *Eudevenopus*

6. Article 2 of pereopod 7 with soft notch, telson with dorsofacial spines .................................................................. *Tittakunara*

   — Article 2 of pereopod 7 with sharp cusp, telson lacking dorsofacial spines ......................................................... 7

7. Article 5 of gnathopods 1-2 longer than article 6, gnathopods chelate ............................................................... *Tomituka*

   — Article 5 of gnathopods 1-2 scarcely longer than 6, gnathopods poorly chelate ................................................... *Yurrokus*

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**Eudevenopus** Thomas & Barnard 1983b: 3.


**Type species.** *Platyischnopus metagracilis* J.L. Barnard, 1964b, original designation.

**Diagnosis.** Head bearing apical rostral process between antennae. Article 2 of antenna 1 not exceeding 1.1 times as long as article 1. Mandibular rakers present; setae on palp article 2 present. Coxa 1 of ordinary length and rectangular; coxa 3 distally broad; posterior lobe of coxa 4 not tapering. Article 5 of gnathopods 1-2 not longer than article 6, gnathopods strongly chelate. Article 5 of pereopod 7 with soft notch. Pleonite 3 dorsally naked. Telson with lateral brush of setae.

**Variables.** Dactyl of pereopod 7 long or short; inner ramus of uropod 2 strongly or scarcely shortened.

**Relationship.** Differing from *Tiburonella* in the lateral brushes of setae on the telson, presence of only 1 seta on inner plate of maxilla 1 and see Thomas & Barnard (1983b) for many minor points.

**Species.** *Eudevenopus gracilipes* (Schellenberg, 1931, 1935a) (Thomas & Barnard, 1983b) [765]; *E. honduranus* Thomas & Barnard, 1983b (= *E. capuciatus* Oliveira, 1955c) [490]; *E. metagracilis* (J.L. Barnard, 1964b, *nomen nudum*) (Thomas & Barnard, 1983b) [369].

**Habitat and distribution.** Marine, Eastern Pacific from Baja California to middle Chile, Western Atlantic from South Carolina to southern Brazil, 1-73 m, 3 species.

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**Indischnopus** Barnard & Drummond 1979: 33.

*Indischnopus* Barnard & Drummond, Fig.113A

**Type species.** *Platyischnopus herdmani* Walker, 1904, original designation.
**Diagnosis.** Head bearing apical rostral process between antennae. Article 2 of antenna 1 about 1.4 times as long as article 1. Mandibular rakers absent; setae on palp article 2 or absent. Coxa 1 of ordinary length and shoe-shaped; coxa 3 distally broad; posterior lobe of coxa 4 tapering and sharp. Article 5 of gnathopods 1-2 much longer than article 6, gnathopods poorly chelate. Article 5 of pereopod 7 with sharp cusps. Pleonite 3 with dorsal teeth. Telson lacking lateral brush of setae.

**Relationship.** Like *Platyischnopus* in elongate articles 2-3 of antenna 1, lack of rakers, and lack of setae on article 2 of the mandibular palp, but differing in the larger and congested coxae 1-3, sharp point on coxa 4, dorsal teeth of pleonite 3 and deeper telsonic cleft. See *Skaptopus*.


**Habitat and distribution.** Marine, South Africa to southern India, ?10-?126 m, 2 species.

*Platyischnopus* Stebbing

Figs 113C,D, 114A,D


**Type species.** *Platyischnopus mirabilis* Stebbing, 1888, monotypy.

**Diagnosis.** Head bearing apical rostral process between antennae. Article 2 of antenna 1 exceeding 1.4 times as long as article 1. Mandibular rakers absent; setae on palp article 2 absent. Coxae 1-3 very short, diverse; coxa 3 distally tapering; posterior lobe of coxa 4 not tapering. Article 5 of gnathopods 1-2 much longer than article 6, gnathopods chelate. Article 5 of

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pereopod 7 with sharp cusp. Pleonite 3 dorsally naked. Telson lacking lateral brush of setae.

Additional characters. Teeth of incisor absent; spines of outer plate on maxilla 1 strongly curved or siaceous, often festooned; telson almost entire, lacking mid-dorsal spines.

Relationship. Differing from Tiburonella, Eudevenopus, Titakunara, Tomituka and Yurrokus in the elongate articles 2-3 of antenna 1, lack of rakers, lack of setae on article 2 of mandibular palp and smallness of coxa 1-3 together.

See Indischnopus.

Removal. Platyischnopus neozelanicus Chilton, 1897, to Otagia in Condukiidae.

Species. Platyischnopus mam (Barnard & Drummond, 1979) (= P. mirabilis by Chilton, 1922b, not Stebbing, 1888) [781]; P. mirabilis Stebbing, 1888, 1906, 1910a (Barnard & Drummond, 1979) [784].

Habitat and distribution. Marine, south-eastern Australia, 4-40 m, 2 species.

Skaptopus Thomas & Barnard


Type species. Skaptopus brychius Thomas & Barnard, 1983b, original designation.

Diagnosis. Head lacking apical rostral process between antennae. Article 2 of antenna 1 about not exceeding 1.1 times as long as article 1. Mandibular rakers absent; setae on palp article 2 vestigial or absent. Coxa 1 of ordinary length and rectangular; coxa 3 distally broad; posterior lobe of coxa 4 evenly rounded. Article 5 of gnathopods 1-2 scarcely longer than article 6, gnathopods poorly chelate. Article 5 of pereopod 7 with soft notch. Pleonite 3 with dorsal teeth. Telson lacking lateral brush of setae.

Sexual dimorphism. Article 3 of male antenna 1 with huge setal brush, article 4 of antenna 2 swollen.

Relationship. Differing from all other platyischnopids in the reduced rostral area lacking sensory pits. Combining basic antenna 1 with absence of rakers as in Platyischnopus and Indischnopus but with large congested coxae 1-3 and toothed epimeron 3 like Indischnopus.

Species. Skaptopus brychius Thomas & Barnard, 1983b [361].

Habitat and distribution. Marine, north-western Atlantic from Georges Bank to Virginia, 129-175 m.

Fig. 114. Platyischnopidae. A, Platyischnopus mirabilis; B, Tomituka doowi; C, Tiburonella viscana; D, Platyischnopus mam.
**Tiburonella** Thomas & Barnard

Fig.114C


**Type species.** *Platyischnopus viscana* J.L. Barnard, 1964b, original designation.

**Diagnosis.** Head bearing apical rostral process between antennae. Article 2 of antenna 1 about 1.1 times as long as article 1. Mandibular rakers present; setae on palp article 2 present. Coxa 1 of ordinary length and rectangular; coxa 3 broad; posterior lobe of coxa 4 tapering. Article 5 of gnathopods 1-2 not longer than article 6, gnathopods strongly chelate. Article 5 of pereopod 7 with soft notch. Pleonite 3 dorsally naked. Telson lacking lateral brush of setae.

**Relationship.** Considered to be the basic or model platyischnopid because of the presence of head process, short articles 2-3 of peduncle on antenna 1, presence of rakers and setae on article 2 of mandibular palp, unreduced coxae, regular shape of article 2 on pereopod 7 with soft hump or notch, and smooth dorsum of pleonite 3.

**Species.** *Tiburonella viscana* (J.L. Barnard, 1964b) (Thomas & Barnard, 1983b) [490].

**Habitat and distribution.** Marine, eastern Pacific from southern California to Costa Rica; Western Atlantic at Belize; 3-27 m, 1 species.

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**Tomituka** Barnard & Drummond

**Fig.**

*Tomituka* Barnard & Drummond, 1979: 16.

**Type species.** *Tomituka doowi* Barnard & Drummond, 1979, original designation.

**Diagnosis.** Head bearing apical rostral process between antennae. Article 2 of antenna 1 about 1.1 times as long as article 1. Mandibular rakers present; setae on palp article 2 present. Coxa 1 short, shoe-shaped; coxa 3 distally broad; posterior lobe of coxa 4 not tapering. Article 5 of gnathopods 1-2 much longer than article 6, gnathopods chelate. Article 5 of pereopod 7 with sharp cusp. Pleonite 3 dorsally naked. Telson lacking lateral brush of setae.

**Relationship.** Differing from *Tiburonella* and *Eudevenopus* in the shoe-shaped coxa 1, sharp point of article 2 on pereopod 7, and long carpus of gnathopods.

**Species.** *Tomituka doowi* Barnard & Drummond, 1979 [782].

**Habitat and distribution.** Marine, Australia, Victoria, 4-8 m, 1 species.

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**Tittakunara** Barnard & Drummond


**Type species.** *Tittakunara katoa* Barnard & Drummond, 1979, original designation.

**Diagnosis.** Head bearing apical rostral process between antennae. Article 2 of antenna 1 not exceeding 1.1 times as long as article 1. Mandibular rakers present; setae on palp article 2 present. Coxa 1 short and hemilunar; coxa 3 distally broad; posterior lobe of coxa 4 not tapering. Article 5 of gnathopods 1-2 longer than article 6, gnathopods poorly chelate. Article 5 of pereopod 7 with soft notch. Pleonite 3 dorsally naked. Telson lacking lateral brush of setae.

**Relationship.** Differing from *Tiburonella* and *Eudevenopus* in the small coxa 1 and elongate carpus of gnathopods. From *Tomituka* and *Yurrokus* in the soft notch (versus sharp point) on article 2 of pereopod 7.

**Species.** *Tittakunara katoa* Barnard & Drummond, 1979 [781].

**Habitat and distribution.** Marine, Australia, New South Wales, 0 m, 1 species.

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**Yurrokus** Barnard & Drummond

**Fig.**

*Yurrokus* Barnard & Drummond, 1979: 23.

**Type species.** *Yurrokus cooroo* Barnard & Drummond, 1979, original designation.

**Diagnosis.** Head bearing apical rostral process between antennae. Article 2 of antenna 1 not exceeding 1.1 times as long as article 1. Mandibular rakers present; setae on palp article 2 present. Coxa 1 short; shoe-shaped; coxa 2 shoe-shaped; coxa 3 distally broad; posterior lobe of coxa 4 not tapering. Article 5 of gnathopods 1-2 scarcely longer than article 6, gnathopods poorly chelate. Article 5 of pereopod 7 with sharp cusp. Pleonite 3 dorsally naked. Telson lacking lateral brush of setae.

**Relationship.** Differing from *Tiburonella* ** **
**Eudevenopus** in the short coxa 1, shoe-shaped coxa 2, point on article 2 of pereopod 7, and lack of tooth on epimeron 3. From *Tomitaka* in the thick propodus of gnathopod 1 and lack of tooth on epimeron 3.

**Species.** *Yurrokoos cooroo* Barnard & Drummond, 1979 [782].

**Habitat and distribution.** Marine, Australia, Victoria, 4 m, 1 species.

**PLEUSTIDAE** Buchholz, 1874

**Diagnosis.** Accessory flagellum 1-articulate or absent. Lower lip of special form, inner lobes wide (fused or not), outer lobes especially tilted inward, mandibular lobes short, giving appearance in Figure 115A.

See Eusiridae and Iphimediidae.

**Description.** Body smooth or dorsally and/or laterally keeled. Rostrum small or huge. Mouthparts ordinary though article 3 of maxillipedal palp often produced and dactyl rarely reduced. Anterior coxae never as acuminate as in Iphimediidae. Gnathopods generally small to feeble. Pereopods of ordinary dimensions, occasionally dactyl toothed. Outer rami of uropods 1-2 usually shortened. Uropod 3 ordinary, outer ramus occasionally shortened slightly, peduncle rarely with ventral extension. Telson medium, entire or weakly cleft.

**Relationship.** Differing from Iphimediidae and Eusiridae in the special form of the lower lip. From Iphimediidae also in the poorly to non-acuminate anterior coxae.

**Removals.** *Parepimeriella* Schellenberg (1931) is removed to *Parepimeria* in the Iphimediidae (= Paramphithoidae) though Schellenberg (1931) described the lower lip as of pleustid form. However, the long, thin, simple and heavily setose gnathopods relate it to *Parepimeria* which for the moment fits Iphimediidae better than Pleustidae. *Neopleustes euacanthoides* Gurjanova, 1972, to *Parapleustes euacanthoides*; *Neopleustes rasmyslovi* Gurjanova, 1951, to *Arctopleustes*; *Parapleustes barnardi* Ledoyer, 1972c, to *Tepidopleustes*; *Parapleustes echinoicus* Tzvetkova, 1975b, to *Dactylopleustes*; *Parapleustes glabricauda* Dunbar, 1954, to *Arctopleustes*; *Parapleustes honomu* J.L. Barnard, 1970a, to *Tepidopleustes*; *Neopleustes nautilus* J.L. Barnard, 1969a, to *P. behningi*; *Parepimeriella* Schellenberg, 1931, to *Parepimeria*; *Pleustes medius* Goes, 1866, to *Pleustomesus*; *Pleustoides* Gurjanova, 1972, to *Pleusymtes*; *Stenopleustes gagarae* Gurjanka, 1972, to *Parapleustes*; *Sympleustes corniger* Shoemaker, 1952, to *Parapleustes*.

**Key to Genera of Pleustidae**

1. Molar very large, triturative, columnar

   —Molar feeble, nontriturative or poorly triturative, conical

   8

2. Gnathopods 1-2 simple, (articles 5-6 bearing numerous long setae along posterior margin) (Iphimediidae) *Parepimeria*

   —Gnathopods 1-2 subchelate, articles 5-6 moderately to poorly setose (exception, *Mesopleustes*)

   3

3. Article 2 of antenna 1 with long dorsal distal tooth (not ventral)

   —Article 2 of antenna 1 without dorsodistal tooth, ventral tooth occasional

   4

4. Rostrum reaching more than 60% along article 1 on peduncle of antenna 1

   —Rostrum reaching 40% or less along article 1 on peduncle of antenna 1

   6
5. Coxa 1 not covered by coxa 2; coxa 4 strongly tapering distally .............................................................. \textit{Mesopleustes}

\hspace{1em}--- Coxa 1 strongly covered by coxa 2; coxa 4 not tapering distally .............................................................. \textit{Pleustomesus}

6. Article 3 of maxilliped palp strongly produced distally .............................................................. \textit{Stenopleustes}

\hspace{1em}--- Article 3 of maxilliped palp not produced distally .............................................................. \textit{7}

7. Carpal lobes of gnathopods narrow, sharp or absent, accessory flagellum short or absent ......................................... (= \textit{Pleustoides}) \textit{Pleusymtes}

\hspace{1em}--- Carpal lobes of gnathopods broadly truncate, accessory flagellum elongate ................................................ \textit{Cleonardopsis}

8. Peduncle of uropod 3 with large ventrodistal plate supporting rami .......................................................... \textit{Austropleustes}

\hspace{1em}--- Peduncle of uropod 3 without large ventrodistal plate supporting rami ........................................................ \textit{9}

9. Rostrum exceeding apex of article 1 on peduncle of antenna 1 .............................................................. \textit{Pleustes}

\hspace{1em}--- Rostrum reaching 50\% or less along article 1 of peduncle on antenna 1 ........................................................ \textit{10}

10. Gnathopods 1-2 of eusirid-shape .......................................................... \textit{Pleusirus}

\hspace{1em}--- Gnathopods 1-2 not of eusirid-shape .......................................................... \textit{11}

11. Article 3 of maxilliped palp produced or article 4 absent ........................................................ \textit{12}

\hspace{1em}--- Article 3 of maxilliped palp not produced, article 4 well developed, nail-shaped ................................ \textit{14}

12. Posterior margin of epimeron 3 smooth, distoposterior corner tooth usually present; article 5 of gnathopods 1-2 shorter than article 6 ........................................................ \textit{13}

\hspace{1em}--- Posterior margin of epimeron 3 bearing numerous serrations, distoposterior corner tooth poorly marked; article 5 of gnathopods 1-2 longer than article 6 ........................................................ \textit{Tepidopleustes}

13. Gnathopods dissimilar to each other; gnathopod 1 slender, with article 5 longer than article 6, without lobe; gnathopod 2 large, article 5 shorter than article 6, without lobe ........................................................ \textit{Arctopleustes}

\hspace{1em}--- Gnathopods 1-2 similar to each other in shape, both with article 5 shorter than article 6, bearing lobe ........................................................ \textit{Neopleustes}

14. Dactyl of pereopods 3-7 slender, without teeth along inferior margin; distal margin of both lobes on maxilla 2 with setae ........................................................ \textit{Parapleustes}

\hspace{1em}--- Dactyl of pereopods 3-7 stout, with teeth along inferior margin; distal margin of both lobes on maxilla 2 with spines ........................................................ \textit{Dactylopleustes}
Arctopleustes Gurjanova


Type species. Neopleustes rasmyslovi Gurjanova, 1951, original designation.


Relationship. Like Neopleustes except for the unequal gnathopods.

Species. Arctopleustes glabricauda (Dunbar, 1954) (Karaman & Barnard, 1979) (Just, 1980) [220]; A. rasmyslovi (Gurjanova, 1951) (Gurjanova, 1972) [292].

Habitat and distribution. Marine, Ungava to Thule to Kara Sea, 65-124 m, 2 species.

Austropleustes K.H. Barnard

Fig.116G


Habitat and distribution. Marine, South Georgia and South Shetlands, 230-342 m, 2 species.

Cleonardopsis K.H. Barnard


Relationship. Close to the Iphimediidae except for the shape of coxae 1-4, the especially large coxa 4 with distoposterior lobe, and all coxae with subrounded distal margin. Differing from Pleusymtes in the truncate carpal lobes of the gnathopods and the elongate accessory flagellum.

Species. Cleonardopsis carinata K.H. Barnard, 1916 (= Amathillopleustes alticoxa Pirlot, 1934) (Schellenberg, 1926c) (Stephensen, 1944c) (Griffiths, 1975) [420B].

Habitat and distribution. Marine, probably deep cosmopolitan, 564-1189 m, 1 species.
Dactylopleustes Karaman & Barnard

Dactylopleustes Karaman & Barnard, 1979: 112.

Type species. Parapleustes echinoicus Tzvetkova, 1975b, original designation.


Fig. 115. Pleustidae. A, Pleustes panopla; B, Pleusyntes glaber; C, Mesopleustes abyssorum; D, Stenopleustes lanipes; E, Neopleustes pulchellus.
Relationship. Differing from *Parapleustes* in the toothed dactyls of the pereopods and stout armament on maxilla 2.

Species. *Dactylopleustes echinoicus* (Tzvetkova, 1975b) (Vader, 1978) [2811].

Habitat and distribution. Marine, Commander Islands, near Bering Strait, on *Strongylocentrotus polyacanthus*, littoral, 1 species.

*Mesopleustes* Stebbing

Figs 115C, 116E


Type species. *Pleustes abyssorum* Stebbing, 1888, original designation.

Diagnosis. Also entered in Key to Iphimediidae. Body keeled. Rostrum long. Peduncular article 2 of antenna 1 almost as long as article 1. Accessory flagellum obsolescent. Labrum not incised. Mandibular molar large, triturative. Inner plates of labium obsolescent. Maxillae 1-2 ordinary. Plates of maxilliped short, palp 4-articulate, powerful, article 3 without distal tubercle, dactyl well developed. Coxae 1-4 subacuminate distally, coxa 1 somewhat shortened, not covered by coxa 2. Gnathopods 1-2 moderately stout, subchelate, unequal, gnathopod 1 slender, article 5 stout, shorter.
than article 6, lobe short, broad, propodus weakly expanded. Gnathopod 2 stout, article 5 much shorter than article 6, lobe moderately large, propodus expanded. Dactyls of pereopods 3-7 not ornamented. Epipods unornamented. Rami of uropods 1-3 lanceolate, outer shortened, peduncle of uropod 3 without tooth. Telson entire.

**Relationship.** See couplet 5 of key. The coxae are somewhat reminiscent of those in Iphimediae but the placement of this genus in that key shows that it is rather foreign to that family.

**Species.** *Mesopleustes abyssorum* Stebbing, 1888 (Pirlot, 1936b) (Chevreux, 1927) (J.L. Barnard, 1964d, 1967a) [420BA + 1].

**Habitat and distribution.** Marine, probably cosmopolitan deep, 694-3479 m, occasionally attached to palps of *Colossendeis colossa*, 1 species.

*Neopleustes* Stebbing

Figs 115E, 116H.


**Type species.** *Amphioxe pulchella* Kroyer, 1846d, original designation.

**Diagnosis.** Body smooth or keeled. Rostrum moderately long. Peduncular article 2 of antenna 1 shorter than article 1. Accessory flagellum obsolescent. Labrum incised asymmetrically. Mandibular molar feeble, conical, non-triturative. Inner plates of labium partly coalesced. Maxillulae 1-2 ordinary. Plates of maxillipeds short, palp 4-articulate, powerful, article 3 with distal tubercle, dactyl well developed. Coxae 1-4 ordinary, or slightly acuminate distally, especially coxa 1. Gnathopods 1-2 slender, subchelate, equal, article 5 shorter than article 6, lobes weak or absent, propodus weakly expanded. Dactyls of pereopods 3-7 not ornamented. Epipods unornamented. Rami of uropods 1-3 lanceolate, outer shortened, peduncle of uropod 3 without tooth. Telson entire.

**Variables.** Head with dorsal keel (*N. boecki*); with large anterovelar tooth (type), tooth weak (*N. boecki*); coxae 1-4 weakly acuminate (type), not (*N. boecki*, etc.).

**Relationship.** Differing from *Parapleustes* in the produced article 3 of the palp on the maxillipeds.

**Species.** See Dunbar (1954); *N. boecki* (Hansen, 1888) (Sars, 1895) (Gorbunov, 1946) (Gurjanova, 1951) [220]; *N. carinatus* Margulis, 1963 [283]; *N. pulchellus* (Kroyer, 1846a) (Sars, 1895 as *Parapleustes* (= *N. euacantha* Sars, 1885, 1886), (N. p. typicus [Kroyer] identifications of Gurjanova, 1951; Bulycheva, 1957c; Margulis, 1963; Shoemaker, 1930a, 1955a) [200].

**Habitat and distribution.** Marine, Arctic south to Gulf of St. Lawrence, and Okhotsk Sea, 7-800 m, 3 species.

*Parapleustes* Buchholz


**Incisocalliope* J.L. Barnard, 1959a: 22 (Incisocalliope newportensis J.L. Barnard, 1959a, original designation).

**Type species.** *Parapleustes gracilis* Buchholz, 1874, monotypy.

**Diagnosis.** Body smooth or keeled. Rostrum short. Peduncular article 2 of antenna 1 shorter than article 1. Accessory flagellum obsolescent. Labrum incised asymmetrically. Mandibular molar feeble, conical, non-triturative. Inner plates of labium partly coalesced. Maxillulae 1-2 ordinary. Plates of maxillipeds short, palp 4-articulate, powerful, article 3 without distal tubercle, dactyl well developed. Coxae 2-4 ordinary, or coxae 1-3, acuminate distally, coxa 1 variable in size, rarely slightly covered by coxa 2. Gnathopods 1-2 moderately stout to slender, subchelate, equal, or gnathopod 2 stout, article 5 shorter than article 6, lobes present (except in *P. oculusand* and *P. longimanus*), much shorter than article 6, propodus moderately expanded. Dactyls of pereopods 3-7 not ornamented. Epipods unornamented. Rami of uropods 1-3 lanceolate, outer shortened, peduncle of uropod 3 without long tooth. Telson entire.

**Variables.** Body with 10 teeth (*P. euacanthoides*), with 5 teeth (*P. gagarae*); pleon with 1 or 2 teeth (*P. monocuspis* and *P. hicuspis* etc.), or smooth (*P. assimilis*); anteroventral corner of head with or without tooth; coxae 1-3 acuminate and posterovertrally serrate (*P. euacanthoides*); carpal lobes on gnathopods well developed (*P. monocuspis*), weak (*P. assimilis*), absent (*P. oculatus*, *P. longimanus*); propodi enlarged but palms obsolescent (*P. den*); thin (*P. oculatus*, *P. longimanus*); propodus of gnathopod 2 enlarged, sculptured (*P. cornigerus*); pereopods 3-7 prehensile (*P. commensalis*).

**Relationship.** Differing from *Neopleustes* and *Arctopleustes* in the unproduced article 3 of the maxillipedal palp.

See *Tepidopleustes*.

**Removals.** *Parapleustes barnardi* Ledoyer, 1972c, and *P. honomu* J.L. Barnard, 1970a, to *Tepidopleustes*. 

Barnard & Karaman: Marine Gammaridean Amphipoda 649
Species. See Ishimaru (1984); P. aestuarius Watling & Mauer, 1973 (Fox & Bynum, 1975) [364]; P. assimilis (Sars, 1883, 1895) (Schellenberg, 1942) (Gurjanova, 1951) (Dunbar, 1954) [216]; P. behningi (Gurjanova, 1938b) (= P. nautilus J.L. Barnard, 1969a) (Gurjanova, 1951) (Kudrjaschov, 1972b) (Kudrjaschov & Zajagintsev, 1975) (Ishimaru, 1984) [230 + 270]; P. bicuspis (Krøyer, 1838b) (= P. bidentatus McIntosh, 1874) (Sars, 1895) (Chevreux & Fage, 1925) (Schellenberg, 1942) (Gurjanova, 1951) (Lincott, 1979a) [216]; P. bicuspoides Nagata, 1965b [395]; P. commensalis Shoenmaker, 1952 (J.L. Barnard, 1969b) (Bicksten, 1982) [370]; P. corinigerus (Shoenmaker, 1964) (Karaman & Barnard, 1979) [229b]; P. den J.L. Barnard, 1969a [273]; P. dershavini (Gurjanova, 1938b, 1951) (Ishimaru, 1984) [394] (= P. makiki J.L. Barnard, 1970a, 1971a) [381]; P. dilatatus Ishimaru, 1984 [394]; P. eucanthoides (Gurjanova, 1972) (Karaman & Barnard, 1979) [281]; differ by short, acuminate, serrate coxa 1, its mouthparts were never described; it is incertae sedis]; P. gasarue (Gurjanova, 1972) (Karaman & Barnard, 1979) [232b]; P. gracilis Buchholz, 1874 (lapsus P. gracilis) (= P. brevicornis) Sars, 1883, 1895) (Sexton, 1909) (Gurjanova, 1951) (Ishimaru, 1984) [200]; P. longimanus Ishimaru, 1984 (close to P. oculatus) [394]; P. major (Bulycheva, 1952) [391]; P. mielcki (Sokolowsky, 1925) (Stephensen, 1929) [237]; P. monocuspis (Sars, 1895) (Stephensen, 1938b, 1940b, 1944a) (Gurjanova, 1951) [216]; P. oculatus (Holmes, 1908) (= P. jouhanni Gurjanova, 1951) (= P. pacifica Walker, 1898b) (Barnard & Given, 1960) [230]; P. pugettenissis (Dana, 1853) (= P. baideri Bocck, 1871a) (= P. newportensis J.L. Barnard, 1959d) (J.L. Barnard, 1952c, 1966a, b, 1969a) (Barnard & Given, 1964) (Shoenmaker, 1964) [270 + 370]; P. siniupalmus Dunbar, 1954 [258 + N]; P. trianguloculatus (Bulycheva, 1952) [391]; P. tricuspis Ishimaru, 1984 [394]; “species” Oldevig, 1959 [209b]; “species” Hamond, 1965, 1967 [239]; “species” Feeley & Wass, 1970 [363].

Habitat and distribution. Marine, mostly Artic-boreal, 0-881 m (but usually shallow), south to Georgia, southern California, western France, Japan, and Hawaiian-islandine, 21 species.

Pleusirus J.L. Barnard

Fig.116F


Type species. Pleusirus secorrus J.L. Barnard, 1969a, original designation.


Relationship. Characterised by the eusirid gnathopods.

Species. Pleusirus secorrus J.L. Barnard, 1969a (= P. s. asiaticus Kudrjaschov & Tzetkovka, 1975) (Ishimaru, 1985a) [373, 280].

Habitat and distribution. Marine, North Pacific Basin from Hokkaido around to southern California, 0-46 m, 1 species.

Pleustes Bate

Figs 115A, 116B


Type species. Pleustes tuberculata Bate, 1858b (= Amphithoe panopla Krøyer, 1838b), monotypy.

Diagnosis. Body keeled. Rostrum long. Peduncular article 2 of antenna 1 shorter than article 1. Accessory flagellum obsolescent. Labrum incised symmetrically. Mandibular molar feeble, conical, non triturative. Inner plates of labium partly coalesced. Maxillae 1-2 ordinary. Plates of maxilliped short, palp 4-articulate, powerful, article 3 without distal tubercle, dactyl well developed. Coxae 1-4 ordinary, or slightly accumulate distally, coxa 1 variable in size. Gnathopods 1-2 stout, subchelate, equal, article 5 stout, much shorter than article 6, lobes well developed but much shorter than article 6, propodus expanded. Dactyls of pereopods 3-7 not ornamented. Epimera unornamented. Rami of uropods 1-3 lanceolate, outer shortened, peduncle of uropod 3 without long tooth. Telson entire.

Variables. Coxae 4-6 with facial teeth or only marginal teeth, coxa 4 blunt or sharp below, occasionally coxae 1-3 sharp or double-acuminate below.

Relationship. Very difficult to recognise except by the large rostrum exceeding the apex of article 1 on the peduncle of antenna 1.

Species. Pleustes angulatus (Shoemaker, 1955a), P. a. angulatus Gurjanova, 1972 [231b]; P. a. paradoxus Gurjanova, 1972 [286]; P. cataphractus (Stimpson, 1853) (Stephensen, 1938b) (Gurjanova, 1972); P. c. japonensis Gurjanova, 1972; P. c. obtusirostris Gurjanova, 1938b,

Habitat and distribution. Marine, circum-Arctic-boreal south to Japan, California, Fundy and New England, 0-1026 m, 9 species.

Pleustomesus Gurjanova


Type species. Paramphithoe media Goes, 1866, original designation.

Diagnosis. Body smooth, keeled. Rostrum long. Peduncular article 2 of antenna 1 much shorter than article 1. Accessory flagellum obsolete. Labrum incised symmetrically. Mandibular molar large, triturative. Inner plates of labium partly coalesced. Maxillae 1-2 ordinary. Plates of maxilliped short, palp 4-articulate, powerful, article 3 without distal tubercle, dactyl well developed. Coxa 1 short, almost fully covered by coxa 2. Gnathopods 1-2 moderately slender, subchelate, slightly unequal, article 5 shorter than article 6, lobes present or absent, propodus not expanded. Dactyls of pereopods 3-7 not ornamented, Epimera unornamented. Rami of uropods 1-2 [?lanceolate, outer not shortened, of uropod 3 lanceolate, equal, outer shortened, peduncle of uropod 3 with long tooth]. Telson [?entire or incised weakly.]

Additional characters. Articles 1-2 of antenna 1 with long anterodorsal tooth.

Relationship. Characterised by the tooth on article 1 (and/or 2) of antenna 1.

Species. Pleustomenus displosus Gurjanova, 1972 [232A].

Habitat and distribution. Marine, Pacific Ocean, 57°45'08"N, 151°14'E, 2300 m, 1 species.

Pleustostenus J.L. Barnard


Type species. Pleustostenus displosus Gurjanova, 1972, original designation.

Diagnosis. Body covered with short spines. Rostrum short, obsolete. Peduncular article 2 of antenna 1 as long as article 1. Accessory flagellum obsolete. Labrum incised symmetrically. Mandibular molar large, triturative. Inner plates of labium partly coalesced. Maxillae 1-2 ordinary. Plates of maxilliped short, palp 4-articulate, powerful, article 3 with distal tubercle, dactyl well developed. Coxa 1 short, covered by coxa 2. Coxae 3-4 not acuminate distally. Gnathopods 1-2 moderately stout to slender, subchelate, unequal, gnathopod 1 slender, article 5 slender, stout, article 5 shorter than article 6, lobes, small propodus not expanded. Dactyls of pereopods 3-7 not ornamented, Epimera unornamented. Rami of uropods 1-2 [?lanceolate, outer not shortened, of uropod 3 lanceolate, equal, outer shortened, peduncle of uropod 3 with long tooth]. Telson [?entire or incised weakly.]

Additional characters. Articles 1-2 of antenna 1 with long anterodorsal tooth.

Relationship. Characterised by the tooth on article 1 (and/or 2) of antenna 1.

Species. Pleustostenus displosus Gurjanova, 1972 [232A].

Habitat and distribution. Marine, Pacific Ocean, 57°45'08"N, 151°14'E, 2300 m, 1 species.

Amphithopsis glaber Boeck, 1861, original designation.

Diagnosis. Body smooth or keeled. Rostrum short. Peduncular article 2 of antenna 1 shorter than article 1. Accessory flagellum obsolete, Labrum incised almost symmetrically. Mandibular molar large, triturative. Inner plates of labium coalesced. Maxillae 1-2 ordinary. Plates of maxilliped short, palp 4-articulate, powerful, article 3...
without distal tubercle, dactyl well developed. Coxae 1-4 ordinary, or coxa 1 slightly shortened; coxae occasionally or slightly acuminate distally. Gnathopods 1-2 moderately stout, or slender, subchelate, often unequal; gnathopod 1 slender, article 5 slightly longer or shorter than article 6, lobe weak or absent, propodus weakly expanded. Gnathopod 2 often stout, article 5 shorter or longer than article 6, lobe moderately large, propodus often expanded. Dactyls of pereopods 3-7 not ornamented. Epimera unornamented or with weak posteroventral tooth. Rami of uropods 1-3 lanceolate, outer shortened, peduncle of uropod 3 without long tooth. Telson entire.

**Variables.** Article 1 of antenna 1 with ventral tooth (P. glaber, P. coquilla, etc.), article 2 almost as long as article 1 (P. ochirjamkini); coxae 1-2 sharp anteroventrally (P. quadridens, P. ochoticus); carpus of gnathopod 2 short (type), almost as long as propodus (P. pulchellus); pleopods slightly aberrant (P. brachypalma); rami of uropod 1 extending equally (P. coquilla); body keeled (P. carinata); head with anteroventral tooth (P. glabroides, etc.).

**Relationship.** Differing from *Stenopleustes* in the lack of a lobe on article 3 of the maxilliped palp. From *Pleusymtes* in the small rostrum. From *Neopleustes* and *Parapleustes* in the triturative molar. From *Cleonardopsis* in the non-truncate carpal lobes of the gnathopods and the short to absent accessory posteroventral tooth. Rami of uropods 1-3 lanceolate, outer shortened, peduncle of uropod 3 without long tooth. Telson entire.

**Species.** See Shoemaker (1930a); P. brachypalma Ishimaru, 1985a [394]; P. buttoni (Dunbar, 1954) [258]; P. carinata Gurjanova, 1972 [283]; P. coquilla J.L. Barnard, 1971b (Karaman & Barnard, 1979) [268]; P. glaber (Boeck, 1861) (= P. exigua Goes, 1866) (Sars, 1895) (Chevreux & Fage, 1925) (Schellenberg, 1942) (Gurjanova, 1951) (Bousfield, 1973) (Lincoln, 1979a) [200]; P. glabroides (Dunbar, 1954) (Just, 1980) [260]; P. japonica (Gurjanova, 1938b, 1951) [280]; P. karnii Ishimaru, 1985a [391]; P. karstensi (Stappers, 1911) (Gurjanova, 1951) (Shoemaker, 1955a) [220]; P. karstensi (J.L. Barnard, 1959e) [201]; P. mucida Ishimaru, 1985a [394]; P. ochirjamkini Bulycheva, 1952 [391]; P. palmata (Margulis, 1963) [282]; P. pulchella (Sars, 1876, 1885, 1895, as *Parapleustes*) (Stephensen, 1938b, 1944a) (Gurjanova, 1951) [220]; P. quadrangularis (Margulis, 1963) [283], P. q. brevipes Ishimaru, 1985a [394]; P. quadridens (Bulycheva, 1955) (Gurjanova, 1972); P. q. ochoticus Gurjanova, 1972 [280 + B]; P. similis (Margulis, 1963) [283]; P. suberitobia (Gurjanova, 1938b, 1951) [280 to 287]; P. subglaber (Barnard & Given, 1960) (J.L. Barnard, 1966a) [373]; P. uncigera (Gurjanova, 1938b, 1951) (Shoemaker, 1955a) (Kudrjaschov & Zejagitsev, 1975) [280 + 267]; P. ushakovi (Bulycheva, 1952) [391].

**Habitat and distribution.** Marine, circum-Arctic-boreal south to Japan, California, Chesapeake and Biscay, 0-200 m, 18 species.
boreal south to Baja California, Hatteras, Biscay-Azores, (not yet reported north-western Pacific), 0-1410 m, 8 species.

_Tepidopleustes_ Karaman & Barnard


_Type species._ *Parapleustes barnardi* Ledoyer, 1972, original designation.

**Diagnosis.** Body keeled. Rostrum moderately long. Peduncular article 2 of antenna 1 as long as article 1 (but both short). Accessory flagellum obsolescent. Labrum incised asymmetrically. Mandibular molar feeble, conical, non triturative. Inner plates of labium partly coalesced. Maxillae 1-2 ordinary. Plates of maxilliped short, palp weakly 4-articulate or strongly 3-articulate, powerful, article 3 with distal tubercle, dactyl partly reduced or obsolescent. Coxae 1-4 short. Gnathopods eusirid gnathopods, reduced dactyl and produced article 3 of the maxilliped palp. Dactyls of pereopods 3-7 not ornamented.


**Habitat and distribution.** Marine, Madagascar, Mauritius and Hawaii, 5-45 m, 2 species.

**PLIOPLATEIDAE** J.L. Barnard, 1978a

_Diagnosis._ Head slightly reduced in size. Urosomites 2-3 very small and 'indistinct'; pleon slightly flexed; thorax slightly depressed, calcified, broad, strongly carinate and rugose. Anterior coxae slightly splayed but not much larger than posterior coxae. Eyes small, ommatidial. Antenna 2 short but antenna 1 elongate, antenna 2 basally fused. Mandibular molar vestigial; maxillae feeble. Gnathopods subchelate. Peduncles of pleopods not expanded. Uropod 3 without ramus. Telson much broader than long, not ovate, posterior margin straight, entire (type) or cleft.

See Phliantidae, Ceinidae, and key to Talitroidea.

**Description.** Rostrum short, erect, with tooth on either side. Accessory flagellum absent. Flagellum of antenna 1 elongate, multiarticulate, that of antenna 2 shorter. Mandibular rakers apparently absent, palp absent. Inner lobes of lower lip absent. Inner plate of maxilla 1 vestigial, spines on outer plate 6-7. Maxilla 2 poorly armed. Plates of maxilliped of medium size, almost subequal, palp thin, elongate, dactyl extremely long and unguiform. Gnathopods apparently with slightly elongate article 3, propodus elongate but expanded apically and subchelate. Article 2 of pereopods 5-7 unexpanded. Dorsal carination pattern with large double tooth on pereonite 1, each following segment with large tooth, rugosity absent on pleonite 3 and urosomites. No peduncle of pleopods expanded; rami of pleopods 1-2 well developed but 1-articulate, those of pleopod 3 vestigial. Uropods 1-2 ordinary; uropod 3 extremely small, without rami. Brood plates broad, setose, curl-tips [unknown].

**Variables.** Pleopod 3 circular, rami absent; telson cleft (*P. nodiformis*).

**Relationship.** Similar to Phliantidae in general body form and rugosity pattern but differing in: longer antennae (especially antenna 1), thorn-like rostrum, equalised plates of maxilliped and greatly elongate, thin palp with immense dactyl; distinctly subchelate gnathopods; evenly extending ventral line of coxae; thin article 2 on pereopods 5-7; unexpanded peduncles of pleopods; and very broad, rectangular telson. Genus living in much deeper water than Phliantidae.

_Plioplateidae_ probably are derived from Ceinidae but differ from such genera as *Tahape* and *Waitomo* in the depressed head with complex cuspidation, the cuspidation on body, coxae and antennae, the odd maxilla 2, the lack of large setae on the gnathopods and the presence of inner lobes on the lower lip. Differing from the equally advanced Kuriidae in the cuspidation of head, body and coxae, the small c"oxa 4, small article 2 of pereopods 5-7, expanded propodus of the gnathopods, disparity in sizes of antennae 1-2 and extremely large mandibular molar; Kuriidae have a ramus on uropod 3.

_Plioplateia_ K.H. Barnard

Fig.117


_Type species._ *Plioplateia triquetra* K.H. Barnard, 1916, monotypy.

_Diagnosis._ Maxilla 1 with palp. Palp of maxilliped 4-
articulate. Gnathopods subchelate. Pereopods simple. No pleopodal peduncle expanded, both rami of pleopod 3 vestigial or absent. Uropod 3 without ramus.

**Description.** Antennae large. Molar prominent. Plates of maxilla 2 separate. Plates of maxilliped subequal in size, palp thin, dactyl unguiform and greatly elongate. Coxae apparently poorly splayed, anterior coxae unusually short, coxa 5 as long as coxa 4. Article 2 of pereopods 5-7 not expanded. Inner rami of pleopods 1-2 slightly shortened (or not in second species). Outer rami of uropod 1 shortened (or not). Head, pereon and pleonites 1-2 with large dorsal teeth, pereonites with sharp lateral teeth above coxae.

**Remarks.** Diagnosis made in fashion of Phliantidae for comparison.

**Species.** *Plioplateia* nodiformis Ledoyer, 1986 [725wM]; *P. triquetra* K.H. Barnard, 1916 (J.L. Barnard, 1978a) [743].

**Habitat and distribution.** Marine, South Africa and offshore Walters Bank, 50-105 m, 2 species.

**PODOCERIDAE** Leach, 1814b


**Diagnosis.** Corophioid with urosomite 1 elongate, twice or more as long as urosomite 2. Uropod 3 minute or absent. Abdomen flexed beneath thorax. Pereopods glandular or not. Accessory flagellum variable, often absent. Body variable, broadly depressed or subcylindrical, occasionally rugose or weakly toothed and carinate; some posterior pereonites or posterior urosomites occasionally fused together; coxae small, usually discontinuous, but occasionally splayed. Antennae very long. Mouthparts basic except upper lip occasionally bilobed and inner plate of maxilla 1 usually

![Fig. 117. Plioplateidae. Plioplateia triquetra.](image-url)
reduced or absent. Gnathopods ordinary, gnathopod 2 often enlarged in male or occasionally in both sexes. Article 2 of pereopods 3-7 usually rectilinear, rarely expanded on pereopods 5-7, never processiferous. Coxal gills simple, 3-5 pairs, oostegites 3-4 pairs. Pleopods with slender peduncle. Uropod 1 normal, uropod 2 variable, normal to absent, uropod 3 always reduced or absent, with or without small ramus. Telson subcircular or ovate, fleshy, often not very thick, occasionally fused to urosome.

**Relationship.** Differing from Iciliidae in the presence of only 0-1 ramus on uropod 3 (or uropod 3 absent), the simple (versus processiferous) article 2 of pereopods 5-7, slender peduncles of the pleopods, lack of gill on coxa 7, and fleshiness of the telson.

The elongation of urosomite 1 distinguishes Podoceridae from other corophioids. Phliantidae, Eophliantidae and Colomastigidae lack mandibular palps. Phliantidae have degraded molars and widely expanded peduncles of the pleopods.

This family is divided into four subfamilies by Laubitz (1983) and these are diagnosed in the following key. The diagnoses are based on the format of Corophioidea.


**Key to Subfamilies and Genera of Podoceridae**

(emended after Laubitz, 1983)

1. Head triangular or rectangular, shape special [Fig.118C]; mandibular palp slender, sparsely setose; pereopods 3-4 glandular; gills on pereonites 2-5 or 3-5; urosomite 1 longer than pleosomites 2 + 3 (Dulichiinae) ................................................................. 4

— Head anterodorsally elongate; mandibular palp heavy, strongly setose; pereopods 3 and 4 not glandular, gills on pereonites 2-4 or 2-6; urosomite 1 not longer than pleosomites 2 + 3 (Podocerinae) ................................................................. 2

— Head anterodorsally elongate; mandibular palp slender, poorly setose; pereopods 3 and 4 not glandular, gills on pereonites 3-6; urosomite 1 not longer than pleosomites 2 + 3, (antenna 2 much longer than body)..........(considered as Podocerinae) *Podobothrus*

2. Pereon strongly depressed; antenna 1 shorter than antenna 2; pereopods 3-7 similar; gills on pereonites 2-6; maxilla 1 inner plate reduced or absent (Podocerinae) ................................................................. 7

— Pereon cylindrical; antenna 1 longer than antenna 2; pereopods 3-7 of increasing length; if gills present on pereonites 2-6 then maxilla 1 inner plate setose ................................................................. 3

3. Pereopods 3 and 4 greatly reduced in size; anterior pereonites elongate, pleosome reduced; accessory flagellum short, of 1 article; gills on pereonites 2-4; maxilla 1 inner plate reduced (Neoxenodicinae, unique) ................................................................. *Neoxenodice*

— Pereopods 3 and 4 reduced in size; anterior pereonites not elongate, pleosome well developed, accessory flagellum long, of 4-5 articles; gills on pereonites 2-6; maxilla 1 inner plate well developed and setose (Xenodicinae, unique) ................................................................. *Xenodice*

4. Uropod 1 normal, uropod 2 vestigial; gnathopods 1-2 of equal size in male and female ................................................................. *Paradulichia*

— Uropods 1 and 2 normal; gnathopods 1 and 2 of equal size in female, grossly unequal in male ................................................................. 5
5. Gills on pereonites 3-5; basis of pereopods 3-4 greatly expanded; maxilla 2 inner plate without facial setae ................................................... Dyopedos

--- Gills on pereonites 2-5; basis of pereopods 3-4 not greatly expanded; maxilla 2 inner plate with facial setae ........................................... 6

6. Eyes large, strongly convex; pereopods 5-7 without propodal palm; maxilliped palp with short stout terminal article .......................................................... Dulichia

--- Eyes abnormal, poorly developed, or absent; pereopods 5-7 with propodal palm; maxilliped palp with long slender dactyl........................................ Dulichiopsis

7. Urosome with only 2 segments, uropod 2 without rami ...................................................... Laematophilus

--- Urosome with 3 urosomites, uropod 2 either biramous or absent ........................................ 8

8. Uropod 2 absent, uropod 3 present; maxilla 1 outer plate with 8 apical spines ................................................................. Leipsuropus

--- Uropod 2 biramous, uropod 3 present; maxilla 1 outer plate with 9 apical spines ................................................................. 9

9. Accessory flagellum 1-articulate ................................................................................................ Podocerus

--- Accessory flagellum absent ................................................................................................ Cyrtophium

_Cyrtophium_ Dana


_Type species._ Cyrtophium orientale Dana, 1853, monotypy.

_Diagnosis._ Poorly known. Like Podocerus. However, antennae long, nearly subequal, both slender, peduncular articles 2-3 of antenna 1 longest, accessory flagellum absent. [?Epistome produced anteriorly. Labrum incised, bilobed. Mandible normal, palp strong, article 3 clavate, shorter than 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes long, pointed or blunt. Inner plate of maxilla 1 short to vestigial, with or without 1 seta, outer plate with 9 spines, palp 2-articulate. Outer plates of maxilla 2 rather broad, inner plate with only sparse mediomarginal setae. Inner plate of maxilliped with distal spines, outer plate normal, reaching halfway to apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 short, with long nail and setae]. Coxae weakly contiguous, not spiniform.

[?Gnathopod 1 in male poorly subchelate, article 5 shorter than or as long as 6, weakly lobed]. Gnathopod 2 enlarged, article 5 much shorter than 6, lobed, article 6 dilated, dactyl long. [?Pereopods 3-4 longer than gnathopods, similar, with slender article 2, article 4 dilated, dactyls medium]. Pereopod 7 with narrow unlobed article 2, dactyl of pereopods 5-7 elongate, curved. [?Sternal processes of thorax absent. Coaxal gills undescribed, present on segments 7-26. Pleopods normal. Epimeron 3 not bisinuate]. Uropods 1-2 biramous, rami grossly unequal, inner much broader than outer, especially of uropod 2. [?Uropod 3 forming small leaf lacking rami, very short, obtuse distally, with few armandments]. Telson entire, as broader as, long, pyriform.

_Female._ Similar to male; oostegites on coxae 2-4.

_Sexual dimorphism._ Weak.

_Variables._ Article 3 of antenna 1 very small (C. minutum). Note that _C. laeve_ gnathopod 2 not like Podocerus because articles 4-5 free, article 5 with well-developed free lobe; and inner rami of uropods 1-2 as wide as outer rami.

_Relationship._ Very poorly described. Differing from Podocerus in the absence of accessory flagellum and the much broader inner rami of uropod 2 (and usually uropod 1).

_Species._ Cyrtophium ? laeve Heller, 1867 (Stebbing, 1906) [345]; C. ? minutum Haswell, 1879b, 1885b (Stebbing, 1906, 1910a) [781]; C. orientale Dana, 1853 (Stebbing,
**Habitat and distribution.** Marine, Mediterranean, south-eastern Australia, Strait of Singapore, shallow water, 3 species.

_Dulichia_ Krøyer
Figs 118C, 119G

_Dulichia_ Krøyer, 1845: 521.--Stebbing, 1906: 708.--J.L. Barnard,

1906: [657].


**Type species.** _Dulichia spinosissima_ Krøyer, 1845, monotypy.

**Diagnosis.** Body subcylindrical, dorsally corrugated or provided with elevations or teeth or humps, or carinate, urosome depressed, pereonite 1 very short, last 2 pereonites fused together; urosomites 2-3 coalesced, urosomite 1 elongate. Rostrum short to long, thorn-like,

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**Fig.118.** Podoceridae. _A._ _Laetmatophilus tuberculatus_; _B._ _Paradulichia typica_; _C._ _Dulichia spinosissima_; _D._ _Podocerus variegatus._
or vertically keeled, in type species all of anterior head thrust into large keel, ocular lobes obsolete, blunt, antennal sinus weak to deep. Eyes large. Antennae long, 1 longer than 2, both slender, peduncular article 3 of antenna 1 much longer than 1, articles 2-3 longest, accessory flagellum 2 to 3-articulate, main flagellar articles few. Antenna 2 peduncular article 3 short, flagellum with few articles. Epistome unproduced anteriorly. Labrum incised, broad, almost bilobed, or rounded, entire. Mandible normal, palp strong, slender, article 3 rectilinear, shorter than 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes long, pointed. Inner plate of maxilla 1 triangular, short, without setae, outer plate with 9 spines, palp 2-articulate. Plates of maxilla 2 of ordinary width, inner plate short, with mediofacial row of setae. Inner plate of maxilliped with distal spines, outer plate normal, not reaching apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 very short, with long nail and setae.

Coxae very small, short, discontinuous, of various sizes and shapes, even progressively from 2 to 4, spiniform, coxa 1 dilated, produced forward, coxa 2 larger than 1, often produced or dilated, coxa 4 not longer than coxa 1, not lobed posteriorly, coxa 5 as long as or somewhat longer than 4, coxae 6-7 not much smaller than anterior coxae. Gnathopods 1-2 diverse, gnathopod 2 greatly larger than 1, gnathopod 1 in male poorly subchelate, palm short, article 5 longer and broader than 6, poorly but broadly lobed, article 6 slender. Gnathopod 2 enlarged, subchelate, with article 2 dilated distally, article 5 much shorter than 6, lobed, article 6 dilated, sometimes with false chela, dactyl long.

Pereopods 3-4 normal, similar, with slender article 2, article 4 barely dilated, dactyls short. Pereopods 5-7 elongate, similar to each other, progressively scarcely longer, with linear article 2, not prehensile, dactyl of pereopods 5-7 short, curved, with several inner marginal setae. Sternal processes of thorax absent. Coxal gills present on segments 2-5. Pleopods normal. Epimeron 3

Fig.119. Podoceridae and Iciliidae. A, Laetmatophilus tuberculatus; B, Xenodice frauenfeldi; C, Icilius danae; D, Podocerus chelonophilus; E, Paradulichia typica; F, Neoxenodice caprellinoides; G, Dulichia spinosissma; H, Icilius punctatus.
Dulichiopsis

D. long. Eyes weak or absent. Antennae very long, nearly pereonites fused together; urosomites 2-3 coalesced, tuberculata Boeck, 1872.

Evans, 1934: length of peduncle on uropod 2 versus length of peduncle on uropod 1.

D. spinosissima McCloskey, 1951; nomen ramus naked.

D. diabolica Bousfield, 1973) (Laubitz, 1977)

Habitat and distribution. Marine, arctic-boreal, 10-682 m, occasionally on sea-urchin spines in detritus rods (tubes formed by amphipod), 5 species.


Type species. Dulichia nordlandica Boeck, 1871b, original designation.

Diagnosis. Body subcylindrical, urosome slightly depressed, smooth, pereonite 1 very short, last 2 pereonites fused together; urosomites 2-3 coalesced, urosomite 1 elongate. Rostrum short, ocular lobes obsolete, scarcely pointed, antennal sinus weak but long. Eyes weak or absent. Antennae very long, nearly subequal, perhaps 1 slightly longer than 2, both slender, peduncular article 3 of antenna 1 immensely longer than 1, article 3 longest, accessory flagellum 3-4 articulate, main flagellar articles few but long. Antenna 2 peduncular article 3 scarcely elongate, flagellar articles few but long. Epistome unproduced anteriorly. Labrum broad, fleshy, bilobed. Mandible normal, palp strong, very slender, article 3 rectangle, shorter than 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes short, blunt. Inner plate of maxilla 1 linguiform, short, without setae, outer plate with 9 spines, palp 2-articulate. Plates of maxilla 2 rather broad, inner plate with mediofacial row of setae.

Female. Coxae different from male, coxae 1-4 even, thus coxa 2 smaller than in male. Gnathopod 2 smaller than in male, propodis suborbicular, not sculptured. Oostegites broad, present on only segments 2-4.


Variables. Spination of body; spiniform shape of coxae (not spiniform in most species); acuity of head; shape of gnathopods 1-2; articulated lengths of pereopods 5-7; dactyl of pereopods 5-7 not denticulate (D. tuberculata); length of gill 2; spination of uropod 1; outer ramus of uropod 1 as long as peduncle and terminal spines short (D. spinossisima); length of peduncle on uropod 2 versus length of peduncle on uropod 1 or length of telson.

Relationship. The basic member of subfamily Dulichiinae. See Dulichiopsis, Dyopedos and Paradulichia.

Removals. See Dulichiopsis and Dyopedos.

Species. See Gurjanova (1951), Stephensen (1940b, 1942), D. falcata (Bate, 1857d) (Sars, 1895) (Laubitz, 1977) (Lincoln, 1979a) [200 + B]; D. malmgreni Jarzynsky, 1870, nomen nudum; (Della Vallee, 1893) [299]; D. rhabdoplastis McCloskey, 1970 (Laubitz, 1977) (Vader, 1978) [270]; D. spinossisima Kroyer, 1845 (Sars, 1895) (Boeck, 1871b) (Bousfield, 1973) (Laubitz, 1977) [260 + 220 + B]; D. tuberculata Boeck, 1871b (Sars, 1885) (Laubitz, 1977) (Lincoln, 1979a) (= D. curticauda Boeck, 1871b, Sars, 1895) (= D. septentrionalis Sars, 1879) [216 + B + 220]; D. wolffi Laubitz, 1977 (Just, 1980) [251].

Habitat and distribution. Marine, arctic-boreal, 10-682 m, occasionally on sea-urchin spines in detritus rods (tubes formed by amphipod), 5 species.
Relationship. Differing from Dulichia in the obsolescent to absent eyes, prehensile pereopods (rather minutely), and the elongate dactyl of the maxillipedal palp.

Species. See Gurjanova (1951), Laubitz (1977), Stephensen (1942, 1944c); D. abyssi (Stephensen, 1944c) [216BA]; D. barnardi Laubitz, 1977 [229B]; D. brevidactyla Ledoyer, 1986 [618A]; D. cyclops (Gurjanova, 1946) [206A]; D. macera (Sars, 1879, 1885) [220B]; D. nordlandica (Boeck, 1871b) (Sars, 1895) (?Ledoyer, 1977) [216B]; D. remis (J.L. Barnard, 1964d) [270B].

Habitat and distribution. Marine, arctic-boreal, deep-sea, 200-3229 m, (said to occur on sea-urchin species.

Dyopedos Bate


Type species. Dyopedos porrectus Bate, 1857d, selected by Laubitz, 1977.

Diagnosis. Body cylindrical, urosome depressed, smooth, pereonite 1 very short, last 2 pereonites fused together; urosomites 2-3 coalesced, urosome 1 elongate. Rostrum short, ocular lobes obsolescent, blunt, antennal sinuses almost absent. Eyes small to large. Antennae long, 1 longer than 2, both slender, peduncular article 3 of antenna 1 immensely longer than 1, article 3 longest, accessory flagellum 1-4 articulate, main flagellar articles very few but elongate. Antenna 2 peduncular article 3 short, flagellar articles few but elongate. Epistome unproduced anteriorly. Labrum broad, fleshy, bilobed. Mandible normal, palp strong, slender, article 3 rectolinear, shorter than 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes long, blunt. Inner plate of maxilla 1 short, without setae, outer plate with 9 spines, palp 2-articulate. Plates of maxilla 2 rather broad, inner plate with only mediomarginal setae. Inner plate of maxilliped with distal spines, outer plate normal, not reaching apex of palp article 2, with spines and notches on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 short, with long setae.

Coxae very small, discontiguous, of various sizes and shapes, even progressively from 1 to 4, occasionally spiniform, coxa 1 produced forward, coxa 4 not longer than coxa 1, not lobed, coxa 5 somewhat longer than 4, coxae 6-7 not smaller than anterior coxae. Gnathopods 1-2 diverse, gnathopod 2 greatly larger than 1, gnathopod 1 in male poorly subchelate, almost simple, article 5 long, almost linear, barely lobed, longer than 6, article 6 slender, scarcely almond-shaped. Gnathopod 2 enlarged, subchelate or chelate, with article 2 slender, article 5 much shorter than 6, lobed, article 6 dilated, sometimes with false chela, and/or process on posterodistal margin, dactyl long.

Pereopods 3-4 short, similar, with inflated article 2, article 4 scarcely dilated, dactyls short. Pereopods 5-7 not elongate, similar to each other, sometimes progressively longer, with linear article 2, not prehensile, pereopod 6 'usually' shorter than and different from pereopods 5 and 7, with broader article 2, dactyl of pereopods 5-7 short, curved, smooth. Sternal processes of thorax absent. Coxal gills present on segments 3-5. Pleopods normal. Epimeron 3 often bisinuate ventrally. Uropods 1-2 biramous, normal, rami unequal, longer (2) than or as long as (1) peduncle, peduncle of uropods 1-2 without ventrodorsal process. Uropod 3 absent. Telson entire, longer than broad, ovate, almost naked.

Female. Coxae different from male, coxae 1-4 even. Gnathopod 2 small, somewhat like gnathopod 1, almost simple, article 5 much shorter than 6, lobed. Oostegites broad, present on only segments 2-4.


Variables. Eyes protruding laterally or anteriorly or not, large and pigmented or small and pigmented; inner plate of maxilla 2 usually without facial setae but exception, contra Laubitz (1977) = D. knipowitschi; coxal cuspidation occurring, rarely immensely long, with long anterior tooth (D. monacanthus); proportions of gnathopods 1-2; gill 5 minute (D. porrectus); spines and setae of pereopods 5-7, dactyl denticulate or not; length of urosome 1; spines on ramal apices of uropod 1 present or not.

Relationship. Differing from Dulichia and Dulichioptis in the loss of gill 2, inflated article 2 of pereopods 3-4 and short pereopods 5-7.

Species. See Gurjanova (1951), Laubitz (1977), Shoemaker (1955a), Stephensen (1940b, 1942, 1944c); D. arcticus (Murdoch, 1885) [200a]; D. bispinus (Gurjanova, 1930b) (Stephensen, 1942) [200]; D. hirticornis (Sars, 1876, 1885) [220B]; D. knipowitschi (Gurjanova, 1933b) (Stephensen, 1942) (= D. aspina Stephensen, 1933b) [220 + B]; D. monacanthus (Metzger, 1875) (Sars, 1895) (Lincoln, 1979a) [200 + B]; D. normani (Sars, 1895) [238]; D. porrectus Bate, 1857d (Sars, 1895) (Chevreux & Fage, 1925) (Lincoln, 1979a) [200 + B]; D. spinosus (Stephensen, 1944c) [209B]; D. unispinus (Gurjanova, 1951) [290].

Habitat and distribution. Marine, arctic-boreal, 0-1200 m, 9 species.

Laetmatophilus Bruzelius

Figs 118A, 119A

Laetmatophilus Bruzelius, 1859: 10.—Stebbing, 1906: 695.—J.L.
Type species. *Leptomatophilus tuberculatus* Bruzelius, 1859, monotypy.

**Diagnosis.** Body dorsally corrugated, provided with elevations, teeth or humps, carinate or smooth, depressed, last 2-3 pereonites often fused together, pereonite 1 disjunct; urosomites 2-3 coalesced, urosomite 1 elongate. Rostrum short, ocular lobes obsolete, blunt, antennal sinus moderate. Eyes ordinary. Antennae elongate, nearly subequal, 1 scarcely shorter than 2, both of medium stoutness; peduncular article 3 of antenna 1 much longer than 1, articles 2 or 3 longest, accessory flagellum absent; main flagellar articles very few, first elongate. Antenna 2 peduncular article 3 scarcely elongate, flagellar articles few, first elongate. Epistome produced anteriorly. Labrum incised, broad, bilobed. Mandible normal, palp strong, article 3 clavate, shorter than 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes long, pointed. Inner plate of maxilla 1 short, without setae, outer plate with 9 spines, palp 2-articulate. Plates of maxilla 2 ordinary, inner plate with only sparse mediomarginal setae. Inner plate of maxillipeds with distal spines, outer plate reaching apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 very short, with long nail and setae.

Coxae very small, relatively short, 1-3 discontiguous, 3-7 contiguous, of various sizes and shapes, progressively elongate from 1 to 3, scarcely spiniform, coxa 1 not dilated, not produced forward, small in contrast to coxae 2-4, coxa 4 not longer than coxa 1, not lobed, coxa 5 usually shorter than 4, coxae 6-7 not smaller than anterior coxae. Gnathopods 1-2 diverse, gnathopods 1 greatly larger than 2, gnathopod 1 in male subchelate, palm short and oblique, article 5 longer than 6, unlobed, article 6 barely expanded. Gnathopod 2 enlarged, weakly subchelate, article 2 not dilated except apically, with article 4 incipiently merobrate, article 5 very short, unlobed, article 6 dilated, sometimes with false chela or process on posteroproximal margin, dactyl long.

Pereopods 3-4 longer than gnathopods, similar, with slender article 2, article 4 slightly dilated, dactyls long. Pereopods 5-7 similar to each other, not progressively longer, not prehensile, with linear article 2, dactyl long, curved. Sternal processes of thorax present. Coxal gills present on segments 2-6. Pleopods normal. Epimeron 3 not bisinuate. Uropod 1 biramous, normal, rami unequal, inner much longer than peduncle, peduncle without ventrodorsal process; uropod 2 forming small leaf lacking rami. Uropod 3 absent. Telson entire, short, broader than long, ovate.

**Female.** Coxae different from male, usually much longer. Gnathopod 2 with thicker less sculptured propodus. Oostegites broad, present on only segments 2-4.

**Sexual dimorphism.** Weak.

**Variables.** Dorsal body teeth; inner plate of maxilla 2 small (*L. dabberi*); shapes of gnathopods 1-2 and antennae.

**Relationship.** Differing from *Cyrtophium*, *Leipsuropus*, and *Podocerus* in the presence of only 2 urosomites and the lack of rami on uropod 2.


**Habitat and distribution.** Marine, cosmopolitan, 0-900 m, 11 species.

*Leipsuropus* Stebbing


**Type species.** *Cyrtophium parasiticum* Haswell, 1879a, monotypy.

**Diagnosis.** Body dorsally corrugated, provided with elevations, teeth or humps, carinate, depressed, pereonites 6-7 partially fused, urosomites free, urosomite 1 elongate. Rostrum short, ocular lobes obsolete, blunt, antennal sinus deep. Eyes ordinary. Antennae long, 1 shorter than 2, both stout; peduncular article 3 of antenna 1 much longer than 1, article 2 longest, accessory flagellum vestigial, main flagellar articles very few. Antenna 2 peduncular article 3 scarcely elongate, peduncle stout, flagellum composed of mainly 1 long article. Epistome produced anteriorly. Labrum incised, broad. Mandible normal, palp strong, article 3 clavate, shorter than 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes short, blunt. Inner plate of maxilla 1 vestigial, without setae, outer plate with 8 spines, palp 2-articulate. Outer plates of maxilla 2 rather broad, inner more narrow, with only mediomarginal setae. Inner plate of maxillipeds with distal spines, outer plate normal, reaching apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 very...
short, with long setae.

Coxae small, relatively short, weakly contiguous, of various sizes and shapes, progressively elongate from 1 to 4, scarcely spiniform, coxa 1 dilated, produced forward, small in contrast to enlarged coxae 2-4, coxa 2 larger than 1, dilated, coxa 4 longer than coxa 1, not lobed, coxa 5 shorter than 4, coxae 6-7 smaller than anterior coxae. Gnathopods 1-2 diverse, densely setose, gnathopod 2 greatly larger than 1, gnathopod 1 in male weakly subchelate, article 5 longer than 6, poorly lobed, article 6 expanded, dactyl long. Gnathopod 2 enlarged, subchelate, with article 2 dilated, article 5 oblussescent, unlobed, article 6 dilated, with false chela or process on posteroproximal margin, dactyl long.

Pereopods 3-4 normal, similar, with scarcely inflated article 2, article 4 barely dilated, dactyls short. Pereopods 5-7 similar to each other, not progressively longer, with linear article 2, dactyl of pereopods 5-7 medium, curved. Sternal processes of thorax absent. Coxal gills [undescribed, present on segments -2-6]. Pleopods normal. Epimeron 3 not bisinate. Uropod 1 biramous, normal, rami slightly unequal, longer than peduncle, peduncule without ventrodistal process; uropod 2 absent. Uropod 3 forming small setose leaf lacking rami. Telson entire, short, broader than long, ovate, almost pointed apically.

**Female.** Gnathopod 2 small but larger than 1, (but Dr Laubitz in litt. reports gnathopod 2 almost as large as in male in females) transversely subchelate, article 5 short, lobed, appendage poorly setose. Oostegites broad, present on only segments 2-4.

**Sexual dimorphism.** Strong. Gnathopod 2.

**Relationship.** Differing from *Cyttrophium, Laetmatophilus,* and *Podocerus* in the absence of uropod 2 though all 3 urosomites are free; also the outer plate of maxilla 1 bears 8 spines (versus 9).

**Species.** *Leipsuropus parasiticus* (Haswell, 1879a, 1885b) (Barnard & Drummond, 1981) [784].

**Habitat and distribution.** Marine, south-eastern Australia from Port Jackson to Westernport, 12-24 m, 1 species.

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**Neoxenodice** Schellenberg

*Fig.19F*


**Type species.** *Neoxenodice caprellinoides* Schellenberg, 1926b, monotypy.

**Diagnosis.** Body cylindrical, smooth, anterior pereonites elongate, pleosome reduced, urosomites free, urosomite 1 elongate. Rostrum short, ocular lobes obsolescent, blunt, antennal sinus deep. Eyes absent. Antennae of medium length, equal, both slender, peduncular article 3 of antenna 1 longer than 1, article 3 longest, accessory flagellum 1-2-articulate, main flagellar articles few. Antenna 2 peduncular article 3 elongate, flagellum with few articles. Epistome unproduced anteriorly. Labrum incised, broad. Mandible with reduced molar, palp strong, article 3 scarcely clavate, almost as long as 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes short, blunt. Inner plate of maxilla 1 short, with 1 thick apical seta, outer plate with 9 (?) spines, palp 2-articulate. Plates of maxilla 2 ordinary, inner plate with only mediomarginal setae. Inner plate of maxilliped with distal spines, outer plate short, not reaching halfway to apex of palp article 2, with small spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 short, with medium setae.

**Coaxae** very small, strongly discontiguous, progressively shorter from 1 to 4, coxa 1 not dilated, not produced forward, coxa 4 not lobed, coxa 5 at least as long as 4, coxae 6-7 not smaller than anterior coxae. Gnathopods 1-2 diverse, gnathopod 2 greatly larger than 1, gnathopod 1 in male subchelate, palm oblique, article 5 as long as 6, unlobed. Gnathopod 2 enlarged, weakly subchelate, with article 2 barely dilated, article 5 much shorter than 6, lobed, article 6 dilated, dactyl long.

Pereopods 3-4 tiny, similar, not glandular, with slender article 2, article 4 barely dilated, dactyls short. Pereopods 5-7 similar to each other, progressively longer, weakly prehensile, with almost linear article 2, pereopod 5 much shorter than pereopods 6-7, dactyl of pereopods 5-7 very long, curved, reaching up to area of prehensility on article 5. Sternal processes of thorax absent. Coxal gills present on segments 2-4. Pleopods [undescribed]. Epimeron 3 not bisinate. Uropods 1-2 biramous, normal, rami slightly unequal, longer than peduncle, peduncule of uropods 1-2 without ventrodistal process. Uropod 3 forming small setose leaf lacking rami. Telson entire, short, broader than long, ovate.

**Female.** Oostegites broad, present on coxae 3-4 or 2-4.

**Sexual dimorphism.** Absent.

**Variables.** Eyes well developed or not; minor variables in antennae, gnathopod 2 and uropods 1-2.

**Relationship.** In a monotypic subfamily and characterised by extreme reduction of pereopods 3-4, elongate anterior pereonites and reduced pleosome. Also differing from *Xenodocinae* in reduced accessory flagellum (2 versus 4+), and reduced, asetose inner plate of maxilla 1. Also from Dulichinae in head shape (see figures), with urosomite 1 not longer than pleonites 2-3 together and non-glandular
peropods 3-4.

**Species.** *Neoxenodice caprellinoides* Schellenberg, 1926b; (J.L. Barnard, 1962d) (Ledoyer, 1986) [870A]; *N. cryophile* Lowry, 1976 [876].

**Habitat and distribution.** Marine, Antarctica and Cape Basin, South Atlantic, 104-4893 m, 2 species.

**Paradulichia** Boeck

Figs 118B, 119E


**Type species.** *Paradulichia typica* Boeck, 1871b, monotypy.

**Diagnosis.** Body cylindrical, smooth, peropites 1-2 short, last 2 peropites fused together; urosomites 2-3 coalesced, urosomite 1 very elongate. Rostrum short, ocular lobes obsolescent, blunt, antennal sinus weak. Eyes large. Antennae elongate, 1 longer than 2, both slender, peduncular article 3 of antenna 1 much longer than 1, peduncular articles 2-3 longest, accessory flagellum 3-5 articulate. Antenna 2 peduncular article 3 short, main flagellar articles very few. Epistome [unproduced anteriorly]. Labrum broad, bilobed. Mandible normal, palp strong, very slender, article 3 rectilinear, shorter than 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes long, blunt. Inner plate of maxilla 1 triangular, large, without setae, outer plate with 9 spines, palp 2-articulate. Plates of maxilla 2 ordinary, inner plate slightly shortened, without mediomarginal setae. Inner plate of maxilliped with distal spines (fide Dr Laubitz but in illustrations appearing as setae), outer plate short, reaching halfway to apex of palp article 2, with only spine-setae on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 short, with long setae.

Coxa very small, short, not contiguous, not spiniform, coxa 1 not dilated, not produced forward, coxa 4 not longer than coxa 1, not lobed, coxa 5 somewhat longer than 4, coxae 6-7 not smaller than anterior coxae. Gnathopods 1-2 of subequal size, small, both with sublinear articles, gnathopod 1 in male poorly subchelate, article 5 long, linear, unlobed, palm short, gnathopod 2 subchelate, article 5 slightly longer than 6, poorly lobed, article 6 expanded.

Pereopods 3-4 longer than gnathopods, similar, with slender article 2, article 4 dilated, dactyls short. Pereopods 5-7 similar to each other, scarcely progressively longer, not prehensile, with linear article 2, dactyls short, curved. Sternal processes of thorax absent. Coxal gills present on segments 2-5. Pleopods normal. Epimeron 3 not bisinuate. Uropod 1 biramous, rami slightly unequal, much longer than peduncle, peduncle without ventrodistal process; uropod 2 very small, with only 1 ramus or forming small leaf lacking rami. Uropod 3 absent. Telson entire, as long as broad, ovate.

**Female.** Oostegites broad, present on only segments 2-4.

**Sexual dimorphism.** None.

**Variables.** Uropod 2 with 1-2 articles (*P. typica*).

**Relationship.** Differing from *Dulichia*, *Dulichiopsis*, and *Dyopedos* in the vestigial uropod 2 and in the similarity of male and female gnathopods.

**Species.** *Paradulichia secunda* Blake, 1929 (Laubitz, 1977) [254]; *P. typica* Boeck, 1871b (Sars, 1895) (Stephensen, 1940b) (Gurjanova, 1951) (= *P. spinifera* Gurjanova, 1946, 1951) (Laubitz, 1977) [200 + B].

**Habitat and distribution.** Marine, Arctic, North Atlantic south to Cape Cod region, 17-1102 m, 2 species.

**Podobothrus** Barnard & Clark

*Podobothrus* Barnard & Clark, 1985: 1048.

**Type species.** *Podobothrus bermudensis* Barnard & Clark, 1985, original designation.

**Diagnosis.** Body posterodorsally provided with humps, carinate, slightly depressed, last 2 mesosome segments fused together; urosomites free, together not longer than pleosome, 3 coalesced with telson, urosomite 1 elongate. Rostrum absent, ocular lobes obsolescent, blunt, antennal sinus deep. (Head as long as peronites 1-2 together). Eyes very large, pigmentless, on lateral head bulges. Antennae immensely long, 1 shorter than 2, both slender, peduncular article 3 of antenna 1 much longer than 1, article 3 longest, accessory flagellum 1-articulate, main flagellar articles very few but each elongate. Antenna 2 peduncular article 3 scarcely elongate, flagellar articles few but each elongate. Epistome unproduced anteriorly. Labrum subrounded, weakly incised, broad. Mandible normal, palp weak, slender, article 3 rectilinear, shorter than 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes long, pointed. Inner plate of maxilla 1 vestigial, without setae, outer plate with 9 spines, palp 2-articulate. Outer plates of maxilla 2 rather broad, inner short and narrow, inner plate with only sparse mediomarginal setae. Inner plate of maxilliped with distal spines, outer plate normal, not reaching apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 short, with long
Coxae very small, short, contiguous, alike, progressively elongate from 1 to 4, not spiniform, coxa 1 not dilated, not produced forward, coxa 4 longer than coxa 1, not lobed, coxa 5 as long as 4, coxae 6-7 not smaller than anterior coxae. Gnathopods 1-2 diverse, gnathopod 2 greatly larger than 1, gnathopod 1 in male almost simple, article 5 long, almost linear, largely lobed basally, as long as 6, article 6 very slender, dactyl long. Gnathopod 2 enlarged, weakly subchelate, with article 2 not dilated, article 5 shorter than 6, more slender than 6, unlobed, article 6 dilated, dactyl fitting oblique palm.

Pereopods 3-4 longer than gnathopods, similar, with slender article 2, article 4 not dilated, dactyls long. Pereopods 5-7 similar to each other and to pereopods 3-4, with linear article 2, dactyl of pereopods 5-7 long, curved. Sternal processes of thorax absent. Coxal gills present on segments 3-6. Pleopods normal. Epimeron 3 not bisinuate. Uropods 1-2 biramous, normal, rami strongly unequal, longer than peduncle, peduncles without ventrodorsal process. Uropod 3 forming small leaf lacking rami, almost naked. Telson entire, as broad as long, ovate, spinose.

Female. Unknown. Oostegites [?moderately narrow, present on segments 72-5].

Sexual dimorphism. Unknown.

Relationship. Differing from Podocerus in the smaller disjunct coxae 3-7, feeble gnathopods, much more elongate spines on rami of uropods 1-2, thin, poorly setose mandibular palp and poorly setose but immense antennae. This genus does not fit some precepts of Laubitz' key to Podoceridae reproduced herein because Podobothrus is clearly a member of Podocerinae but has a poorly setose mandibular palp and no gills on coxa 2. Differing from Cyrtophium in presence of accessory flagellum, short antenna 1; from Xenodice in short (relative to antenna 2) antenna 1, depressed body, lateral ocular bulges and more strongly disjunct coxae; and from Neoxenodice in the long pereopods 3-4 and fused pereonites.

Species. Podobothrus bermudensis Barnard & Clark 1985 [367Z].

Habitat and distribution. Marine, Bermuda, seacave, 1 species.

Podocerus Leach

Figs 118D, 119D


Platophium Dana, 1852b: 309.-Dana, 1853: 837 (Platophium brasiliense Dana, 1853, monotypy).

Dessicocera Haswell, 1885b: 107 (Cyrtophium dentatum Haswell, 1879b (= Cyrtophium cristatum Thomson, 1879a), here selected).

Type species. Podocerus variegatus Leach, 1814b, monotypy.

Diagnosis. Body often dorsally corrugated or provided with elevations, teeth, humps, or carinate or smooth, depressed, last 2-3 pereonal segments often fused, urosomite 1 elongate. Rostrum short, ocular lobes short, blunt, antennal sinus deep. Eyes large to weak, often bulging laterally. Antennae of medium to great length, 1 shorter than 2, 1 slender, antenna 2 stout; peduncular article 3 of antenna 1 longer than 1, article 2 longest, accessory flagellum 1 to 2-articulate, main flagellar articles very few. Antenna 2 peduncular article 3 scarcely elongate, peduncle moderately stout, flagellum short, poorly articulate. Epistome produced anteriorly. Labrum incised, bilobed. Mandible normal, palp strong, article 3 clavate, shorter than 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes long, pointed or blunt. Inner plate of maxilla 1 short to vestigial, with or without 1 seta, outer plate with 9 (?)11 spines, palp 2-articulate. Outer plates of maxilla 2 rather broad, inner plate with only sparse mediomarginal setae. Inner plate of maxilliped with distal spines, outer plate normal, reaching halfway to apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 short, with long nail and setae.

Coxae very small, short, weakly disjunct, of various sizes and shapes, not progressively elongate from 1 to 4, often spiniform, coxa 1 dilated, produced forward, coxa 2 shorter or longer than 1, often produced, coxa 4 not longer than coxa 1, not lobed, coxa 5 as long as 4, coxae 6-7 not much smaller than anterior coxae. Gnathopods 1-2 diverse, gnathopod 2 greatly larger than 1, gnathopod 1 in male poorly subchelate, article 5 shorter than or as long as 6, weakly lobed. Gnathopod 2 enlarged, weakly subchelate or essentially simple, very setose, with article 2 barely dilated, with article 4 enlarged, incipiently merochelate, extended and fused distally along posterior margin of article 5, article 5 much shorter than 6, mostly fused to 4 or cryptic, article 6 dilated, dactyl long.

Pereopods 3-4 longer than gnathopods, similar, with slender article 2, article 4 dilated, dactyls medium. Pereopods 5-7 similar to each other, progressively slightly longer or pereopod 6 longer, pereopods 5-7 with narrow to broad unlobed or barely lobed article 2, dactyl of pereopods 5-7 medium, curved. Sternal processes of thorax absent. Coxal gills [undescribed, present on segments 72-6]. Pleopods normal, Epimeron 3 not bisinuate. Uropods 1-2 biramous, rami grossly unequal, inner much longer than (2) or as long as (1) peduncle, peduncle of uropods 1-2 with or without ventrodorsal process, that of uropod 2 smaller. Uropod 3 forming small leaf lacking rami, very short, obtuse distally, with few armaments. Telson entire, short,
broadern than long, ovate or semicircular, spinose.

**Female.** Gnathopod 2 smaller, merocelate, carpus distinct but subcryptic, propodus short and inflated. Oostegites broad, present on segments 2-5 or 2-4.

**Sexual dimorphism.** Strong. Gnathopod 2.

**Variables.** Lateral ocular lobes often bulging laterally; shape and setosity of male and female gnathopods 1-2; article 5 of gnathopod 1 longer than 6 maxilla 1. Because of the presence of 3 pairs of uropods, accessory

P. schieckei J.L. Barnard, (Stephensen, 1908c) (Nagata, 1960) [395]; “species” Goddard, 1984 [268, mimic to nudibranch].

**Habitat and distribution.** Marine, cosmopolitan, 0-750 m, 33 species.

**Xenodice** Boeck, 1871

Fig.119B

**Type species.** *Xenodice frauenfeldi* Boeck, 1871b, monotypy.

**Diagnosis.** Body cylindrical, smooth, mesosome segments free, urosomites free, together shorter than pleosome, urosomite 1 elongate. Rostrum short, ocular lobes short, weakly pointed, antennal sinus moderate. (Head as long as pereonites 1-2 together). Eyes weak. Antennae long, 1 slightly longer than 2, both slender, peduncular article 3 of antenna 1 much longer than 1, article 3 longest, accessory flagellum 4 to 5-articulate. Antenna 2 peduncular article 3 scarcely elongate. Epistome unproduced anteriorly. Labrum broad, fleshy, bilobed. Mandible normal, palp strong, article 3 thin, clavate, shorter than 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes long, blunt. Inner plate of maxilla 1 triangular, with row of medial setae, outer plate with 9 spines, palp 2-articulate. Plates of maxilla 2 ordinary, inner plate with only mediomarginal setae. Inner plate of maxilliped 2, not reaching apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 short, with long setae.

Coxae very small, short, discontinuous, alike, even, not spiniform, coxa 1 not dilated, not produced forward, coxa 4 longer than coxa 1, not lobed, coxa 5 as long as 4, coxae 6-7 not smaller than anterior coxae. Gnathopods 1-2 alike, of subequal size, small, densely setose, gnathopod 2 slightly dominant, gnathopod 1 in male weakly subchelate, article 5 slightly longer than 6, lobed, article 6 more slender than 5, dactyl long. Gnathopod 2 barely enlarged, subchelate, with article 2 not dilated, article 5 as long as 6, lobed, article 6 slightly dilated, with false chela, dactyl ordinary.

Pereopods 3-4 longer than gnathopods, similar, with slender article 2, article 4 scarcely dilated, dactyls


**K.K. Barnard: Marine Gammaridean Amphipoda 665**

**Barnard & Karaman: Marine Gammaridean Amphipoda 665**
medium. Pereopods 5-7 similar to each other, elongate, progressively longer, not prehensile, with linear article 2, articles 4-6 of pereopod 7 elongated, dactyl of pereopods 5-7 short to medium, curved. Sternal processes of thorax absent. Coxal gills present on segments 2-6. Pleopods normal. Epimeron 3 bisinuate. Uropods 1-2 biramous, normal, rami slightly unequal, longer than (2) or as long as (1) peduncle, peduncle of uropod 1 with vestigial ventrodistal process. Uropod 3 forming tiny naked leaf lacking rami. Telson entire, as broad as long, ovate, almost naked.

**Female.** Gnathopods smaller, gnathopod 1 with article 5 slender, longer than 6, unlobed, on gnathopods 1-2 as long as 6 and more distinctly lobed than in male. Oostegites narrow, present on only segments 2-4.

**Sexual dimorphism.** Weak.

**Relationship.** Differing from other dulichiids by possession of plesiomorphic characters: well-developed accessory flagellum, strongly setose inner plate of maxilla 1, slender oostegites and better development of pleosome with larger more projecting epimera.

**Species.** *Xenodice frauenfeldti* Boeck, 1871b (Sars, 1895) (Stephensen, 1940b, 1942, 1944c) (Gurjanova, 1951) [216 + B].

**Habitat and distribution.** Marine, North Atlantic, North Sea, Kattegat, Arctic Ocean, 56-1270 m, 1 species.

**Fig.120.** Pseudamphilochidae. *Pseudamphilochus shoemakeri.*
Maxilliped ordinary but inner plate slightly broader than normal.

Gnathopods small, alike, carpus short, weakly lobate, propodus longer, moderately expanded, palm almost transverse. Pereopods 3-7 ordinary. Outer ramus of uropod 1 strongly reduced, of uropod 2 scarcely shorter than inner; peduncle of uropod 3 not greatly elongate (unusual), inner ramus half as long as outer (unusual). Telson elongate, leaf-like, apex sharp but telson split more than one third its length (unusual).

Relationship. Relatively good ancestral kind to other amphilochids because of strong rostrum, round eye, mouthparts, hammer-like small gnathopods of general form, and elongate telson (but split).

The unusual characters of the diagnosis spoil what would otherwise be a tight definition of amphilochoidids. The type genus needs extensive study. Though coxa 1 is broadened, Pseudamphilochus differs from Stilipedidae (= Astyridae) in the propodus of the gnathopods being larger than the carpus and is not an ilhimediid because no anterior coxa is acuminate.

Pseudamphilochus Schellenberg

Fig. 120

Pseudamphilochus Schellenberg, 1931: 92.

Type species. Pseudamphilochus shoemakeri Schellenberg, 1931, monotypy.

Diagnosis. With the characters of the family.

Species. Pseudamphilochus shoemakeri Schellenberg, 1931 [833].

Habitat and distribution. Marine, South Georgia, 12-15 m, 1 species.

SALENTINELLIDAE Bousfield, 1977

[see Barnard & Barnard (1983)]

SEBIDAE Walker, 1908


See Anamixidae, Clarenciidae, Lysianassidae, Liljeborgiidae, Leucothoidae and Pagetinidae.

Description. Body compressed, smooth or weakly carinate, urosomites free or 2-3 coalesced. Head ordinary, lateral lobes well developed but eyes usually absent. antennae 1-2 reaching equally; article 2 of antenna 1 generally longer than article 1; flagella of both antennae short, generally not longer than longest article of respective peduncle. Epistome and labrum separate, epistome dominant, labrum weakly excavate below. Mandibular incisor broad, toothed, lacinia mobilis present, several thick rakers present, molar bulbous, weak, almost smooth, with spine, palp attached opposite molar, article 3 short, barrel shaped, scarcely setose. Labium with widely separated outer lobes, well-developed blunt mandibular lobes, inner lobes barely evident but with middle notch and separating outer lobes widely. Inner plate of maxilla 1 tiny, with few apical setae, outer plate with about 5-8 spines, palp elongate, 1-articulate; plates of maxilla 2 feeble, poorly setose; plates of maxilliped of medium size, poorly armed, palp stout, 4-articulate, dactyl long, falcate.

Coxae 1-4 large, coxa 1 generally largest, others decreasing slightly in progression, coxa 4 weakly lobate and excavate posteriorly, coxa 5 slightly shorter than 4. Carpus of gnathopod 1 thick, lobate, propodus broad, carpus of gnathopod 2 generally thin, propodus usually thin and longer than carpus in both pairs. Pereopods short, 3-4 ordinary, article 2 of pereopods 5-7 expanded, weakly lobate, weakly setulate. Gills 2-6, sac-like; oostegites very slender or of medium expansion, weakly setose.

Pleopods ordinary, each ramus with 3-5 articles. Urosome short. Epimera ordinary. Outer rami of uropods 1-2 slightly shortened, rami somewhat thick and stubby; poorly armed; peduncle of uropod 3 short, rami long, tipped with spine or article 2. Telson of regular length, entire.

Sexual dimorphism. Weak to absent, occasionally male gnathopod 1 with distinctly sculptured palm.

Relationship. Differing from Lysianassidae in the long peduncle of antenna 1, with article 2 elongate. When uropod 3 is uniramous in Lysianassidae it is never elongate, otherwise all Lysianassidae have biramous uropod 3.

The Anamixidae, Liljeborgiidae and Leucothoidae have biramous uropod 3.

The Pagetinidae have vestigial outer plates on the maxillipeds.
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Key to Genera of Sebidae

1. Article 3 of gnathopod 2 elongate; coxa 4 weak, poorly lobed, poorly excavate; maxilla 2 with 2 plates

   Seba

   — Article 3 of gnathopod 2 ordinary, short; coxa 4 ordinary, large, with broad quadrate posterior lobe and small posterodorsal excavation; maxilla 2 with 1 plate

   2

2. Gnathopod 2 much smaller than gnathopod 1, carpus unlobate, article 1 longer than article 2, head protruding anteroventrally and sinus absent

   Relictoseborgia

   — Gnathopods scarcely diverse, carpi lobate, article 1 as long as article 2, head not protruding and with antennal sinus

   Seborgia

Seba Bate

Figs 121B.C

Teraticum Chilton, 1884: 257 (Teraticum typicum Chilton, 1884, monotypy).
Grimaldia Chevreux, 1889a: 284 (Grimaldia armata Chevreux, 1889a, original designation).

Type species. Seba innominata Bate, 1862, monotypy.

Diagnosis. Labium with inner lobes indistinct and fused to outer lobes. Palp of maxilla 1 1-articulate. Maxilla 2 ordinary, with 2 plates. Coxa 4 scarcely the largest or not the largest, not orthodox, all posterior margin excavate, therefore posteroventral lobe feeble. Gnathopods diverse, gnathopod 1 much the larger, subchelate or cheleto, propodus broad, gnathopod 2 strongly chelate with elongate article 3, carpus and propodus very slender. Urosomites 2-3 fused together. Oostegites moderately expanded, generally with 5-7 apical and subapical setae.

Description. Body slender. Rostrum small, anteroventral cephalic sinus well developed, corner sharp, not extended. Antennae 1-2 of medium length, extending equally, peduncular article 2 usually longer than article 1, article 3 much shorter, accessory flagellum 2-articulate, article 2 short, flagellum of antenna 2 very short. Labrum broader than long, weakly to scarcely bilobed. Incisor strong, toothed, laciniae mobiles well developed, rakers several, molar feeble, usually forming broad smooth hump or obsolete, nontriturative; palp large, article 2 elongate, articles 1 and 3 short, often equal in length or article 3 much longer than 1, setae of article 2 sparse or absent, of 3 mostly E, one to few. Inner plate of maxilla 1 of medium length, naked or with setule, blunt, outer plate with 6-8 (?9) spines, palp elongate. Maxilla 2 formed of 2 articulate weakly setose similar plates, occasionally inner very short. Plates of maxilliped moderately developed, poorly setose, outer usually with sparse spines medially, palp long, 4-articulate, dactyl unguiform, nail fused or accessory setule present.

Coxa 1-4 of medium length, not necessarily increasing in length towards coxa 4, coxa 1 weakly or scarcely dilated, not broader than coxae 2-3, coxa 4 not very large, poorly lobate and poorly excavate posteriorly, coxae 5-7 moderately shortened and slightly lobate. Carpus of gnathopods short to medium, first lobate, second unlobate, propodus chelate, usually diverse, first very large, broad, second very slender and elongate, palms strongly protuberant or palm on gnathopod 2 weaker and often strongly sculptured, dactyls large, fitting palm, carpus and posterior margin of propodus on gnathopod 1 usually with 1 clump of setae each or more broadly setose, of gnathopod 2 sparsely setose to naked. Pereopods 5-7 scarcely divergent though pereopod 7 occasionally with diverse article 2; article 4 often expanded and lobate. Coxal gills 2-6, sac-like or thin. Oostegites of medium breadth and medium setation.

Uropods weakly spinose or almost naked, outer rami of uropod 1 (rarer uropod 2) often shortened. Peduncle of uropod 3 short, ramus much longer than peduncle, with apical spine on article 2. Telson linguiform, weakly longer than broad, entire, rounded or weakly pointed apically, poorly setulose.

Sexual dimorphism. Male gnathopod 1 often with
more sculptured palm than female.

**Variables.** Article 3 of mandibular palp as long as article 2 (S. hirsuta), shorter than 2 but longer than 1 (S. aloe), only as long as 1 (S. ekepuu); article 3 of maxillipedal palp produced (S. antarctica identification of K.H. Barnard, 1932); palm of gnathopod 1 diverse within one species, parachelate or transverse, teeth 2 or 3 (S. saundersi identification of Schellenberg, 1931); dactyl of gnathopod 1 with mid inner tooth (S. typica); palm of gnathopod 1 not chelate (S. hirsuta); article 4 of pereopods 5-7 thin or expanded within 1 species (male and female S. aloe and S. subantarctica); outer ramus of uropod 1 shortened (most species), of uropod 2 shortened (several), of uropod 2 not shortened (S. armata, S. dubia).

**Relationship.** More strongly advanced than Seborgia in the more diverse and strongly chelate gnathopods, poorly developed coxa 4, elongate article 3 on gnathopod 2, fused urosomites but possibly more plesiomorphic in the lack of diversity in coxae 1-3 which in Seborgia have coxa 1 broader than coxae 2-3, a character of many families of amphipods such as Liljeborgiidae, and in the normal maxilla 2.

**Species.** See Karaman (1971b); S. aloe Karaman, 1971e (Bellan-Santini, 1974, 1984) [340BA]; S. antarctica Walker, 1906a, 1907 (K.H. Barnard, 1930, 1932) (Schellenberg, 1931) (Nicholls, 1938) (Holman & Watling, 1983) [870 + 1]; S. armata (Chevreux, 1889a) (Chevreux, 1900a) (Chevreux & Fage, 1925) [240B]; S. chiltoni Moore, 1987 (? = S. typica identification of Chilton, 1921d, 1924a; Ledoyer, 1978b, 1986) [783 + ?690]; S. dubia Schellenberg, 1926a (Holman & Watling, 1983) [881B]; S. ekepuu J.L. Barnard, 1970a (Ledoyer, 1979a, 1986) [600]; S. georgiana Schellenberg, 1931 [833]; S. gloriosae Ledoyer, 1986 [618B]; S. hirsuta Ledoyer, 1978b [783 + 697]; ?S. innominata Bate, 1862 (Karaman, 1971b) [dubious] [348]; S. saundersi Stebbing, 1875b, 1888 (= S. chelata

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**Fig. 121.** Sebidae. A, Seborgia minima; B, Seba armata; C, Seba saundersi.
Habitat and distribution. Marine, cosmopolitan but stronger in southern oceans, 0-1900 m, 15 species.

**Seborgia** Bousfield

Fig.121A


**Type species.** *Seborgia minima* Bousfield, 1970, original designation.

**Diagnosis.** Labium with discrete fleshy inner lobes. Palp of maxilla 1 2-articulate. Maxilla 2 composed of only 1 plate. Coxa 4 much the largest, with orthodox broad posterior lobe and small posterodorsal excavation. Gnathopods alike or weakly diverse, weakly chelate; article 3 of gnathopod 2 short. Urosomites separate. Oostegites rectilinear, with 3 or fewer apical setae.

**Description.** Body ordinary to slender. Anteroventral cephalic sinus well developed, corner neither sharp nor extended. Labrum broader than long, weakly bilobed. Incisor strong, toothed, laciniae mobiles well developed, rakers several, molar feeble, conical, with seta, nontriturative; palp large, article 2 elongate, articles 1 and 3 short, subequally long, setae of article 2 = group of several inner middle, of 3 = mostly E, few. Inner plate of maxilla 1 short, naked or with setule, outer plate with 7 spines, palp article 1 elongate. Maxilla 2 formed of attenuate narrow extension from basal plate, poorly setose. Plates of maxilliped moderately developed, poorly setose, lacking spines, palp long, 4-articulate, dactyl unguiform, with nail.

Coxae 1-4 elongate, slightly longer progressively towards coxa 4, coxa 1 dilated, broader than coxae 2 or 3, coxa 4 very large and ordinary, coxae 5-7 very short and poorly lobed. Carpus of gnathopods very short, lobate, propodus broad and expanding distally, palms transverse or weakly parachelate, dactyls large, fitting palm, carpus and posteroproximal parts of propodus setose and often pubescent. Pereopods 5-7 scarcely divergent. Coxal gills 2-6, sac-like, with peduncles. Oostegites very slender, poorly armed.

Uropods weakly spinose, rami lacking apical spines, outer rami of uropods 1-2 shortened. Peduncle of uropod 3 weakly elongate, ramus as long as peduncle, with subapical notch (type) as if apical spine partly fused to base. Telson linguiform, weakly longer than broad, entire, rounded or obtuse apically, poorly setulose.

**Variables.** Rostrum large; antenna 1 longer than 2 (*S. schiecki*).

**Relationship.** Much more primitive than *Seba* in the diagnostic characters. The diversity in the 2 species, though moderate, does not warrant generic distinction because both species share the strong diagnostic differences from *Seba*. *Relictoseborgia* differs from *Seborgia* in the smaller gnathopod 2 with poorly lobate carpus, longer ramus of uropod 3 and slightly different shape of head at anteroventral angle.

**Species.** *Seborgia minima* Bousfield, 1970 [595F]; *S. schiecki* Ruffo, 1985a [662Q].

Habitat and distribution. Freshwater, epigean from Lake Tegano on Rennel Island in Bismarck Archipelago, and Andaman Island, interstitial near the sea, 2 species.

**Relictoseborgia** Karaman


**Type species.** *Seborgia relicta* Holsinger in Holsinger & Langley, 1980, original designation.

**Diagnosis.** Labium with discrete fleshy inner lobes. Palp of maxilla 1 2-articulate. Maxilla 2 composed only of one plate. Coxa 4 much the largest, with orthodox broad posterior lobe and small posterodorsal excavation. Gnathopod 1 weakly chelate, much larger than gnathopod 2 in both sexes; article 3 of gnathopod 2 short. Urosomites separate. Oostegites rectilinear, with 2-4 setae.


**Species.** *Relictoseborgia relicta* (Holsinger in Holsinger & Langley, 1980) (Karaman, 1982a) [184].

Habitat and distribution. Freshwater, subterranean, Edwards Aquifer, Texas, USA, 1 species.
**STEGOCEPHALIDAE** Dana, 1855

**Diagnosis.** Body laterally compressed but from lateral view appearing stout and globular, coxae 1-4 forming lateral shield with deeply convex ventral margin, coxa 4 very large, coxae 2-3 narrowest and thinly rectangular, coxa 1 shortest, broad basally but strongly tapering, acuminate, but not covered by following coxae. Antennae very short, peduncle of antenna 1 very short, articles 2-3 scarcely developed, accessory flagellum 1-2 articulate. Mandible without molar and palp. Gnathopods feeble, simple. Article 2 of pereopod 5 hidden behind coxa, rectolinear.

See Amphiloichidae, Lysianassidae, Stenothoidae and Stupipedidae.

**Description.** Body slick, rarely carinate. Head short, large area covered by coxa 1. Eyes absent or never conspicuous. Article 1 of primary flagellum on antenna 1 often elongated and heavily armed with aestheascs or filaments. Mouthparts usually projecting as very broad conical bundle ("parasitic"); epistome often carinate. Labrum highly variable, elongate, broad, entire or incised. Mandible variable, of ordinary dimensions and toothed at narrow incisor or increasingly broadened, flattened, with broad crenellated or smooth incisor, laciniæ mobiles present or absent in varying degrees. Outer lobes of labium usually separated by strong medial gape, inner lobes absent, mandibular lobes usually well developed. Maxilla 1 strong, inner plate large and well setose medially, outer plate with diverse apical spines and often medial armament largely setae or "hairs", palp variable, large or small, 1-2 articulate. Maxilla 2 with large inner plate strongly setose medially, outer plate smaller or absent, often short and appressed to inner or elongate and attached in geniculate fashion to basolateral lobe of inner plate, apical spine-setae often hooked or hooded. Inner plate of maxilliped variable, usually broad and short, often excavate apically and with medial alae, outer plate very large, broad and mostly poorly armed, palp subdominant, 3-4 articulate, dactyl weak, article 2 occasionally with apicomical process.

Coxa 1 much shorter than 2 but matching its ventral crescentic curve; coxa 4 strongly excavate, coxae 5-7 short and fitting mould of excavation on coxa 4, coxae 6-7 rarely vestigial (Tetradeion). Gnathopods generally with articles 3-7 not broader than article 2, article 3 occasionally elongate on gnathopod 2 but propodus not mitten shaped, article 4 short, rigid, with carpus attached eccentrically by flexible joint, propodus usually as long as or longer than carpus, narrow, tapering, usually lacking palm, carpus occasionally short and broad or diverse between pairs in same taxon, dactyls short, smooth, weakly ("simple") or strongly pectinate on inferior margins; gnathopods thus forming small pointed probes.

Pereopods 3-4 ordinary or rarely prehensile. Article 2 of pereopod 5 always rectilinear, that of pereopod 6 often rectilinear, weakly expanded or strongly expanded but almost never as strongly expanded as that on pereopod 7, expansion of 6 often of generic value but sometimes bridged by intermediate taxa; article 2 of pereopod 7 broad, posteroventrally lobate, lobe truncate, rounded or pointed, articles 3-7 of pereopods 5-7 together short, alike, occasionally reduced to 6 or 3 articles on pereopod 7. Coxal gills usually 2-7, oostegites narrow to medium.

Epipimeron 1 usually rounded, epimera 2-3 rounded, quadrate, weakly toothed or epimeron 3 with strong midposterior tooth. Urosomites 2-3 coalesced or free. Uropods 1-3 usually similar, peduncles elongate, rami extending equally, peduncle of uropod 3 often longer than rami, outer occasionally 2-articulate, or rami vestigial or absent (Tetradeion and Stegophippiella). Telson short relative to body but in context occasionally appearing elongate (longer than broad), often feebly short, entire, often pointed, or cleft and pointed, cleft never reaching base.

**Variables.** Coxal shield in Parandaniexis reduced sufficiently to confound identification, possibly mistaken as Amphiloichidae, with coxa 1 very small (but not hidden) and coxa 4 altered to complex crescent and spike with loss of dominance.

**Relationship.** The loss of both palp and molar on the mandible is approached only in the Philiantidae, Eophliantidae, Temnophliantidae and Dexaminidae (Prophliantinae) but in those taxa the accessory flagellum is absent. The characteristic globular shape from side view distinguishes the family from most other families but the characteristic shape of coxae 1-4 is especially distinctive from globular lysianassids.

The close resemblance to lysianassids, although disjoined by the distinctive coxal shield of Stegocephalidae, is found in the frequent elongation of article 3 on gnathopod 2, the slick body, the short antennae, the resemblance of maxillae in setosity to cyphocarid-group genera and the small head. The absence of molar and palp on the mandible is an ultimate distinction though confounded by several aberrant lysianassids. Most stegocephalids would key to Stephensenia in Lysianassidae but that genus appears to be a fossorial amphipod quite distinct from the stegocephalids in its setosity and non-conformity of anterior coxae. Some stegocephalids like Andanioites resemble some lysianassids like Aristias in the setosity of maxillae 1 to 2 but the stegocephalids have coxa 1 fully free and visible and coxae 2 to 3 are narrowed.

Some Stenothoidae lack a mandibular palp and all have a shield-like coxa 4 but coxa 1 is always very small and hidden by coxa 2, the accessory flagellum is vestigial or absent, uropod 3 is uniramous and the outer plate of the maxilliped is small.

The Amphiloichidae have a very small coxa 1 partially hidden by following coxae but the mouthparts project in a quadrate bundle.

The Pseudamphiloichidae have mandibular palps.

The loss of mandibular structure and the eelytriform shape of the mandible help distinguish Stegocephalidae
from Iphimediidae, many of which have conically grouped mouthparts, and the beginnings of a lateral shield, with acuminate coxa 1 but coxa 1 is broader in Stegocephalidae. Most Iphimediidae have narrow inner plates on maxilla 2 and one or both pairs of gnathopods of Iphimediidae lack the rigid plan of Stegocephalidae, being either subchelate, chelate, or flagellar. Most Iphimediidae seem to have a much longer article 2 of antenna 1 than do the Stegocephalidae.

There is much resemblance of Stegocephalidae to the Stilipedeidae (= Astyridae), especially in the stilipedid rudiments of a coxal shield with coxa 1 broadened, the foliaceous maxillae but which, unlike Stegocephalidae have the palp of maxilla 1 and the outer plate of maxilla 2 but not the inner plate of maxilla 1 foliaceous; the similar maxilliped with enlarged outer plate, the frequently gaping lower lip lacking inner lobes, the probing gnathopods, frequently incised upper lip, and short peduncle of antenna 1. But Stilipedeidae have elongate antennal flagella, elongate pereopods 5-7, mandibular palps, conspicuous heads, and often have molars. Pseudandaniexis mixtus (described as Parandaniexis mixtus) is removed to Alexandreida in Stilipedeidae by Watling & Holman (1980).

No Pardaliscidae have the long shield formed of diverse coxae 1-4.

Most Stegocephalidae have strongly parasitic mouthparts and most have the globular body form of pelagic hyperids but in fact most stegocephalid species appear to inhabit benthic sessile invertebrates.

**Taxonomy.** The classification of genera remains cloudy especially in Phippsiella, Stegocephalus, Stegocephalopsis, Stegocephalooides and 2 anomalous taxa Stegocephalooides camoti and Stegocephalopsis katalia. A problem unknown to Stebbing (1906) and overlooked by Schellenberg (1925b, 1929b), Gurjanova (1951) and J.L. Barnard (1969c) is that the type species of Stegocephalopsis, Cancer ampulla Phipps, has a 1-articulate palp on maxilla 1 according to Bruggen (1909). Except for this problem it would be very easy to streamline the taxa by making the following synonyms: Phippsiella = Stegocephalopsis and Stegocephalus = Stegocephalooides. This would ignore the original premise of Schellenberg (1925b) in attributing importance to the acuteness of the posteroventral lobe on article 2 of pereopod 7 when Phippsiella and Stegocephalopsis were erected. Some other debatable attributes have since surfaced, such as the importance of hooked-non-hooked spines on the outer plate of maxilla 2 (implicating Stegocephalopsis katalia and Phippsiella minima both unhooked), or the absence of left lacinia mobilis (Phippsiella nipoma), or the giant sheath-based left lacinia mobilis (Stegocephalooides katalia), the series of stages between 4 and 3 palpular articles on the maxillipedal palp (vestigial on S. katalia and absent on Stegocephalooides wagini and Stegocephalopsis pacifica), the presence of article 2 on the outer ramus of uropod 3 (Stegocephalopsis camoti), the intermediate expansion of article 2 on pereopod 6 (Stegocephalopsis katalia), the degree of acuteness on the posteroventral lobe of article 2 on pereopod 7 (Stegocephalooides camoti being intermediate), the length of the accessory flagellum relative to the first flagellar article of the primary flagellum (too short in Stegocephalus hancocki for Stegocephalus) and varying problems about shortness and elongation of the peduncle of uropod 3 intragenerically (such as Stegocephalopsis pacifica too long for Stegocephalopsis and Stegocephalooides attingens too short for Stegocephalooides, and Stegocephalus viscaina too long for Stegocephalus). Many of these characters are unknown in several taxa so that our solution for the moment is shown in couplet 8 of Key 1 (et seq.) but obviously monographic work is required.

### Key 1 to Genera of Stegocephalidae

1. Outer plate of maxilla 2 absent .......................................................... **Bathystegocephalus**
   — Outer plate of maxilla 2 present .................................................. 2

2. Outer plate of maxilla 2 gaping, geniculate (attached to lateral process from base of inner plate) (Fig.123B) .................................................. 3
   — Outer plate of maxilla 2 appressed to inner plate .................................. 11

3. Telson entire .................................................................................. **Tetradeion**
   — Telson cleft .................................................................................. 4

4. Rami of uropod 3 obsolete or absent ............................................ **Stegophippiella**
   — Rami of uropod 3 well developed .......................................................... 5

5. Palp article 2 of maxilliped produced distomedially ......................... **Phippsia**
   — Palp article 2 of maxilliped unproduced ........................................ 6
<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
<th>Species</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.</td>
<td>Labrum elongate, more than twice as long as broad, symmetrically incised</td>
<td><em>(Stegocephalopsis, Phippsiella)</em> Stegocephalus</td>
</tr>
<tr>
<td></td>
<td>— Labrum ordinary, about as long as broad, asymmetrically incised</td>
<td></td>
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<tr>
<td>7.</td>
<td>Palp of maxilla 1 2-articulate</td>
<td><em>Phippsiella</em></td>
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<td></td>
<td>— Palp of maxilla 1 1-articulate</td>
<td></td>
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<tr>
<td>8.</td>
<td>Outer ramus of uropod 3 2-articulate</td>
<td><em>Stegocephaloides camoti</em></td>
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<tr>
<td></td>
<td>— Outer ramus of uropod 3 1-articulate</td>
<td></td>
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<tr>
<td>9.</td>
<td>Posteroventral lobe on article 2 of pereopod 7 rounded</td>
<td><em>(Stegocephalopsis (part) (and <em>S. katalia)</em>)</em></td>
</tr>
<tr>
<td></td>
<td>— Posteroventral lobe on article 2 of pereopod 7 sharp</td>
<td></td>
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<tr>
<td>10.</td>
<td>Article 2 of pereopod 6 expanded</td>
<td><em>Stegocephalus</em></td>
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<tr>
<td></td>
<td>— Article 2 of pereopod 6 rectilinear</td>
<td><em>Stegocephaloides</em></td>
</tr>
<tr>
<td>11.</td>
<td>Palp of maxilla 1 2-articulate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>— Palp of maxilla 1 1-articulate</td>
<td></td>
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<tr>
<td>12.</td>
<td>Pereopod 4 prehensile (subchelate)</td>
<td><em>Parandaniexis</em></td>
</tr>
<tr>
<td></td>
<td>— Pereopod 4 simple</td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>Mandibular incisor toothed</td>
<td><em>Alexandrella</em> of Stilipedidae (<em>Pseudandaniexis)</em></td>
</tr>
<tr>
<td></td>
<td>— Mandibular incisor smooth</td>
<td></td>
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<tr>
<td>14.</td>
<td>Telson entire, [outer ramus of uropod 3 usually 2-articulate]</td>
<td></td>
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<tr>
<td></td>
<td>— Telson cleft, [outer ramus of uropod 3 variable]</td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td>Article 1 of main flagellum on antenna 1 much longer than peduncle, article 5 of peduncle on antenna 2 much longer than article 4</td>
<td><em>Parandania</em></td>
</tr>
<tr>
<td></td>
<td>— Article 1 of main flagellum on antenna 1 subequal to peduncle, article 5 of peduncle on antenna 2 subequal to or shorter than article 4</td>
<td></td>
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<tr>
<td>16.</td>
<td>Dactyls of gnathopods with large teeth or pectinations, mandibular incisor toothed</td>
<td><em>Andaniella</em></td>
</tr>
<tr>
<td></td>
<td>— Dactyls of gnathopods with minute teeth or setules, mandibular incisor minutely crenulate</td>
<td><em>Andaniopsis</em></td>
</tr>
<tr>
<td>17.</td>
<td>Mandibular incisor toothed</td>
<td><em>Steleuthera</em></td>
</tr>
<tr>
<td></td>
<td>— Mandibular incisor minutely crenulate or smooth</td>
<td></td>
</tr>
<tr>
<td>18.</td>
<td>Article 5 of antenna 2 very elongate</td>
<td><em>Euandania</em></td>
</tr>
<tr>
<td></td>
<td>— Article 5 of antenna 2 subequal to article 4</td>
<td></td>
</tr>
</tbody>
</table>
19. Palp of maxilliped with 3 articles, articles 1-2 assumed to be coalesced .................................................. Stegosoladidas
   — Palp of maxilliped 4-articulate ...................... Andaniotes (catchall genus) and Glorandaniotes

Key 2 to Genera of Stegocephalidae

1. Mandibular incisor strongly toothed ................................................................. 2
   — Mandibular incisor smooth or weakly crenulate ............................................... 9

2. Telson entire ........................................................................................................ 3
   — Telson cleft ........................................................................................................ 4

3. Pereopod 7 with 3 articles, outer plate of maxilla 2 geniculate .......................... Tetradeion
   — Pereopod 7 with 7 articles, outer plate of maxilla 2 not geniculate ............... Andaniella

4. Rami of uropod 3 obsolescent ........................................................................... Stegophippsiella
   — Rami of uropod 3 well developed .................................................................. 5

5. Outer plate of maxilla 2 absent, inner ramus of uropod 3 shortened ..................... Bathystegocephalus
   — Outer plate of maxilla 2 present, rami of uropod 3 subequal ......................... 6

6. Outer plate of maxilla 2 not geniculate ............................................................. Steleuthera
   — Outer plate of maxilla 2 geniculate .................................................................. 7

7. Labrum extremely elongate .............................................................................. Stegocephalina
   — Labrum weakly elongate or not ...................................................................... 8

8. Pulp of maxilla 1 2-articulate ......................................................................... Phippsiella
   — Pulp of maxilla 1 1-articulate ........................................................................ 9

9. Telson entire ....................................................................................................... 10
   — Telson cleft ..................................................................................................... 13

10. Pulp of maxilla 1 2-articulate ........................................................................... 11
    — Pulp of maxilla 1 1-articulate ........................................................................ 12

11. Pereopod 4 prehensile (subchelate) ................................................................. Parandaniexis
    — Pereopod 4 simple ......................................................................................... Andaniexis

12. Article 5 of antenna 2 greatly elongate ............................................................. Parandania
    — Article 5 of antenna 2 subequal to article 4 ................................................... Andaniopsis
1. Outer plate of maxilla 2 geniculate, palp article 2 of maxilliped produced distomedially .................................................. \textit{Phippsia}

2. Outer plate of maxilla 2 not geniculate, palp article 2 of maxilliped simple ................................................................. 14

13. Article 5 of antenna 2 elongate ........................................................................................................................................ 14

14. Article 5 of antenna 2 subequal to article 4 .......................................................................................................................... 15

15. Palp of maxilliped 4-articulate ............................................................................................................................................ Glorandaniotes, Andaniotes

15. Palp of maxilliped 3-articulate ............................................................................................................................................ Stegosoladidas

\textbf{Andaniella} Sars

Figs 122B, 123H

\textit{Andaniella} Sars, 1895: 210.

\textbf{Type species.} \textit{Andaniella pectinata} Sars, 1883, monotypy.


\textbf{Relationship.} \textit{Andaniella} is the basic member of a group with normal maxilla 2 and unclifted telson combined. It however is unique for its large teeth on the dactyls of the gnathopods. Most genera of the group have a 2-articulate outer ramus on uropod 3. Differing from \textit{Stelaeuthera} in the unclifted telson.

See \textit{Andaniexis}, \textit{Andaniopsis}, \textit{Parandania} and \textit{Parandaniexis}.

\textbf{Species.} See Stephensen (1925a, 1935d, 1940b, 1944a); \textit{A. integripes} Bellan-Santini & Ledoyer, 1986 [799+B]; \textit{A. pectinata} (Sars, 1883, 1895) (Shoemaker, 1931b) (Gurjanova, 1951) [216 + B + I].

\textbf{Habitat and distribution.} Marine, Arctic and boreal North Atlantic, and Marion Island, among hydroids, bryozoans, ascidian (\textit{Molgula conchilega}), 6-700 m, 2 species.

\textbf{Andaniexis} Stebbing

Figs 122F, 123A

\textit{Andania} Boeck, 1871b: 128 [homonym, Lepidoptera] (\textit{Andania abyssi} Boeck, 1871b, selected by Boeck, 1876).

\textbf{Type species.} \textit{Andania abyssi} Boeck, 1871b, selected by Boeck, 1876.

\textbf{Diagnosis.} Body smooth or carinate. Article 1 of flagellum on antenna 1 almost as long as peduncle. Article 4 of peduncle on antenna 2 much shorter article 5. Labrum very broad, symmetrically incised. Mandibular incisor broad and smooth. Labium ordinary, with 1 bidigitate distal finger. Maxilla 1 ordinary, palp 2-articulate. Outer plate of maxilla 2 ordinary, spines without hooks. Inner plate of maxilliped not reaching base of palp article 2, palp 4-articulate, article 2 unproduced. Dactyls of gnathopods simple (with weak pectinations). Pereopods 3-4 simple. Article 2 of pereopod 6 unexpanded (or expanded moderately). Pereopod 7 with 7 articles. Uropod 3 biramous, outer ramus 2-articulate, peduncle as long as rami. Telson as broad as long, entire, pointed.

\textbf{Variables.} Pleonites 1-4 carinate (\textit{A. spinescens}); article 2 of pereopod 6 linear (type); weakly expanded (\textit{A. australis}, \textit{A. stylifer}, \textit{A. subabyssi}); moderately expanded (\textit{A. mimoneetos} \textit{A. oculata}, \textit{A. spongicola}).

\textbf{Relationship.} Differing from \textit{Andaniella} in the smooth incisor; from \textit{Andaniella} and \textit{Andaniopsis} together in the 2-articulate palp of maxilla 1.

\textbf{Species.} See Gurjanova (1951); Shoemaker (1930a); Stephensen (1925a, 1933b, 1954d); \textit{A. abyssi} (Boeck, 1871b) (Sars, 1895) [355 + B]; \textit{A. australis} K.H. Barnard, 1932 (J.L. Barnard, ?1962d, 1964a) (Ledoyer, 1986) [835BA]; \textit{A. mimoneetos} Ruffo, 1975b (Bellan-Santini, 1970) [23EB]; \textit{A. spinescens} (Alcock, 1894) [609A].
Habitat and distribution. Marine, cold water cosmopolitan, pelagic or often on benthic corals and sponges, 190-6400 m, 9 species.

**Andaniopsis** Sars

Figs 122G, 123L

*Andaniopsis* Sars, 1895: 208.

**Type species.** *Andania nordlandica* Boeck, 1871b, monotypy.

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Relationship. Differing from Andaniella in the poorly toothed incisor, the simple dactyls of the gnathopods, and the longer inner plate of the maxilliped.

Species. Andaniopsis nordlandica (Boeck, 1871b) (Sars, 1895) (Stephensen, 1935d) (Gurjanova, 1951) [238 + B]; species, J.L. Barnard, 1967a [309B].

Habitat and distribution. Marine, cold North

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Fig. 123. Stegocephalidae and Pardaliscidae. A, Andaniexis abyssi; B, Phippsia gibbosa; C, Stegocephalina ingolfi; D, Stegocephalus inflatus; E, Pseudandaniexis mixtus; F, Andaniotes simplex; G, Stegophippschiella pumilis; H, Andaniella pectinata; I, Parandaniexis mirabilis; J, Tetradetia crassum; K, Bathystegocephalus globosus; L, Andaniopsis nordlandica; M, Tosilhus arroyo; N, Steleuthera maremboca.
Atlantic, North Pacific (?), 49-1748 m, 2 species.

**Andaniotes Stebbing**

Figs 122K, 123F

**Andaniotes Stebbing, 1897: 30.**

**Metandania** Stephensen, 1925a: 136 (**Metandania islandica** Stephensen, 1925a, original designation).

**Type species.** *Anonyx corpulentus* Thomson, 1882, monotypy.


**Variables.** Urosomites free (type); or 2-3 coalesced (*A. wallaroo*); rami of uropod 3 in male minute (type); upper lip entire (*A. wallaroo*); palp of maxilla 1 reduced (*A. ingens*); article 2 of pereopod 6 rectilinear (*A. ingens*); weakly expanded (*A. linearis, A. wallaroo*).

**Relationship.** Differing from *Steleuthera* in the smooth incisor.

See *Euandania, Giorandaniotes* and *Stegosoladidas*.

**Removal.** *Andaniotes simplex* K.H. Barnard, 1930, to *Stegosoladidas*.

**Species.** See Chilton (1921d); Schellenberg (1931, 1955); *A. corpulentus* (Thomson, 1882) (= *A. abyssorum* Stebbing, 1888) (= *A. islandica* Stephensen, 1925a) (Stebbing, 1897) (Hurley, 1955) (Watling & Holman, 1981) [426 + B + I]; *A. ingens* Chevreux, 1906a (Thurston, 1974a) [870 + B]; *A. linearis* K.H. Barnard, 1932 (Nicholls, 1938) (Watling & Holman, 1981) [870 + B]; *A. wallaroo* J.L. Barnard, 1972a [782].

**Habitat and distribution.** Marine, cold water, cosmopolitan, often in ascidians and sponges, 0-2012 m, 4 species.

**Bathystegocephalus** Schellenberg

Fig.123K

**Bathystegocephalus** Schellenberg, 1926c: 221.

**Type species.** *Stegocephalus globosus* Walker, 1909c, monotypy.


**Relationship.** Characterised by the absence of the outer plate on maxilla 2; therefore difficult to relate either to normal or geniculate alternatives of maxilla 2. Otherwise closest to *Phippsiella* of the geniculate maxilla 2 group and *Steleuthera* of the group bearing normal maxilla 2.

**Species.** *Bathystegocephalus globosus* (Walker, 1909c) (Pirlot, 1933a) (Birstein & Vinogradov, 1964) [600B].

**Habitat and distribution.** Marine, Indian Ocean and Indonesia, bathypelagic, 100-457(?1371) m, 1 species.

**Euandania** Stebbing

*Euandania* Stebbing, 1899a: 206.

**Type species.** *Andania gigantea* Stebbing, 1883, original designation.


**Additional character.** Pleonite 6 shorter than peduncle of uropod 3 (versus *Andaniotes*).

**Relationship.** If restricted to the type species, this genus differs from *Andaniotes* (if it is also restricted to...
A. corpulentus and A. wallaroo) in the elongate first flagellar article of antenna 1 and the elongate article 5 of antenna 2; differing from Steleuthera in the smooth incisor.

See Parandania.


Habitat and distribution. Marine, cold water cosmopolitan, (?0) 835-3430 m, 2 species.

Glorandaniotes Ledoyer


Type species. Glorandaniotes fissaicaudata Ledoyer, 1986, original designation.


Variables. Outer ramus of uropod 3 with small article 2 (version of J.L. Barnard, 1961a).

Relationship. Differing from Euandania in the uncleft telson. Differing from Andaniella in the elongate article 5 of antenna 2 and the smooth incisor. See Parandaniexis.


Habitat and distribution. Marine, cold water cosmopolitan, mesopelagic or deeper, 300-2200 m (confirmed), usually 550-960m, 1 species.

Parandaniexis Schellenberg

Figs 122A, 1231


Type species. Parandaniexis mirabilis Schellenberg, 1929b, monotypy.


Additional character. Coxa 1 small.

Relationship. Differing from Andaniella, a close ancestral form, and from all other stegocephalids in the
prehensile pereopod 4 possibly used in polychaete predation; like Parandania it also differs from Andaniella in the elongate article 5 of antenna 2.

**Species.** Parandaniexis dewitti Watling & Holman, 1980 [834A]; P. inermis Ledoyer, 1986 [618A]; P. mirabilis Schellenberg, 1929b (J.L. Barnard, 1967a) (Andres, 1977) [423A].

**Habitat and distribution.** Marine, cosmopolitan, cold water, demersal, predacious on polychaetes, abyssal, 2740-5330 m, 3 species.

*Phippsia* Stebbing

_Figs 122D, 123B_


**Type species.** *Stegocephalus similis* Sars, 1895, monotypy.

**Diagnosis.** Body smooth. Article 1 of flagellum on antenna 1 longer than peduncle or 'elongate'. Article 4 of peduncle on antenna 2 scarcely longer than article 5. Labrum ordinary, symmetrically or symmetrically incised. Mandibular incisor toothed. Labium ordinary, each lobe with 1 bidigitate or simple distal finger. Maxilla 1 ordinary, palp 2-articulate. Outer plate of maxilla 2 gaping and geniculate, spines usually with hooks. Inner plate of maxilliped variable in reaching base of palp article 2, palp 4-articulate, article 2 unproduced. Dactyls of gnathopods simple. Pereopods 3-4 simple. Article 2 of pereopod 6 expanded. Pereopod 7 with 7 articles, article 2 lobe rounded below (versus *Stegocephalus*). Uropod 3 biramous, outer ramus 1-articulate, peduncle subequal to or shorter than rami. Telson longer than broad, cleft.

**Variables.** Palp of maxilliped unknown (*P. kergueleni*), others 4-articulate; article 2 of pereopod 6 moderately expanded (*P. longicornis*, *P. abyssicola*, *P. minima*, *P. pajearella*, *P. nipoma*, *P. viscaina*); broadly expanded (*P. similis*, almost *P. nipoma*); labrum elongate (*P. minima*); left lacinia mobilis absent (*P. nipoma*)

**Relationship.** Juveniles of *Stegocephalus inflatus* look like species of *Phippsia*, especially because palp of maxilla 1 is 2-articulate, with the articles later fusing in adulthood. *Phippsia* is the basic genus of the group with geniculate outer plate on maxilla 2. It is probably closest to Steleuthera of the group with normal maxilla 2 but is obviously not directly descendent.

See Bathystegocephalus, *Phippsia*, *Stegocephalina*, *Stegocephalopsis*, *Stegocephalus*, *Stegophippsiella* and *Tettradeion*.

**Species.** See Gurjanova (1951); Stephensen (1925a, 1933b, 1935d); *P. abyssicola* Oldevig, 1959 [202A]; *P. kergueleni* Schellenberg, 1926c [851]; *P. longicornis* Gurjanova, 1962 [290A]; *P. minima* Stephensen, 1925a (not Shoemaker, 1931b) (Steele, 1967a) [216B]; *P. nipoma* J.L. Barnard, 1961a, 1962d (Kamenskaya, 1981a) [422BA]; *P. pajearella* J.L. Barnard, 1967a [309B]; *P. pseudophippsiella* Bellan-Santini, 1984 [301B]; *P. rostrata* K.H. Barnard, 1932 [833B]; *P. similis* (Sars, 1895) (Gurjanova, 1951) [216B + I]; *P. viscaina* J.L. Barnard, 1967a [309B].

**Habitat and distribution.** Marine, cosmopolitan, cold water, often among *Lophohelia*, 18-3580 m, 10 species.

*Stegocephalina* Stephensen

_Figs 122H, 123C_

*Stegocephalina* Stephensen, 1925a: 134.
Type species. Stegocephalina ingolfi Stephensen, 1925a, monotypy.


Additional character. Accessory flagellum usually much shorter than article 1 of primary flagellum.

Variables. Peduncle of uropod 3 platelike (S. camoti); outer ramus of uropod 3 2-articulate (S. camoti); peduncle of uropod 3 short (S. attingens).

Relationship. Like Stegocephalus in the pointed posteroventral lobe on article 2 of pereopod 7 but article 2 of pereopod 6 rectolinear (not expanded), and the peduncle of uropod 3 elongate in most of the species.


Species. See Bonnier (1896); Gurjanova (1951); Stephensen (1925a, 1935d, 1940b); S. attingens K.H. Barnard, 1916 (J.L. Barnard, 1961a) [740B]; S. auratus (Sars, 1883, 1895) (Gurjanova, 1951) [240B]; ?S. australis K.H. Barnard, 1916 (Griffiths, 1974c, 1975) (Ledoyer, 1986) [701B]; ?S. camoti J.L. Barnard, 1967a [309B]; S. christianiensis (Boeck, 1871b) (Sars, 1895) (Chevreux, 1911d) (Chevreux & Fage, 1925) (J.L. Barnard, 1964a) (Karaman, 1974b) (Lincoln, 1979a) [355 + B]; S. wagini (Gurjanova, 1936b, 1951) [220B].

Habitat and distribution. Marine, Atlantic Arctic-boreal, probably to South Africa, doubtful to east Pacific, 40-1938 m, 6 species (3 doubtful).


Type species. Stegocephaloides christianiensis Boeck, 1871b, original designation.


Stegocephalopsis Schellenberg

Stegocephalopsis Schellenberg, 1925b: 200.

Type species. Cancer ampulla Phipps, 1774, monotypy.

Diagnosis. Body smooth. Article 1 of flagellum on antenna 2 longer (male) or shorter (female) than peduncle. Article 4 of peduncle on antenna 2 scarcely longer than article 5. Labrum ordinary to elongate, asymmetrically or symmetrically incised. Mandibular incisor toothed. Labium ordinary, each lobe with 1 bidigitate or simple distal finger. Maxilla 1 ordinary, palp 1-articulate. Outer plate of maxilla 2 gaping and geniculate, spines usually with hooks. Inner plate of maxilliped variable in reaching base of palp article 2, palp 3-4 articulate (articles 1-2 occasionally coalesced), article 2 unproduced. Dactyls of gnathopods simple. Pereopods 3-4 simple. Article 2 of pereopod 6 rectolinear. Pereopod 7 with 7 articles, article 2 lobe rounded below (versus Stegocephalus). Uropod 3 biramous, outer ramus 1-articulate, peduncle subequal to rami. Telson longer than broad, cleft.
Variables. Palp of maxilliped 3-articulate (S. pacifica), article 4 vestigial (S. katalia); left lacinia mobilis huge and basally sheathed (S. katalia); article 2 of pereopod 6 slightly expanded (S. katalia); peduncle of uropod 3 elongate (S. katalia, S. pacifica); spines on outer plate of maxilla 2 simple (S. katalia).

Relationship. Differing from Stegocephalus and Stegocephaloides in the rounded posteroventral lobe on article 2 of pereopod 7 and from Phippsiella in the 1-articulate palp on maxilla 1, the rectilinear article 2 of pereopod 6, the short peduncle of uropod 3 and possibly in the hip-shaped epimeron 3, a factor needing further inquiry.

Removal. Stegocephalopsis wagini Gurjanova, 1936b, to Stegocephaloides.

Species. See Gurjanova (1951); Shoemaker (1955a); Stephensen (1925a, 1933b, 1935d, 1944a); S. ampulla (Phipps, 1774) (Bruggen, 1909) (Gurjanova, 1951, 1962) [200 + B]; ?S. katalia (J.L. Barnard, 1962d) [416A]; S. latus (Haswell, 1879a, 1885b) [783]; S. pacifica (Bulycheva, 1952) (Gurjanova, 1962) [391]; ?S. vanhoffeni (Schellenberg, 1926a) (K.H. Barnard, 1930) [870B]; ?S. vegae Oldevig, 1959) [287].

Habitat and distribution. Marine, cold water Arctic-boreal, 4-2220 m, 2 species.

Stegophippsiella Bellan-Santini & Ledoyer
Figs 103L, 123G

Stegophippsiella Bellan-Santini & Ledoyer, 1974; 694.

Type species. Stegophippsiella pacis Bellan-Santini & Ledoyer, 1974, original designation.


Additional character. Uropod 3 peduncle with apical notches marking obsolescent rami.

Relationship. Like Phippsiella and others of its group but rami of uropod 3 obsolescent or absent.

Species. Stegophippsiella pacis Bellan-Santini & Ledoyer, 1974 [851].

Habitat and distribution. Marine, Kerguelen Islands, 1-50 m, 1 species.
Stegosoladidus Karman & Barnard


Type species. Andaniotes simplex K.H. Barnard, 1930, original designation.


Relationship. The basic member of a group with appressed (normal) plates of maxilla 2, cleft telson and toothed incisor. See Andaniella, Andaniotes, Bathystegocephalus, Euandania and Phippsiella.

Species. Steleuthera maremboca J.L. Barnard, 1964a [502A].

Habitat and distribution. Marine, off Peru, abyssal, 6324-6328 m, 1 species.

Tetradeion Stebbing

Figs 122C, 123J

Tetradeion Stebbing, 1899a: 207.

Type species. Cyproidea crassa Chilton, 1883, original designation.

Diagnosis. Body smooth. Article 1 of flagellum on antenna 1 shorter than peduncle. Article 4 of peduncle on antenna 2 shorter than article 5. Labrum elongate, asymmetrically incised. Mandibular incisor toothed. Labium ordinary, with gaping extended lobes, with multidigitate distal fingers. Maxilla 1 ordinary, palp 2-articulate. Outer plate of maxilla 2 gaping and geniculate, spines with hooks. Inner plate of maxilliped exceeding base of palp article 1, palp 4-articulate, article 2 produced. Dactyls of gnathopods simple. Pereopods 3-4 simple. Article 2 of pereopod 6 unexpanded. Pereopod 7 with 3 articles. Uropod 3 biramous, outer ramus 2-articulate (or with nail), peduncle longer than rami. Telson longer than broad, entire. Additional characters. Article 3 of antenna 2 very elongate, antenna 2 geniculate between articles 3 and 4; inner ramus of uropod 3 much shorter than outer; coxae 6-7 covered by 5 and 4; article 2 of antenna 1 crested and produced.

Relationship. Like Phippsiella and others of its group but telson elongate and uncleft and pereopod 7 reduced to 3 articles.

Species. Tetradeion crassum (Chilton, 1883, 1924b) (Hurley, 1955) (J.L. Barnard, 1972b) [775].

Habitat and distribution. Marine, New Zealand, often off Elizetina blainvilliei, 0-3 m, 1 species.
STENOTHOIDAE Boeck, 1871b

Diagnosis. Accessory flagellum 0 to 2-articulate; mandibular molar evanescent; outer plates of maxillipeds vestigial; coxa 1 very small and partially covered by following coxae; coxa 4 enlarged, shield-like, not posterodorsally excavate; article 2 of pereopod 3 rectolinear; uropod 3 uniramous; telson entire.

See Amphiloichidae, Anamixidae, Cressidae, Leucothoidae, Pagetinidae and Philantidae.

Description. Rostrum inconspicuous; body smooth or carinate, very compressed laterally, generally shiny; labrum incised; mandibular palp feebly, 0 to 3-articulate; labium usually with inner lobes amalgamated, outer lobes with blunt extremities; inner plate of maxilla 1 feebly, usually naked, palp variable; maxilla 2 small, stout, poorly setose, inner plate often unproduced; gnathopod 1 usually feebly, variable, gnathopod 2 usually enlarged, subchelate, occasionally feebly; most of pereopod 5 usually hidden by coxae; epimera plain, usually of poor taxonomic value; uropod 3 with one ramus, ramus usually 2-articulate; subgroup thaumatelsonins (diverse and variable) often with telson hugely enlarged and fleshy, urosomites often variously fused together, one or more body segments often with large projection or unusually elongate.

Relationship. The Cressidae are very close but have the telson fused with pleonite 6 and article 2 of pereopod 5 expanded.

The Amphiloichidae resemble stenothoids but uropod 3 is biramous and the outer lobes of the maxillipeds are well developed.

Taxonomy. The genera are artificially separated on the basis of the 1 to 2-articulate palp of maxilla 1, the 0 to 3-articulate condition of the mandibular palp, occasionally the presence or absence of accessory flagellum (which is often badly observed), and the breadth of article 2 on pereopods 6 to 7 (which is relatively workable but occasionally transformational species and genera have intermediate degrees of expansion which cause minor confusion). These are very poor characters because fusion or loss of articles is undoubtedly polyphyletic. Virtually no attention has been paid to gnathopods and other possible characters although we have isolated a few new genera herein where separation is fairly clear. Because many species are poorly described, the stenothoids await a monographer who can give them synoptic treatment.

Key to Genera of Stenothoidae

1. Article 2 of pereopod 7 rectolinear ................................................................. 2
   --- Article 2 of pereopod 7 expanded ......................................................... 21
2. Telson thickened and fleshy ........................................................................ 3
   --- Telson flat and laminar ....................................................................... 11
3. Gnathopod 2 chelate .................................................................................... 4
   --- Gnathopod 2 subchelate or simple ...................................................... 5
4. Gnathopod 1 chelate .................................................................................. Raumahara
   --- Gnathopod 1 subchelate or simple ....................................................... Prothaumatelson
5. Mandibular palp 3-articulate ..................................................................... 6
   --- Mandibular palp 0 to 1-articulate ......................................................... 7
6. Pleonite 3 with dorsal process, article 1 of antenna 1 nasiform ................. Antatelson
   --- Pleonite 3 and antenna 1 smooth ......................................................... Thaumatelson
7. Uropod 3 reduced, inner ramus of uropods 1-2 shortened ..................... Chucullba
   --- Uropods 1-3 ordinary ........................................................................... 8
8. Antenna 1 not nasiform, article 2 of pereopods 5-7 not linear ................................................................. Goratelson
   — Antenna 1 nasiform, article 2 of pereopods 5-7 rectilinear ......................................................... 9
9. Gnathopods 1-2 alike ................................................................................................................. Parathaumatelson
   — Gnathopods 1-2 dissimilar ........................................................................................................ 10
10. Telson hugely elevated dorsally, pleonites 5-6 fused, pleonite 4 weakly extended posterodorsally ................................................................. Ausatelson
    — Telson fleshy but flat, pleonites 4-6 free, pleonite 4 strongly extended posterodorsally .............................. Pseudothaumatelson
11. Article 2 of pereopods 5-7 weakly expanded, not fully rectilinear ......................................................... Goratelson
    — Article 2 of pereopods 5-7 fully rectilinear ........................................................................ 12
12. Pleonite 4 with dorsal process ..................................................................................................... 13
    — Pleonite 4 lacking dorsal process ................................................................................................ 17
13. Pleonites 5-6 coalesced ............................................................................................................ Parathaumatelson
    — Pleonites 5-6 free .................................................................................................................. 14
14. Gnathopods chelate .................................................................................................................. Raumahara
    — Gnathopods subchelate or simple .......................................................................................... 15
15. Telson fleshy ............................................................................................................................. Pseudothaumatelson
    — Telson flat and laminar ........................................................................................................ 16
16. Mandibular palp 1-articulate, inner plate of maxilla 1 2-articulate, inner plates of maxilliped fused together ................................................................. Zaikometopa
    — Mandibular palp 2-3 articulate, inner plate of maxilla 1 1-articulate, inner plates of maxillipeds separated .......................................................... Hardametopa
17. Palp of maxilla 1 2-articulate ..................................................................................................... Probolisca
    — Palp of maxilla 1 1-articulate ................................................................................................... 18
18. Mandibular palp absent ............................................................................................................. Parametopella
    — Mandibular palp present ........................................................................................................ 19
19. Mandibular palp 2 to 3-articulate ............................................................................................. Metopella
    — Mandibular palp 1-articulate ................................................................................................... 20
20. Inner plates of maxillipeds partly fused, gnathopod 1 subchelate, carpus slightly elongate, unlobed ................................................................. Metopelloides
    — Inner plates of maxillipeds fully separated, gnathopod 1 simple, carpus short, lobed ........................ Vonimetopa
21. Article 2 of pereopod 6 not expanded or expanded less than on pereopod 7 .................................................................................................................. 22
    — Article 2 of pereopod 6 expanded as widely as on pereopod 7 .................................................................................................................. 26
22. Article 2 of pereopods 5-7 evenly but weakly expanded ........................................... *Goratelson*
   — Article 2 of pereopods 5-7 diversely expanded ......................................................... 23

23. Pleonite 3 with dorsal process ............................................................................. *Mesoprobolooides*
   — Pleonite 3 smooth ................................................................................................. 24

24. Mandibular palp 0 to 1-articulate ........................................................................ *Stenothoides*
   — Mandibular palp 2 to 3-articulate ........................................................................... 25

25. Article 2 of pereopod 7 tapering, basally expanded ........................................... *Mesometopa*
   — Article 2 of pereopod 7 evenly expanded ............................................................. *Mesoprobolooides excavata, Metopella*

26. Palp of maxilla 1 1-articulate ............................................................................... 27
   — Palp of maxilla 1 2-articulate ............................................................................... 30

27. Mandibular palp absent ......................................................................................... 28
   — Mandibular palp present ....................................................................................... 29

28. Article 5 of gnathopod 1 not elongate, gnathopod 2 not enlarged ......................... *Parametopa*
   — Article 5 of gnathopod 1 elongate, gnathopod 2 enlarged ........................................ *Wallanmetopa*

29. Mandibular palp 2 to 3-articulate ........................................................................... *Metopa*
   — Mandibular palp 1-articulate ............................................................................... *Stenula*

30. Mandibular palp absent ......................................................................................... 31
   — Mandibular palp present ....................................................................................... 32

31. Antenna 2 as long as antenna 1, coxa 2 bevelled anteroventrally .......................... *Stenothoe*
   — Antenna 2 half as long as antenna 1, coxa 2 subquadrate and protrusive anteroventrally ...... *Knysmetopa*

32. Article 2 of pereopod 5 with small posteroventral lobe ........................................... *Torometopa*
   — Article 2 of pereopod 5 evenly linear ..................................................................... 33

33. Mandibular palp 1-articulate ............................................................................... *Prostenothoe*
   — Mandibular palp 2 to 3-articulate ........................................................................... 34

34. Accessory flagellum 2-articulate ........................................................................... *Metopoides*
   — Accessory flagellum 0 to 1-articulate .................................................................... 35

35. Carpus of gnathopod 1 relatively short and lobate, propodus elongate and expanded ........................................... *Aurometopa*
   — Carpus of gnathopod 1 relatively long, not lobate, propodus short and barely expanded ........................................... *Proboloides*
Antatelson J.L. Barnard
Diagnosis. Antenna 1 bearing nasiform process on article 1. Accessory flagellum absent. Palp of mandible 3-articulate; palp of maxilla 1 2-articulate. Inner plate of maxilla 2 ordinary. Inner plates of maxillipeds well separated. Gnathopods 1-2 subchelate, scarcely different from each other in size and shape, gnathopod 1, palm scarcely oblique and shorter than posterior margin of propodus; article 4 incipiently chelate; article 5 short, weakly lobed; article 6 expanded, rectangular.

Type species. Thaumatelson walkeri Chilton, 1912d, original designation.

Fig. 124. Stenothoidae. A, Stenothoe marina; B, Antatelson walkeri; C, Thaumatelson herdmani; D, Proboloides gregarius; E, Parathaumatelson nasutum; F, Chaucullba warea; G, Miptop a alderi; H, Prothaumatelson nasutum; I, Raumahara ronge; J, Raumahara carinatum.
Gnathopod 2, palm transverse, articles 4-5 short, 5 lobed. Pereopods 5-7 with rectilinear article 2. Pereonite 4 elongate and tumid. Pleonites 4-6 coalesced, pleonite 3 with erect dorsal process. Telson huge, vertically elevated and laterally compressed, fleshy, lateral surface area equal to lateral area of urosome.

**Variables.** Rostrum huge (*A. rostratum*); palm of gnathopod 2 subtransverse (*A. antennatum*), oblique (*A. rostratum*); pleonite 3 lacking dorsal process (*A. antennatum*).

**Relationship.** See *Ausatelson*.

**Species.** *Antatelson antennatum* Bellan-Santini & Ledoyer, 1974; *A. cultricauda* (K.H. Barnard, 1932); *A. rostratum* Bellan-Santini & Ledoyer, 1974; *A. walkeri* (Chilton, 1912d) (Schellenberg, 1931) (Thurston, 1974a.b).

**Habitat and distribution.** Marine, Antarctic, austral, 20-200 m, 4 species.


**Type species.** *Metopoides aurorae* Nicholls, 1938, original designation.

Diagnosis. Antenna 1 lacking nasiform process on article 1. Accessory flagellum [not discerned]. Palp of mandible 3-articulate; palp of maxilla 1 2-articulate. Inner plate of maxilla 2 ordinary. Inner plates of maxillipeds well separated. Gnathopods 1-2 subchelate, scarcely different from each other in shape, gnathopod 1 small, palm oblique and shorter than posterior margin of propodus; article 4 not incipiently chelate; article 5 short, lobed; article 6 expanded. Gnathopod 2 enlarged, palm strongly oblique, article 5 short, lobed. Pereopod 5 with rectilinear article 2, pereopod 7 with expanded lobate article 2; pereopod 6 with intermediate article 2. Pleonite 4 ordinary. Pleonites 4-6 free; pleonite 3 lacking dorsal process; pleonite 4 not weakly extended posterodorsally. Telson ordinary, flat.

Relationship. Differing from Metopoides and Proboloides in the relatively short and weakly lobate carpus of gnathopod 1 with an unexpanded elongate propodus. From Torometopa in the perfectly rectilinear article 2 of pereopod 5. *Aurometopa* has article 2 of pereopod 6 differing from pereopod 7 unlike the other genera mentioned.

Species. *Aurometopa aurorae* (Nicholls, 1938) (J.L. Barnard, 1972b) [850].

Habitat and distribution. Marine, Macquarie Island, 0 m, 1 species.

*Ausatelson* J.L. Barnard

Fig. 125B

*Ausatelson* J.L. Barnard, 1972a: 312.

Diagnosis. Antenna 1 bearing nasiform process on article 1. Accessory flagellum absent. Palp of mandible 1-articulate; palp of maxilla 1 2-articulate. Inner plate of maxilla 2 obsolescent. Inner plates of maxillipeds partially fused together. Gnathopod 1 small, almost simple, palm oblique and longer than posterior margin of propodus; article 4 not incipiently chelate; article 5 short, unlobed; article 6 barely expanded. Gnathopod 2 enlarged, palm weakly oblique: article 4 short, lobed. Pereopods 5-7 with rectilinear article 2. Pereonite 4 highly elongate and tumid. Pleonites 5-6 coalesced; pleonite 3 dorsally tumid but lacking erect dorsal process; pleonite 4 weakly extended posterodorsally. Telson huge, vertically elevated and laterally compressed, fleshy, lateral surface area much smaller than lateral area of urosome.

Variables. Dactyls of pereopods pectinate (C. warea).

Relationship. Differing from Paraithaumatelson in the short inner rami of uropods 1-2 and loss of 2 articles on uropod 3. This is the only stenothoid with reduced uropod 3.


Habitat and distribution. Marine, southern Australia, intertidal, 2 species.

Goratelson J.L. Barnard


Type species. Goratelson warroo J.L. Barnard, 1972a, original designation.

Diagnosis. Antenna 1 lacking nasiform process on article 1. Accessory flagellum vestigial. Palp of mandible absent; palp of maxilla 1 2-articulate. Inner plate of maxilla 2 unproduced. Inner plates of maxillipeds well separated. Gnathopods 1-2 subchelate, scarcely different from each other in size and shape, gnathopod 1 small, subchelate, palm fully oblique and occupying all of posterior margin of propodus; article 5 short, lobed; article 6 expanded; gnathopod 2 enlarged, similar to 1 but propodus and dactyl relatively more robust and shorter. Pereopods 5-7 with rectangular weakly expanded article 2. Pereonite 4 short. Pleonites 4-6 mostly coalesced; pleonite 3 dorsally tumid but lacking erect dorsal process; pleonite 4 not extended posteriorly. Telson flat but huge, slightly elevated laterally, fleshy, lateral surface area almost equal to lateral area of urosome.

Relationship. Unique among the aberrant thaumatelsonins in the lack of produced inner plate on maxilla 2, short peronite 4 and stout rectangular article 2 of pereopods 5-7. Probably independently evolved from non-thaumatelsonin ancestry; note non-elevated, flat telson, albeit fleshy and huge.

Species. Goratelson warroo J.L. Barnard, 1972a [788].

Habitat and distribution. Marine, Western Australia, Cape Naturaliste, 0 m, 1 species.
**Hardametopa n.gen.**

*Type species.* *Metopa nasuta* Boeck, 1871b, here selected.

**Etymology.** From type locality, Hardangerfjord, and classic genus *Metopa.*

**Diagnosis.** Antenna 1 bearing nasiform process on article 1. Accessory flagellum absent. Palp of mandible 2 to 3-articulate; palp of maxilla 1 1-articulate. Inner plate of maxilla 2 ordinary. Inner plates of maxillipeds well separated. Gnathopod 1 small, simple, article 4 incipiently chelate; article 5 elongate, unlobed; article 6 linear. Gnathopod 2 scarcely enlarged, palm strongly oblique, article 5 short, lobed. Pereopods 5-7 with rectilinear article 2. Pereonite 4 elongate and tumid. Pleonites 4-6 free; pleonite 3 lacking dorsal process; pleonite 4 not extended posterodorsally. Telson ordinary, flat.

**Variables.** Cox a 4 adze-shaped and pointing posteriorly as in *Stenotheoe.*

**Relationship.** Differing from *Stenotheoe* in the short antenna 2 and non-bevelled anteroventral angle of coxa 2. From *Wallametopa* in the subchelate gnathopod 1. From *Parametopa* in the absence of a nasiform process on antenna 1, huge enlargement of gnathopod 2 and rearward pointing adze-shaped coxa 4.

**Species.** *Knysmetopa grandimana* (Griffiths, 1974c) [743].

**Habitat and distribution.** Marine, South Africa, 200 m, 1 species.

**Mesometopa** Gurjanova

*Mesometopa* Gurjanova, 1938b: 280.

*Type species.* *Metopa esmarki* Boeck, 1871b, original designation.

**Diagnosis.** Antenna 1 lacking nasiform process on article 1. Accessory flagellum absent. Palp of mandible 2 to 3-articulate; palp of maxilla 1 1-articulate. Inner plate of maxilla 2 ordinary. Inner plates of maxillipeds well separated. Cox a 2 not bevelled anteriorly. Gnathopods 1-2 subchelate, strongly different from each other in size and shape, gnathopod 1 small, subchelate, palm oblique and as long as posterior margin of propodus; article 4 chelate and freely projecting, article 5 elongate, unlobed; article 6 slightly expanded, Gnathopod 2 greatly enlarged, palm strongly oblique, articles 4-5 short, lobed. Pereopod 5 with rectilinear article 2, pereopods 6-7 with expanded and lobate article 2. Pereonite 4 ordinary. Pleonites 4-6 free; pleonite 3 lacking dorsal process; pleonite 4 not weakly extended posterodorsally. Telson ordinary, flat.

**Variables.** Gnathopod 1 weakly subchelate (e.g. *M. sinuata*).

**Relationship.** Differing from *Stenotheoides* in the presence of 2+ articulate mandibular palp. From *Mesoproholoides* in the 1-articulate palp on maxilla 1. From *Parametopella* in the slight basal expansion on article 2 of pereopod 7.

**Species.** *Mesometopa esmarki* (Boeck, 1871b) (Stebbing, 1906) [371]; *M. extensa* Gurjanova, 1948, 1951 [391B]; *M. gibbosa* Shoemaker, 1955a [267]; *M. neglecta* (Hansen, 1888) (Sars, 1895) (Shoemaker, 1955a) (Just, 1980), *M. n. roya* J.L. Barnard, 1966a [200 + B]; *M. sinuata* Shoemaker, 1964 [368].

**Habitat and distribution.** Marine, arctic-boreal, south to California, Japan and south-western Norway, 6-351 m, 5 species.
Mesoproboloides Gurjanova


Type species. Metopella cornuta Schellenberg, 1926a, original designation.

Diagnosis. Antenna 1 bearing or lacking nasiform process on article 1. Accessory flagellum absent. Palp of mandible 3-articulate; palp of maxilla 1 2-articulate. Inner plate of maxilla 2 [barely produced]. Inner plates of maxillipeds well separated. Gnathopods 1-2 subchelate, scarcely different from each other except in size. Gnathopod 1 small, palm oblique and shorter than posterior margin of propodus; article 4 incipiently chelate; article 5 short, lobed; article 6 elongate. Gnathopod 2 slightly enlarged, palm oblique, article 5 short, lobed, article 6 slightly expanding apicad, elongate. Pereopod 5 with rectilinear article 2, pereopods 6-7 with weakly (6) and well (7) expanded article 2; pereopod 7 with scarcely distinct posteroventral lobe on article 2. Pereonite 4 ordinary. Pleonites 4-6 free; pleonite 3 with article 5 short, lobed; article 6 elongate. Pereopod 4 enlarged, palm oblique; articles 4-5 short, 5 lobed. Pereopod 5 with rectolinear article 2, pereopods 6-7 with expanded, lobate article 2. Pereonite 4 short. Pleonites 4-6 free; pleonite 3 lacking dorsal process; pleonite 4 not extended posterodorsally. Telson ordinary, flat.

Variables. Article 1 of antenna 1 ventrodistally lobate (e.g. M. cruxlorraina), article 2 lobate (M. cornuta); coxa 4 excavate (e.g. M. excavata); gnathopod 1 barely subchelate (M. excavata); basis of pereopod 6 rectilinear (M. spinosa); basis of pereopod 7 tapering distally (M. similis), broad and lobate (M. spinosa); pleonite 3 lacking dorsal process but article 2 of pereopods 5-7 too aberrant to be in Metopella (M. excavata).

Relationship. Differing from Stenothoides and Mesometopa in the 2-articulate (versus 1-articulate) palp of maxilla 1.

Species. Mesoproboloides cornuta (Schellenberg, 1926a) [881]; M. cruxlorraina Moore, 1981b [783]; M. excavata Fenwick, 1977 [774] (see note above); M. similis (Schellenberg, 1926a) [881]; M. spinosa Bellan-Santini & Ledoyer, 1974 [851].

Habitat and distribution. Marine, Antarctic, austral, north to Tasmania and New Zealand, 3-50 m, 5 species.

Metopa Boeck

Figs 124G, 126B,CJ

Metopina Norman, 1900b: 45 [homonym, Diptera] (Metopa palmata Sars, 1895, original designation).
Sthenometopa Norman, 1902: 480 (new name for Metopina).

Prometopa Schellenberg, 1926a: 310 (Prometopa tuberculata Schellenberg, 1926a, monotypy) [see separately].

Type species. Leucothoe clypeata Kroyer, 1842, selected by Boeck, 1876.

Diagnosis. Antenna 1 lacking nasiform process on article 1. Accessory flagellum absent or vestigial. Palp of mandible 2 to 3-articulate; palp of maxilla 1-articulate. Inner plate of maxilla 2 ordinary. Inner plates of maxillipeds mostly fused together or well separated (type). Gnathopods 1-2 subchelate, different from each other in size and shape: gnathopod 1 small, almost simple (variable), article 4 incipiently chelate; article 5 elongate, barely lobed; article 6 scarcely expanded, almost linear. Gnathopod 2 enlarged, palm oblique; articles 4-5 short, 5 lobed. Pereopod 5 with rectolinear article 2, pereopods 6-7 with expanded, lobate article 2. Pereonite 4 short. Pleonites 4-6 free; pleonite 3 lacking dorsal process; pleonite 4 not extended posterodorsally. Telson ordinary, flat.

Variables. Body carinate or toothed (e.g. M. cristata); article 4 of gnathopod 1 very elongate, palm well developed, almost transverse (e.g. M. leptocarpa), dactyl stubby and setose (M. palmata), article 5 short, almost lobate (e.g. M. stelleri); gnathopod 2 hugely and doubly parachelate (M. norvegica), weakly parachelate (M. palmata); article 2 of pereopod 4 of intermediate expansion (e.g. M. clypeata).

Relationship. Differing from Prometopa and Metopoides in the lack of accessory flagellum; from Proboloides and Metopoides in the 1-articulate palp of maxilla 1; and from Stenothoe in the presence of a mandibular palp and 1-articulate palp of maxilla 1.

Species. See Chevreux & Fage (1925), Gurjanova (1951), Schellenberg (1942), Stephensen (1930a, 1955a); M. abyssalis Stephensen, 1931a [209B]; M. abyssi Piriot, 1933a [601B]; M. aequicornis Sars, 1879, 1885 (Stephensen, 1938b) (Gurjanova, 1951) [202B]; M. affinis Boeck, 1871b (Sars, 1895) (Stephensen, 1938b) (Gurjanova, 1951) [238]; M. alderi (Bate, 1857d) (Sars, 1895) (Stephensen, 1938b) (Lincoln, 1979a) (M. spectabilis Sars, 1879, 1895) [200 + I]; M. angustimana Gurjanova, 1948, 1951 [391B]; M. beringiensis Oldeng. 1959 [274]; M. boeckii Sars, 1895 (Gurjanova, 1951) (= M. norvegica Bate & Westwood, 1868, homonym) [220]; M. borealis Sars, 1883, 1895 (Lincoln, 1979a) [240]; M. brazelli (Goes, 1866) (Sars, 1895) (Lincoln, 1979a) (Just, 1980) [200]; M. bulychevae Gurjanova, 1955b [322B]; M. cistella J.L. Barnard, 1969a [372]; M. clypeata (Kroyer, 1842, 1845, 1846a) (Gurjanova, 1951) (Shoemaker, 1955a) [200 + B]; M. collei Gurjanova, 1948, 1951 [279]; M. cristata Gurjanova, 1955b (Shoemaker, 1964) [280B]; M. dawsoni J.L. Barnard, 1962c, 1964b [370]; M. derjugini Gurjanova, 1948, 1951 [278]; M. gigas Stuxberg, 1880 (Della Valle, 1893), nomen

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nudum [1291]; M. glacialis (Kroyer, 1842, 1845, 1846a) (Just, 1980) (Vader & Beehler, 1983) (= M. cariana Gurjanova, 1929b, 1951) [220 + I]; M. groenlandica Hansen, 1888 (Stephensen, 1936) (Stephensen & Thorson, 1936) (= M. hirsutimana Blake, 1929) [250 + B]; M. hearini Dunbar, 1954 [258]; M. invalida Sars, 1895 (Gurjanova, 1951) (Dunbar, 1954) [238 + 258]; M. japonica Gurjanova, 1952b [285]; M. kobjakovae Gurjanova, 1955b [286]; M. koreana Gurjanova, 1952b [291]; M. latimana Hansen, 1888 (Lincoln, 1979a) (= M. abscisca Norman, 1900b) [216]; M. layi Gurjanova, 1948, 1951 [279]; M. leptocarpa Sars, 1883, 1895 (Gurjanova, 1951) [216 + B]; M. longicornis Boeck, 1871b (Sars, 1895) (Just, 1980) [220]; M. longirama Dunbar, 1942, 1954 [258]; M. majuscula Gurjanova, 1948, 1951 [280]; M. mirifica Gurjanova, 1952b [231A]; M. normani Hoek, 1889 (Tesch, 1916a) (Stephensen, 1929) [237]; M. norvegica (Linjeborg, 1851) (= M. pollexiana Bate, 1857d, Sars, 1895) [216 + B]; M. palmitata Sars, 1895 (Gurjanova, 1951) [216]; M. propinqua Sars, 1895 (Lincoln, 1979a) [220]; M. pusilla Sars, 1895 (Lincoln, 1979a) (Just, 1980) [216]; M. quadrangula Reisbich, 1905 (Stephensen, 1926, 1929b) [236]; M. robusta Sars, 1895 (Stephensen, 1938b) (Shoemaker, 1955a) [216 + B A]; M. samiliana J.L. Barnard, 1966a, 1967a [370B]; M. simaata Sars, 1895 (Gurjanova, 1951) [216 + B]; M. volsbergi Schneider, 1884 (Sars, 1895) (Lincoln, 1979a) (Vader, 1983b) [216]; M. spinicauda Shoemaker, 1955a [267]; M. spitzbergensis Bruggen, 1907a (Stephensen, 1933b) (Gurjanova, 1951) [220]; M. stelleri Shoemaker, 1964 [231B]; M. submajuscula Gurjanova, 1948, 1951 [290]; M. tenuimaana Sars, 1895 (Lincoln, 1979a) (Just, 1980) [220]; M. timonovii Gurjanova, 1955b [286]; M. tuberculata (Schellenberg, 1926a) see Prometopella; M. uschakovi Gurjanova, 1948, 1951 [279]; M. wiesel Gurjanova, 1933b, 1951 (Busheeva, 1977) [220].

Habitat and distribution. Marine, mostly cold water Arctic-boreal, descending to bathyal in more southerly latitudes, 0-2300 m, 50 species.

Metopella Sars, revised

Fig.126A


Type species. Metopella longimana Boeck, 1871b, selected by Gurjanova, 1938b.

Diagnosis. Antenna 1 lacking nasiform process on article 1. Accessory flagellum absent. Palp of mandible 1-articulate; palp of maxilla 1 1-articulate. Inner plate of maxilla 2 ordinary. Inner plates of maxillipeds well separated. Gnathopods 1-2 different from each other in size and shape, gnathopod 1 small, simple, article 4 incipiently chelate; article 5 elongate, unlobed; article 6 linear. Gnathopod 2 slightly enlarged, palm weakly oblique, articles 4-5 short, 5 lobed. Pereopods 5-7 with rectilinear article 2 but article 2 on pereopod 7 broader than on pereopods 5-6 (variable). Pereonite 4 ordinary. Pereonites 4-6 free; pereonite 3 lacking dorsal process; pereonite 4 not extended posterodorsally. Telson ordinary, flat.

Variables. Inner plates of maxillipeds mostly fused together (e.g. M. angusta); article 2 of pereopods 5-7 all rectilinear (M. angusta).

Relationship. Differing from Metopelloides in the presence of a 2 to 3-articulate (versus 1-articulate) mandibular palp; from Probolisca and Parametopella in the 1-articulate palp of maxilla 1; from Mesometopella in the unexpanded base of article 2 on pereopod 7.

A polyglot genus needing more division; see Hardametopa.

Removals. See Hardametopa.

Species. See Chevreux & Fage (1925), Gurjanova (1951), Schellenberg (1942), Stephensen (1931a, 1938b, 1940b, 1944a), Shoemaker (1930a, 1955a); M. angusta Shoemaker, 1949b (Bousfield, 1973) [254]; M. aporpis J.L. Barnard, 1962c, 1964b, 1966b [370]; M. buynitzkii Gurjanova, 1946, 1951 [291]; M. longimana (Boeck, 1871b) (Sars, 1895) (Just, 1980) [220]; M. macrochira Gurjanova, 1948, 1951 [391].

Habitat and distribution. Marine, Arctic-boreal, south to western Mexico, 0-226 m, 7 species.

Metopelloides Gurjanova, revised

Metopelloides Gurjanova, 1938b: 281.

Type species. Metopella micropalpa Shoemaker, 1930a, original designation.

Diagnosis. Antenna 1 lacking nasiform process on article 1. Accessory flagellum present. Palp of mandible 1-articulate; palp of maxilla 1 1-articulate. Inner plate of maxilla 2 ordinary. Inner plates of maxillipeds partially fused together. Gnathopods 1-2 subchelate, different from each other in size and shape, gnathopod 1 small, subchelate, palm oblique and as long as posterior margin of propodus; article 4 incipiently chelate; article 5 slightly elongate, not lobed; article 6 short, weakly expanded. Gnathopod 2 enlarged, palm strongly oblique, article 4 short, lobed. Pereopods 5-7 with rectilinear article 2 but pereopod 7 with slightly widened article 2; pereopods 6-7 with barely distinct posteroventral lobe on article 2. Pereonite 4 ordinary. Pereonites 4-6 free; pereonite 3 lacking dorsal process; pereonite 4 not extended posterodorsally. Telson ordinary, flat.

Relationship. Differing from Metopella in the reduction of the mandibular palp to 1 article; from
**Probolisca** in the 1-articulate palp of maxilla 1; from *Stenothoides* in the narrower article 2 of pereopod 7.

See *Voniumetopa* and *Zaiometopella*.

**Removals.** See *Voniumetopa* and *Zaiometopella*.

**Species.** See same references as *Metopa*; *M. micropalpa* (Shoemaker, 1930a) (Gurjanova, 1951) [256 + 1]; *M. stephensi* Gurjanova, 1938b, 1951 (Shoemaker, 1955a) [280 to 267]; *M. tattersalli* Gurjanova, 1938b, 1951 (Shoemaker, 1955a) [280 to 267].

**Habitat and distribution.** Marine, Arctic-boreal, 1-104 m, 3 species.

*Metopoides* Della Valle, revised


**Type species.** *M. magellanica* Stebbing, 1888, selected by Gurjanova, 1938b.

**Diagnosis.** Antenna 1 lacking nasiform process on article 1. Accessory flagellum 2-articulate. Palp of mandible 2 to 3-articulate; palp of maxilla 1 2-articulate. Inner plate of maxilla 2 ordinary. Inner plates of maxillipeds well separated. Gnathopods 1-2 subchelate, different from each other in size and shape, gnathopod 1 small, subchelate, palm oblique and not shorter than posterior margin of propodus; article 4 incipiently chelate; article 5 slightly elongate, unlobed; article 6 short, expanded. Gnathopod 2 enlarged, palm strongly oblique, articles 4-5 short, lobed. Pereopod 5 with rectilinear article 2, pereopods 6-7 with expanded and lobate article 2. Pleonite 4 ordinary. Pleonites 4-6 free; pleonite 3 lacking dorsal process; pleonite 4 not extended posterodorsally. Telson ordinary, flat.

**Relationship.** Differing from *Proboloides* in the presence of a 2-articulate accessory flagellum.

**Removals.** Following species to *Aurometopa*; *M. aurora* Nicholls, 1938; following species to *Torometopa*; *M. aequalis* J.L. Barnard, 1962d; *M. compacta* Stebbing, 1888; *M. crassicornis* Schellenberg, 1931; *M. parallelocheir* (Stebbing, 1888).

**Species.** *Metopoides clavata* Schellenberg, 1931 [833 + s]; *M. crassa* Schellenberg, 1931 [831]; *M. curvipes* Schellenberg, 1926a [881]; *M. ellipsoidea* Schellenberg, 1931 [833]; *M. heterostylis* Schellenberg, 1926a (Nichols, 1938) (Bellan-Santini, 1972b) [870c]; *M. longicornis* Schellenberg, 1931 [831]; *M. macrocheir* Schellenberg, 1926a [881]; *M. magellanica* Stebbing, 1888 (Schellenberg, 1931) [867]; *M. sarsi* (Pfeffer, 1888) (Schellenberg, 1931) (Bellan-Santini & Ledoyer, 1974) (=*M. walkerii* Chevreux, 1906c) [880].

**Habitat and distribution.** Marine, Antarctic-austral, 0-385 m, 9 species.

*Parametopa* Chevreux, revised


**Type species.** *Parametopa kervillei* Chevreux, 1901b, original designation.

**Diagnosis.** Antenna 1 bearing nasiform process on articles 1-2. Accessory flagellum absent. Palp of mandible absent; palp of maxilla 1 1-articulate. Inner plate of maxilla 2 ordinary. Inner plates of maxillipeds well separated. Gnathopods 1-2 subchelate, scarcely different from each other in size and shape, gnathopod 1 small, weakly subchelate, palm oblique and shorter than posterior margin of propodus; article 4 incipiently chelate; article 5 short, lobed; article 6 almost linear. Gnathopod 2 slightly enlarged, palm almost transverse, articles 4-5 short, lobed. Pereopod 5 with rectilinear article 2, pereopods 6-7 with expanded and lobate article 2. Pleonite 4 ordinary. Pleonites 4-6 free; pleonite 3 lacking dorsal process; pleonite 4 not extended posterodorsally. Telson ordinary, flat.

**Variables.** Antenna 1 lacking nasiform lobe, article 5 of gnathopod 1 as long as article 6, not lobed, and male gnathopod 2 very enlarged (*P. alaskensis*); article 4 of gnathopod 2 not chelate (*P. crassicornis*).

**Relationship.** Differing from *Metopa*, *Prometopa* and *Stenula* by the absence of the mandibular palp. From *Stenothea* in the 1-articulate palp of maxilla 1.

See *Wallametopa*.

**Species.** *Parametopella alaskensis* (Holmes, 1904) (Gurjanova, 1951) [277]; *P. crassicornis* Just, 1980 [253]; *P. kervillei* Chevreux, 1901b (Chevreux & Fage, 1925) (Lincoln, 1979a) (=*P. sarsi* Norman, 1907) [239 + 242].

**Habitat and distribution.** Marine, Arctic-boreal south to Guernsey, 0-66 m, 3 species.

*Parametopella* Gurjanova


**Type species.** *Stenothea cypris* Holmes, 1905, original designation.

**Diagnosis.** Antenna 1 lacking nasiform process on
article 1 (variable). Accessory flagellum absent. Palp of mandible absent; palp of maxilla 1 1-articulate. Inner plate of maxilla 2 ordinary. Inner plates of maxillipeds partially fused together. Gnathopods 1-2 different from each other in size and shape, gnathopod 1 small, simple, article 4 incipiently chelate; article 5 short, lobed; article 6 expanded. Gnathopod 2 enlarged, palm strongly oblique, article 5 short, lobed. Pereopods 5-7 with rectolinear article 2. Pereonite 4 ordinary. Pleonites 4-6 free; pleonite 3 lacking dorsal process; pleonite 4 not extended posterodorsally. Telson ordinary, flat.

**Variables.** Article 1 of antenna 1 with nasiform lobe (*P. stelleri*); accessory flagellum present (*P. inquilina*); urosomites 2-3 fused together (*P. texensis*).

**Relationship.** Differing from *Metopella* and *Metopelloides* in the lack of a mandibular palp; from *Probolisca* in the 1-articulate palp of maxilla 1.

**Species.** *Parametopella cypris* (Holmes, 1905) (Bousfield, 1973) [361]; *P. inquilina* Watling, 1976 [363]; *P. nisus* J.L. Barnard, 1962c [373]; *P. stelleri* Gurjanova, 1948, 1951 [279]; *P. texensis* McKinney et al., 1978 [474].

**Habitat and distribution.** Marine, Pan-American warm temperate, Cape Cod to Gulf of Mexico and southern California to Bering Sea, 8-79 m, 5 species.

*Parathaumatelson* Gurjanova

**Figs** 124E, 125D


**Type species.** *Metopa nasica* Stephensen, 1927a, original designation.

**Diagnosis.** Antenna 1 bearing nasiform process on article 1. Accessory flagellum absent. Palp of mandible absent; palp of maxilla 1 2-articulate. Inner plate of maxilla 2 barely produced. Inner plates of maxillipeds well separated. Gnathopods 1-2 subchelate, scarcely different from each other in size and shape, palm scarcely oblique and shorter than posterior margin of propodus; article 4 incipiently chelate only on gnathopod 1, article 5 short, lobed; article 6 expanded, elongate. Pereopods 5-7 with rectolinear article 2. Pereonite 4 elongate. Pleonites 5-6 coalesced; pleonite 3 lacking dorsal process; pleonite 4 weakly extended posterodorsally. Telson fleshy but small.

**Relationship.** Differing from *Pseudothaumatelson* in the lack of mandibular palp and accessory flagellum and in the similarity of gnathopods 1 and 2. From *Raumahara* in the non-chelate gnathopods and presence of nasiform lump on antenna 1.

**Species.** *Parathaumatelson nasicum* (Stephensen, 1927a) (J.L. Barnard, 1972b) [850].

**Habitat and distribution.** Marine, Auckland Islands and south New Zealand, intertidal, 1 species.

*Probolisca* Gurjanova

*Probolisca* Gurjanova, 1938b: 279.

**Type species.** *Metopa ovata* Stebbing, 1888, original designation.

**Diagnosis.** Antenna 1 lacking nasiform process on article 1 (variable). Accessory flagellum 1-articulate. Palp of mandible 2-articulate; palp of maxilla 1 2-articulate. Inner plate of maxilla 2 ordinary. Inner plates of maxillipeds well separated. Gnathopods 1-2 subchelate, scarcely different from each other in size and shape; gnathopod 1 small, subchelate, palm scarcely oblique and shorter than posterior margin of propodus; article 4 incipiently chelate; article 5 short, lobed; article 6 weakly expanded. Gnathopod 2 slightly enlarged, palm almost transverse; article 5 short, lobed. Pereopods 5-7 with rectolinear article 2. Pereonite 4 ordinary. Pleonites 4-6 free; pleonite 3 lacking dorsal process; pleonite 4 not extended posterodorsally. Telson ordinary, flat.

**Variables.** Article 1 of antenna 1 with nasiform lobe (*P. nasutigenes*); mandibular palp 3-articulate (*P. elliptica, P. nasutigenes*); gnathopod 1 weaker than in type, carpus not lobate, propodus less robust (*P. elliptica, P. nasutigenes*).

**Relationship.** Differing from *Metopella, Metopelloides* and *Parametopella* in the 2-articulate palp of maxilla 1. Species other than the type may require generic separation.

**Species.** *Probolisca elliptica* (Schellenberg, 1931) [867]; *P. nasutigenes* (Stebbing, 1888) (Bellan-Santini & Ledoyer, 1974) [851]; *P. ovata* (Stebbing, 1888) (J.L. Barnard, 1972b) (Thurston, 1974b) (Bellan-Santini & Ledoyer, 1974) (Griffiths, 1976) [880].

**Habitat and distribution.** Marine, Antarctic, austral, 0-235 m, 3 species.

*Proboloides* Della Valle

**Type species.** *Proboloides nasutus* Lilljeborg, 1867 (proboloides, locality unknown). A new species.

**Diagnosis.** Antenna 1 with nasiform process on article 1 (variable). Accessory flagellum present (P. stelleri); accessory flagellum absent. Palp of mandible absent; palp of maxilla 1 1-articulate. Inner plate of maxilla 2 ordinary. Inner plates of maxillipeds partially fused together. Gnathopods 1-2 different from each other in size and shape, gnathopod 1 small, simple, article 4 incipiently chelate; article 5 short, lobed; article 6 expanded. Gnathopod 2 enlarged, palm strongly oblique, article 5 short, lobed. Pereopods 5-7 with rectolinear article 2. Pereonite 4 elongate. Pleonites 5-6 coalesced; pleonite 3 lacking dorsal process; pleonite 4 weakly extended posterodorsally. Telson fleshy but small.

**Relationship.** Differing from *Pseudothaumatelson* in the lack of mandibular palp and accessory flagellum and in the similarity of gnathopods 1 and 2. From *Raumahara* in the non-chelate gnathopods and presence of nasiform lump on antenna 1.

Type species. *Metopa gregaria* Sars, 1882, selected by Gurjanova, 1938b.

**Diagnosis.** Antenna 1 lacking nasiform process on article 1. Accessory flagellum 0 to 1-articulate. Palp of mandible 2 to 3-articulate; palp of maxilla 1 2-articulate. Inner plate of maxilla 2 ordinary. Inner plates of maxillipeds well separated. Gnathopod 1 small, almost simple, barely subchelate, palm oblique and shorter than posterior margin of propodus; article 4 chelate; article 5 elongate, unlobed; article 6 short, barely expanded. Gnathopod 2 enlarged, palm strongly oblique, article 4 elongate, lobed, article 5 short, lobed. Pereopod 5 with non-lobate rectolinear article 2, pereopods 6-7 with expanded and lobate article 2. Pereonite 4 ordinary. Pleonites 4-6 free; pleonite 3 lacking dorsal process; pleonite 4 not extended posterodorsally. Telson ordinary, flat.

**Variables.** Eyes absent (*P. tunda*); mandibular palp 2-articulate (*Proboliella typica*); gnathopod 1 simple (*P. holmest*), propodus expanded and palm well developed (*P. grandimana*), carpus very stout (*P. clypeata*); article 4 of gnathopod 2 not elongate (*P. calcaratum*); gnathopod 1 simple, barely subchelate, palm oblique and shorter than posterior margin of propodus; article 4 chelate; article 5 elongate, linear. Gnathopod 2 enlarged, palm strongly oblique, article 4 short, unlobed. Pereopod 5 with rectolinear article 2, pereopods 6-7 with expanded and lobate article 2. Pereonite 4 slightly elongate and tumid. Pleonites 4-6 free; pleonites 2-3 with erect dorsal process; pleonite 4 weakly extended posterodorsally. Telson ordinary, flat.

**Relationship.** Differing from *Stenothoe* in the presence of a mandibular palp; from *Metopa* in the 2-articulate palp of maxilla 1 and the separate inner lobes of the maxilliped.

See *Aurometopa*, *Metopoides*, *Prostenothoe* and *Torometopa*.

**Removals.** Following species to *Torometopa*: *P. antarcticus* Walker, 1906c, 1907; *P. carinata* Schellenberg, 1931; *P. crenatipalmatus* Stebbing, 1888; *P. dentimanus* Nicholls, 1938; *P. palmatus* Ruffo, 1949; *P. perlatus* K.H. Barnard, 1930; *P. porcellanus* K.H. Barnard, 1932; *P. stephenseni* Ruffo, 1949.

**Species.** See Stephens (1938b), Gurjanova (1951); *P. anophthalma* Ledoyer, 1986a [618B]; *P. armata* Ledoyer, 1986 [618A]; *P. calcarata* Sars, (1883, 1895) (Gurjanova, 1951) (Vader, 1969a) [238 + B]; *P. clypeata* (Stimpson, 1853) (Stephensen, 1931a) [260 + 253 + 251]; *P. grandimana* (Bonnier, 1896) (Stebbing, 1906) [303B]; *P. gregaria* (Sars, 1883, 1895) (Chevreux & Fage, 1925) [216 + B]; *P. holmesi* Bousfield, 1973 [254]; *P. pacifica* (Holmes, 1908) (Shoemaker, 1964) [310B]; *P. rotunda* (Stebbing, 1917b) (K.H. Barnard, 1940) (Griffiths, 1975) [743]; *P. schokalskii* Gurjanova, 1946, 1951 [220B]; *P. schulekini* Gurjanova, 1946, 1951 [207 + B]; *P. tunda* J.L. Barnard, 1962c, 1966a [310B]; *P. typica* (Walker, 1906c, 1907) (Schellenberg, 1926a) (K.H. Barnard, 1932) [870 + 833]; *P. zuhovi* Gurjanova, 1951 [220 + B].

**Habitat and distribution.** Marine, mostly cold water Atlantic boreal, tropical submergent, also Antarctica, S. Africa, 5-3716 m, 14 species.
and Protholoides in the 1-articulate (versus 2 to 3-articulate) mandibular palp; from Stenula in the 2-articulate palp of maxilla 1.

**Species.** Prostenothoe sextonae Gurjanova, 1938b, 1951 [280].

**Habitat and distribution.** Marine, Japan and Okhotsk Seas, shallow water, 1 species.

*Prothaumatelson* Schellenberg

Figs 124H, 126D

*Prothaumatelson* Schellenberg, 1931: 113.

**Type species.** Thaumatelson nasutum Chevreux, 1912a,d, monotypy.

**Diagnosis.** Antenna 1 bearing nasiform process on article 1. Accessory flagellum absent. Palp of mandible 1-articulate; palp of maxilla 1 2-articulate. Inner plate of maxilla 2 ordinary. Inner plates of maxillipeds well separated. Gnathopods 1-2 grossly different from each other in size and shape, gnathopod 1 small, subchelate; article 5 incipiently chelate; article 4 short, expanded. Gnathopod 2 enlarged, grossly chelate in the presence of a nasiform process on antenna 1. Accessory flagellum rudimentary. Palp of maxilla 2 ordinary. Inner plates of maxillipeds well separated. Gnathopods 1-2 subchelate, in male different from each other in size and shape, gnathopod 1 smaller, palm oblique and as long as posterior margin of propodus; article 4 incipiently chelate; article 5 short, weakly lobed; article 6 expanded. Gnathopod 2 enlarged, palm strongly oblique, articles 4-5 short, lobed. Pereopods 5-7 with rectilinear article 2. Pereonite 4 slightly elongate and tumid. Pleonites 5-6 free; pleonite 3 lacking dorsal process; pleonite 4 strongly extended posterodorsally. Telson flat but fleshy, lateral surface area smaller than lateral area of urosomites 2-3 together.

**Relationship.** Differing from Parathaumatelson in the presence of a mandibular palp and accessory flagellum and in the strong dissimilarity between gnathopods 1 and 2; from Raumahara in the non-chelate gnathopod 2 and presence of nasiform process on antenna 1.

**Species.** Pseudothaumatelson cyproides Nicholls, 1938 [878]; P. patagonicum Schellenberg, 1931 [831].

**Habitat and distribution.** Marine, Antarctica and Patagonia, 46-197 m, 2 species.

*Raumahara* J.L. Barnard

Figs 124IJ, 125C, 126I


**Type species.** Raumahara derrroo J.L. Barnard, 1972a, original designation.

**Diagnosis.** Antenna 1 lacking nasiform process on article 1. Accessory flagellum absent. Palp of mandible absent; palp of maxilla 1 2-articulate. Inner plate of maxilla 2 ordinary. Inner plates of maxillipeds well separated. Gnathopods 1-2 chelate, scarcely different from each other in size and shape, gnathopod 1 shorter, article 4 incipiently chelate; article 5 elongate short, barely lobed; article 6 expanded but sublinear. Gnathopod 2 longer, articles 4-5 short, 5 lobed. Pereopods 5-7 with rectilinear article 2. Pereonite 4 slightly elongate. Pleonites 5-6 free; pleonite 3 ordinary, pleonite 4 strongly extended posterodorsally. Telson ordinary, flat, fleshy.

**Variables.** Ocular lobe enlarged (*R. noko*); epistomal keel with deep notch (*R. rongo*); mandible with vestigial palp (*R. noko*); gnathopod 1 not chelate (*R. carinatum*, *R. rongo*), palm oblique (*R. carinatum*), transverse (*R. rongo*); pleonite 4 not extended
(R. rongo); article 2 on ramus of uropod 3 thick (R. rongo), seta-like (type).

**Relationship.** Differing from *Parathaumatelson* and *Pseudothaumatelson* in the chelate gnathopod 2 and simple antenna 1.


**Habitat and distribution.** Marine, Beaufort Arctic, cold water Australia and New Zealand, 0-66 m, 5 species.

**Stenothea Dana**

Figs 124A, 126G


*Microstenothoe* Pirlot, 1933b: 2 (Microstenothoe *ascidiae* Pirlot, 1933b, original designation).

**Type species.** *Stenothea valida* Dana, 1853, monotypy.

**Diagnosis.** Antenna 1 lacking nasiform process on article 1. Accessory flagellum absent or 1-articulate. Palp of mandible absent; palp of maxilla 1 2-articulate. Inner plate of maxilla 2 unproduced. Inner plates of maxillipeds well separated. Gnathopods 1-2 subchelate, very different from each other in size and shape, gnathopod 1 small, subchelate, palm oblique and as long as posterior margin of propodus; article 4 incipiently chelate; article 5 shorter than 6, lobed; article 6 expanded. Gnathopod 2 enlarged, palm strongly oblique, article 4 elongate, lobed, article 5 short, lobed. Pereopods 5 with rectilinear article 2, pereopods 6-7 with expanded and lobate article 2. Pteryonot 4 ordinary. Pleonites 3 lacking dorsal process; pleonites 4 not extended posterodorsally. Telson ordinary, flat.

**Variables.** Accessory flagellum 1-articulate (e.g. *Microstenothoe asidiae*); inner plate of maxilla 2 frequently produced but not in type; inner plates of maxillipeds partly fused and very small (?S. *miarsi*); article 5 of gnathopod 1 not lobed *S. antennariae*; gnathopod 1 almost as large as and like gnathopod 2 (S. *woka*, but various species intermediate this extreme), but differing from gnathopod 2 (S. *kaia*); article 5 of gnathopod 1 often shorter than 6, often very short or as long as 6; gnathopods 1-2 often almost identical in shape but gnathopod 1 small (e.g. *S. monoculoides*); gnathopod 2 small like gnathopod 1 (S. *tergesitina*); article 2 of pereopod 6 narrower than article 2 of pereopod 7 (e.g. *S. elachista*); S. *woka*; pereopods prehensile (S. *symbiotica*); body carinate and toothed (S. *richardi*); uropod 1 with peduncular spur (?S. *miarsi*).

**Relationship.** Differing from *Metopoides*, *Probolooides*, *Prostenothoe* and *Stenula* in the loss of the mandibular palp. From *Metopa* and *Stenula* in the 2-articulate palp of maxilla 1.

**Species.** See Chevreux & Fage (1925), Gurjanova (1951), Nayar (1959, 1967), Schellenberg (1942), Sivaprakasam (1969a), Stephensen (1938b); *S. adhaerens* Stebbing, 1888 (Griffiths, 1975) (Ledyger, 1986) [743 + B]; ?S. *aequicornis* Stephensen, 1931a (gnathopod 1 wrong, mouthparts unknown) [209B]; S. *allinga* J.L. Barnard, 1974b [787]; *S. antennariae* Dana, 1857 (Krapp-Schickel, 1976a) [348 + 1 + 1574]; *S. ascidiae* (Pirlot, 1933b) (Toulmand & Truchet, 1964) [2421]; S. *acklandicus* Stephensen, 1927a [843]; S. *barrowensis* Shoemaker, 1955a (Vader, 1983b) [267]; S. *boophorana* Sowinsky, 1897, 1898 (Krapp-Schickel, 1976a) (= *S. dactylopotes* Chevreux, 1908g, Ledyger, 1977) (= S. *dentimana* Chevreux, 1911d) [330 + 339]; S. *brevicornis* Sars, 1883, 1895 (Vader, 1983b), S. *b. canadenis* Dunbar, 1954 [238 + 1]; S. *cattii* Stebbing, 1906 (Lincoln, 1979a) [352]; S. *cavimana* Chevreux, 1908 (Krapp-Schickel, 1976a) [352]; S. *coutieri* Chevreux, 1908g, 1935 [304B]; S. *crassicornis* Walker, 1897 (Lincoln, 1979a) [239]; S. *dolichopus* K.H. Barnard, 1916 (linear gnathopod 1) (Griffiths, 1974c) [743]; S. *dolllusi* Chevreux, 1887b, 1891a, 1900a (Krapp-Schickel, 1976a) [330 + B]; S. *edwardi* Krapp-Schickel, 1976a (= S. *cattii* identification of Chevreux & Fage, 1925, Ledyger, 1973c) (= S. *gallensis* identification of Reid, 1951) [348]; S. *elachistoides* Myers & McGrath, 1980 [239]; S. *elachista* Krapp-Schickel, 1976a [348]; S. *estacola* J.L. Barnard, 1962c, 1969a [373]; S. *falklandica* Schellenberg, 1931 [831]; S. *frecanda* J.L. Barnard, 1962c, 1966b [370]; S. *gallensis* Walker, 1904 (J.L. Barnard, 1955a) (Ledyger, 1972c) (Krapp-Schickel, 1976c) (Ledyger, 1978a, 1986) (= S. *crenulata* Chevreux, 1907a, 1908c) [423T]; S. *georgiana* Bynum & Fox, 1977 [362]; S. *guerrini* Bate 1862 (Stebbing, 1906) [660]; S. *haleloke* J.L. Barnard, 1970a [381]; S. *imemis* Ledyger, 1979a, 1986 [698]; S. *irakissi* Salmon, 1983 [763]; S. *kaia* Myers, 1985c [576]; S. *longimana* Bate, 1862 (Stebbing, 1906) [348]; S. *macrophalina* Stephensen, 1931a (gnathopod 1 wrong, mouthparts unknown) [209B]; S. *marina* Bate, 1857d (Sars, 1895) (J.L. Barnard, 1979a) (Krapp-Schickel, 1976a) (Ledyger, 1977) (Vader, 1984b) (= S. *dansai* Bocck, 1861); S. *mediterranea* Ledyger, 1973c [350 + 370 + 660 + 367 + 1]; S. *megalheir* Boeck, 1871b, 1876 (Sars, 1895) (Stephensen, 1938b) [238 + B]; S. *microps* Sars, 1895 (Stephensen, 1929b) [240]; S. *miarsi* (Haswell, 1879b) (J.L. Barnard, 1974b) (= S. *longicornis* Chevreux, 1879b) [781 + 788]; S. *minuta* Holmes, 1905 (Bousfield, 1973) [361]; S. *moe* J.L. Barnard, 1972b [775];
Stenothoides Chevreux


Mesostenothoides Gurjanova, 1938b: 280 (Mesostenothoides pirloti Gurjanova, 1938b, original designation).

Type species. Stenothoides perrieri Chevreux, 1900a, monotypy.

Diagnosis. Antenna 1 lacking naismiform process on article 1. Accessory flagellum absent. Palp of mandible 1-articulate; palp of maxilla 1-larticulate. Inner plate of maxilla 2 ordinary. Inner plates of maxillipeds well separated. Gnathopods 1-2 subchelate, different from each other in size and shape, gnathopod 1 small, subchelate, palm oblique and as long as posterior margin of propodus; article 4 incipiently chelate; article 5 as long as 6, barey lobed; article 6 expanded. Gnathopod 2 enlarged, palm almost transverse, almost obsolete; article 5 short, lobed. Peregopods 5-6 with rectilinear article 2, pereopod 7 with slightly expanded and lobate article 2. Peregone 4 ordinary. Pleonites 4-6 free; pleonite 3 lacking dorsal process; pleonite 4 not extended posterodorsally. Telson ordinary, flat.

Variables. Eyes large (e.g. S. modosa); gnathopod 1 distinctly subchelate (e.g. S. carinatus); back carinate (S. carinatus).

Relationship. Differing from Parametopa in the presence of a mandibular palp to 1 article. From Mesoproboloides in the 1-articulate palp of maxilla 1.

Species. See J.L. Barnard (1962c); S. bicaoma J.L. Barnard, 1962c, 1964b, 1966a [370]; S. burbanki J.L. Barnard, 1969a [372]; S. perrieri Chevreux, 1900a (Vader, 1978) [255]; S. pirloti (Gurjanova, 1938b, 1951) [280]; S. slaturnikovi (Gurjanova, 1948, 1951) [279]; S. smirnovi (Gurjanova, 1948, 1951) [279]; S. uenoii (Gurjanova, 1938b, 1951) [280].

Habitat and distribution. Marine, cold North Pacific, Bering Sea, and cold north-western Atlantic, 0-218 m, 7 species.

Stenula J.L. Barnard


Type species. Stenothoides latipes Chevreux & Fage, 1925, original designation.

Diagnosis. Antenna 1 lacking naismiform process on article 1. Accessory flagellum absent. Palp of mandible 1-articulate; palp of maxilla 1-larticulate. Inner plate of maxilla 2 ordinary. Inner plates of maxillipeds well separated. Gnathopod 1 small, almost simple, article 4 incipiently chelate; article 5 elongate, unlobed; article 6 almost linear. Gnathopod 2 slightly enlarged, palm weakly oblique, article 5 short, lobed. Peregopod 5 with rectilinear article 2, pereopods 6-7 with expanded and article 2. Pereonite 4 ordinary. Pleonites 4-6 free; pleonite 3 lacking dorsal process; pleonite 4 not extended posterodorsally. Telson ordinary, flat.

Variables. Eyes large (e.g. S. modosa); gnathopod 1 distinctly subchelate (e.g. S. carinatus); back carinate (S. carinatus).

Relationship. Differing from Parametopa in the presence of a mandibular palp. From Mesoproboloides in the expanded article 2 of pereopod 6. From Metopa in the reduction of the mandibular palp to 1 article. From Mesoproboloides in the 1-articulate palp of maxilla 1.
(Lincoln, 1979a) (= *S. latipes* Chevreux & Fage, 1925) [216 +1 + B]; *S. serripes* Gurjanova, 1955b [286]; *S. ussuriensis* Gurjanova, 1951 [391].

**Habitat and distribution.** Marine, Arctic-boreal south to California and France, 0-1000 m, 11 species.

*Thaumatelson* Walker

Figs 124C, 125A, 126E


**Type species.** *Thaumatelson herdmani* Walker, 1906c, 1907, monotypy.

**Diagnosis.** Antenna 1 lacking nasiform process on article 1, bearing one on article 2. Accessory flagellum absent. Palp of mandible 3-articulate; palp of maxilla 1 2-articulate. Inner plate of maxilla 2 ordinary. Inner plates of maxillipeds well separated. Gnathopods 1-2 different from each other in size and shape, gnathopod 1 small, almost simple or weakly subchelate, palm oblique and shorter than posterior margin of propodus; article 4 incipiently chelate; article 5 elongate, unlobed; article 6 long, weakly expanded. Gnathopod 2 enlarged, palm strongly oblique, article 5 short, lobed. Pereopods 5-7 with rectilinear article 2 bearing posteroverentral lobe, pereopods 6-7 with expanded and lobate article 2. Pereonite 4 ordinary. Pleonites 4-6 free; pleonite 3 lacking dorsal process; pleonite 4 not weakly extended posterodorsally. Telson ordinary, flat.


**Relationship.** Differing from *Metopoides* and *Proboloides* in the lobation on article 2 of pereopod 5.

**Species.** *Thorometopa aequalis* (J.L. Barnard, 1962d) [416A]; *T. antarctica* (Walker, 1906c, 1907) (K.H. Barnard, 1932) [871B]; ? *T. armata* (Ledoyer, 1986) [618A]; *T. carinata* (Schellenberg, 1931) (K.H. Barnard, 1932) [833 + B]; *T. compacta* (Stebbing, 1888) (Schellenberg, 1931) [867 + B]; *T. crassicornis* (Schellenberg, 1931) [831]; *T. crenatipalmata* (Stebbing, 1888) (K.H. Barnard, 1932) (Bellan-Santini, 1972b) [867 + 731 + B]; *T. dentimana* (Nicholls, 1938) (Bellan-Santini, 1972a, b) [870 + B]; *T. palmata* (Ruffo, 1949) [802B]; *T. parallelocheir* (Stebbing, 1888) (Schellenberg, 1931) (K.H. Barnard, 1932) [867]; *T. perlata* (K.H. Barnard, 1930) [893]; *T. porcellana* (K.H. Barnard, 1932) [831]; *T. stephensi* (Ruffo, 1949) [802B].

**Habitat and distribution.** Marine, Antarctica and austral, north to Tristan da Cunha and Magellan area, into deep southern basins, 10-4986 m, 12 species.

*Vonimetopa* Barnard & Karaman


**Type species.** *Metopella dubia* Shoemaker, 1964, original designation.

**Diagnosis.** Antenna 1 lacking nasiform process on article 1. Accessory flagellum 0 to 2-articulate. Palp of mandible 3-articulate; palp of maxilla 1 2-articulate. Inner plate of maxilla 2 ordinary. Inner plates of maxillipeds well separated. Gnathopods 1-2 different from each other in size and shape, gnathopod 1 small, almost simple or weakly subchelate, palm oblique and shorter than posterior margin of propodus; article 4 incipiently chelate; article 5 elongate, unlobed; article 6 elongate, linear. Gnathopod 2 weakly enlarged, palm strongly oblique,
article 5 short, lobed. Pereopods 5-7 with rectilinear article 2. Pereonite 4 ordinary. Pleonites 4-6 free; pleonite 3 lacking dorsal process; pleonite 4 not weakly extended posterodorsally. Telson ordinary, flat.

Relationship. Differing from Metopelloides in the elongate simple propodus and short lobed carpus of gnathopod 1, and the fully separated inner plates of the maxillipeds.

See Zaikometopa.

Species. Vonimetopa barnardi (Gurjanova, 1938b, 1951) [280]; V. brazhnikovi (Gurjanova, 1948, 1951) (Kudrjaschov & Zejagintsev, 1975) [280]; V. dabia (Shoemaker, 1964) [277]; V. schellenbergi (Gurjanova, 1938b, 1951) [391]; V. shoemakeri (Gurjanova, 1938b, 1951) (Kudrjaschov, 1979a) [280]; V. zernovi (Gurjanova, 1948, 1951) [391].

Habitat and distribution. Marine, Bering Sea, Okhotsk Sea, Japan Sea, shallow to 5 m, 6 species.

Wallametopa J.L. Barnard


Type species. Wallametopa cabon J.L. Barnard, 1974b, original designation.

Diagnosis. Antenna 1 lacking nasiform process on article 1. Accessory flagellum 1-articulate, scale-like. Palp of mandible absent; palp of maxilla 1 2-articulate. Inner plate of maxilla 2 produced. Inner plates of maxillipeds well separated. Gnathopod 1 small, simple, dactyl short and stubby, article 4 incipiently chelate; article 5 elongate, unlobed; article 6 short, linear. Gnathopod 2 enlarged, palm strongly oblique; articles 4-5 short, lobed. Pereopods 5 with rectilinear article 2, pereopods 6-7 with expanded and lobate article 2. Pereonite 4 ordinary. Pleonites 4-6 free; pleonite 3 lacking dorsal process; pleonite 4 weakly extended posterodorsally. Telson ordinary, flat.

Relationship. Differing from Parametopa in the elongate article 5 of gnathopod 1 and enlarged gnathopod 2.

See Knysmetopa.

Species. Wallametopa cabon J.L. Barnard, 1974b (Ledoyer, 1979a, 1986) [782 + 698].

Habitat and distribution. Marine, south-eastern Australia to Madagascar, 15-49 m, 1 species.

Zaikometopa Barnard & Karaman


Diagnosis. Antenna 1 bearing nasiform process on article 1. Accessory flagellum 1-articulate. Palp of mandible 1-articulate; palp of maxilla 1 2-articulate. Inner plate of maxilla 2 ordinary. Inner plates of maxillipeds mostly fused together. Coxa 2 small and hidden by coxa 3. Gnathopod 1 small, simple, article 4 incipiently chelate; article 5 short, unlobed; article 6 elongate, linear. Gnathopod 2 enlarged, palm parachelate, article 5 short, lobed. Pereopods 5-7 with rectilinear article 2. Pereonite 4 highly elongate. Pleonites 4-6 free; pleonite 3 lacking dorsal process; pleonite 4 strongly carinate posterodorsally. Telson ordinary, flat.

Relationship. Differing from Metopelloides and Vonimetopa in the nasiform lobe on article 1 of antenna 1, the mostly fused inner plates of the maxillipeds and the carinate urosomites 1. From Metopelloides also in the short lobed carpus and elongate simple propodus of gnathopod 1; and the unusually small coxa 2 hidden by coxa 3.


Habitat and distribution. Marine, Gulf of Alaska westward along Alaskan Peninsula, 0 m, 1 species.

STILIPEDIDAE Holmes, 1908

Astyridae Pirot, 1934: 175.

Diagnosis. Antenna 1 shorter than antenna 2. Accessory flagellum 0 to 2-articulate. Mandible flat, molar simple or absent, mandibular palp present. Coxa 1 broader than 2 or 3, expanded distally, occasionally coxae tending to acumination but never sharply, coxa 4 excavate posteriorly. Gnathopods feeble, simple, carpus dominant. Article 2 of pereopod 7 distinct from article 2 of pereopods 5-6. Uropod 3 with short peduncle, very long rami (often one or both lost). Urosomite 1 with carina. Telson short, cleft or entire.

See Eusiridae (Calliopiidae, Pontogeneiidae), Haustoriidae, Hyperopiidae, Iphimiidae, Laphystiopsidae, Liljeborgiidae, Oediceridae, Pardaliscidae, Pleustidae, Synopiidae and Vitjazianidae.

Description. Body compressed laterally, stout anteriorly, often carinate posterodorsally, urosomites free, rostrum small, head large, ordinary or weakly galeate or tuberoid (shark-nosed); lateral cephalic lobes flush or weakly protruding, lacking deep insertion declivity for antenna 2, antennal corner often produced to form cavity around base of antenna 2; eyes absent or present (rare). Antennae long to medium but peduncles
very short, articles 2-3 of peduncle on antenna 1 very short, primary flagellum stout, articles short (proliferate, very strongly setulose, aesthetised or pubescent), those of antenna 2 less strongly setulose. Labrum variable, often deeply incised. Mandibular palp slender, article 3 much shorter than 2. Lower lip variable, inner lobes weak or absent, medial gape absent or strong, mandibular lobes extended, often pointed. Maxillae variable but medial margins of inner plates on both pairs moderately to strongly setose, no major facial setae (rarely *Bathypanoploea*). Maxillipeds well developed, inner plate moderate to strong but outer plate very large, medially armed, palp variable but 4-articulate, dactyl often feeble.

Coxa 1 often very broadly adze-shaped, coxae 2-3 usually tapering and narrow, coxa 4 subacuminate, thus ventral margin oblique, poorly to strongly excavate posteriorly, coxae 5-7 short. Carpus of gnathopods as long as but broader than propodus, lobate or not, gnathopods stout or slender but palms absent. Pereopods 3-7 of ordinary elongation. Epimera large, stable, poorly sculptured. Pleopods well developed. Urosomite 1 with dorsal notch or carina. Uropods 1-2 long, spinose, outer ramus of uropod 2 usually shortened. Uropod 3 scarcely exceeding other uropods, peduncle short, rami long, lanceolate. Telson poorly ornamented.

**Relationship.** Very close to Iphimediidae, especially intergrading to, by and through *Epimeriella-Eclysis* which share similar maxillae, maxillipeds and gnathopods or article 2 of pereopods 5-7 (diverse). The subacuminate coxae of several stilipedids also come close to iphimediid conditions. Probably the broader coxa 1, being much broader than coxae 2 or 3, is the best distinction. Most stilipedids can be recognised by the strange lower lips and by the identical gnathopods with broad dominant carpus and thinner, feeble, simple propodus.

Somewhat to the ancestral side of Stegocephalidae in bearing mandibular palp; otherwise most characters of Stegocephalidae are present.

Stilipedids differ from most Eusiridae in the feeble or absent molars, in the simple gnathopods with dominant carpus and the broadened coxa 1. See the Key to the Genera of Eusiridae for the place where Stilipedidae emerge.

Differing from Pardaliscidae in the longer coxae; from all but the exceptional member of Oedicerotidae in the short peduncle of uropod 3; from Synopiidae in the feeble to absent molar and very short peduncle of antenna 1; from *Hyperiopsidae* in the broadened coxa 1 and ordinary pereopods 3-4 with non elongate article 4; from *Vijizianidae* in the long coxae, broadened coxa 1, evanescent molar, short accessory flagellum and short basal article of primary flagellum on antenna 1; from most Pleustidae in the simple gnathopods combined with enlarged outer plate of the maxilliped; from *Liljeborgiidae* in the simple gnathopods (note how *Liljeborgiidae* have the similar broadened coxa 1 and enlarged plates of the maxillipeds); from *Laphystiopsidae* in the long coxae and strongly setose inner plate of maxilla 1; and from *Haustorioidae* in the non fossorial pereopods and antennae and generally acquiramous uropod 3 with long rami.

The Stilipedidae are unified by the broad coxa 1, narrower coxae 2-3, the feeble gnathopods with the dominant carpus, the propodus dependent and simple (few iphimediids have both gnathopods identical and simple) and the diversity of article 2 on pereopod 7 versus pereopods 5-6.

This family is divided into groups by Holman & Watling (1983a) as follows: Astyrinae, Alexandrellinae and Stilipedinae, with *Alexandrella* and *Bathypanoploea* placed in the Alexandrellinae.

**Key to Genera of Stilipedidae**

1. Coxa 1 subacuminate, blunt or not significantly broader than coxa 2 ................................................................. *(Iphimediidae)* *Epimeriella* .......................... 2
   —Coxa 1 rounded-truncate, broader than coxa 2 ................................................................. 2

2. Antenna 1 and body with large sharp teeth ................................................................. 3
   —Antenna 1 and body with small or no teeth ................................................................. 4

3. Palp of maxilla 1 1-articulate ................................................................. *Astyroides* .......................... 5
   —Palp of maxilla 1 2-articulate ................................................................. *Bathypanoploea* .......................... 5

4. Mandible and maxillae 1-2 of ordinary dimensions, incisor narrow, molar present, [article 2 of pereopods 5-6 setose posterovertrally] .......................... 5
   —Mandible and maxillae 1-2 immensely broadened, incisor broad, molar absent, [article 2 of pereopods 5-6 naked posterovertrally] .......................... 6
5. Lacinia mobilis absent, outer lobes of lower lip weakly separated, dactyl of maxillipedal palps not serrate ............................. Eclysis

--- Lacinia mobilis present, outer lobes of lower lip strongly separated, dactyl of maxillipedal palps serrate ........................... Astyra (= Chagosia, Parastyra)

6. Palp of maxilliped greatly exceeding outer plate, labrum weakly emarginate, incisor smooth, right lacinia mobilis absent ........................................................... Stilipes (= Cacao)

--- Palp of maxilliped not reaching apex of outer plate, labrum deeply incised, right lacinia mobilis present ............ Alexandrella (= Pseudandaniexis)

**Alexandrella** Chevreux

*Fig. 127C*

*Alexandrella* Chevreux, 1912a: 7--Chevreux, 1912d: 134.

Holman & Watling, 1983a: 32.

*Parandaniexis* Nicholls, 1938: 42 (Parandaniexis mixtus Nicholls, 1938, original designation) [homonym, Amphipoda].

*Pseudandaniexis* Nicholls, 1938: corrigendum (new name, same type species).

**Iphimediopsis** Schellenberg, 1931: 126 (Acanthonotoconoma australis Chilton, 1912d, monotypy, but misidentified, see *Bathypanoploea*) [homonym, not Della Valle, 1893].

*Bathypanoploea* Schellenberg, 1939: 137 (new name for *Iphimediopsis* Schellenberg, same type species).

*Pseudiphimediopsis* Ruffo, 1949: 18 (new name for *Iphimediopsis* Schellenberg, same type species).

Type species. *Alexandrella dentata* Chevreux, 1912a, original designation.

**Diagnosis.** Labrum deeply incised, lobes asymmetrical. Mandibles very broad, very flat, incisor broad, minutely crenulate to strongly toothed, left lacinia mobilis present, right present or absent (type), raker row absent, molar absent. Maxillae 1-2 broadly expanded, palp of maxilla 1-2-articulate and often bent (type). Basal setae of inner plate on maxilla 2 elongate. Palp of maxilliped not reaching apex of outer plate. Carpus of gnathopods not lobate. Article 2 of pereopods 5-6 laterally smooth, narrow, mostly asetose, of pereopod 7 much broader, more deeply lobate, posterior margin excavate.

**Description.** Sides of pereonites each with small cusp well above top edges of coxae (type). Eyes absent (or poorly apparent). Outer lobes of lower lip large, appressed, inner lobes weak, split, or absent, mandibular lobes well developed. Inner plate of maxilla 1 subquadrate, fully setose medially, outer plate with 11 spines, palp stout. Inner plate of maxilla 2 broad, short, often adze-shaped (type), fully setose medially, outer plate broad basally, then tapering distally, setose medially and apically. Article 2 of pereopods 5-6 moderately expanded, ovatoretangular, lobate posteroventrally, of pereopod 7 broadly expanded, lobate or not, posterior edge angularly sculptured. Telson with weak, complex apical excavation. Gills simple, on coxae 2-7, ovate to pyriform; postperitremes expanded, tear drop shaped, well setose.

**Sexual dimorphism.** Unknown; antennae of both sexes with tufts of antennules somewhat as in *Astyra* but bundles on flagellum of antenna 1 often widely dispersed and antenna 2 with facial bundles mainly on articles 2-3 of peduncle, rarely article 4.

**Variables.** Antenna 1 with or without tooth; incisor toothed or smooth; inner lobes of labium present or absent; posteroventral corner of coxa 5 blunt or acute; posteroventral corner of article 2 on pereopod 7 blunt or acute.

**Relationship.** Differing from *Astyra* in the flabellate mandible and maxillae, and the absent molar. See *Stilipes* and *Bathypanoploea*.

**Species.** *Alexandrella australis* (Chilton, 1912d) (not Schellenberg, 1931) (Holman & Watling, 1983a) [880BA]; *A. dentata* Chevreux, 1912d (J.L. Barnard, 1961a) (Holman & Watling, 1983a) [880BA]; *A. insignis* Bellan-Santini & Leloyer, 1986 [799]; *A. mixta* (Nicholls, 1938) (Bellan-Santini, 1972) (Holman & Watling, 1983a) [787 + 714A]; *A. subhelata* Holman & Watling, 1983a [717B].

**Habitat and distribution.** Marine, cosmopolitan (probably), cold water, 60-7210 m, 4 species.

**Astyra** Boeck, new synonymy

*Fig. 128A,B,C,D*

*Astyra* Boeck, 1871b: 133.


*Parastyrta* Piriot, 1934: 176 (Parastyrta longidactyla Piriot, 1934, original designation).

Type species. *Astyra abyssi* Boeck, 1871b, monotypy.
**Diagnosis.** Labrum scarcely incised. Mandibles narrow, very flat, twisted, incisor narrow, toothed, right lacinia mobilis absent, left present, raker row well developed, molar long, conical, simple, setose. Maxillae 1-2 almost ordinary, not immensely broadened though inner plate of maxilla 2 broader than ordinary (see Fig.128A), palp of maxilla 1 2-articulate. Palp of maxilliped exceeding apex of outer plate. Carpus of gnathopods weakly lobate or moderately carpochelate. Article 2 of pereopods 5-6 with setose lateral ridge.

![Fig.127. Stilipedidae. A, Stilipes distincta; B, Stilipes sanguineus; C, Alexandrella dentata.](image_url)
Description. Eyes present or absent. Accessory flagellum present or absent. Outer lobes of lower lip large, widely separated by gape, space empty or filled with weak but split inner lobes, mandibular lobes well developed. Inner plate of maxilla 1 thickly triangular, with about 7 medial setae towards apex; outer plate with 9 spines, palp slender. Inner plate of maxilla 2 broad, short, apically setose, outer plate narrow, elongate, apically setose. Dactyls of gnathopods serrate. Article 2 of pereopods 5-6 moderately expanded and ovato-rectangular, posteroventrally lobate, of pereopods 7 broadly expanded, lobate, with angular sculpture on posterior edge. Telson cleft halfway (type). Gills simple, on coxae 2-7, ovate to pyriform; oostegites weakly expanded, tear drop shaped, well setose.

Sexual dimorphism. Weak; both sexes of A. abyssi with Ampelisca-like setular bundles on anterior margins of articles 4-5 on antenna 2 and medium to long bundles on articles of flagellum on antenna 1.

Variables. Inner ramus of uropod 3 frequently broken off, thereby leaving uropod 3 apparently unicarnate or showing from dorsal view peduncular process that looks like scaphform inner ramus.

Dactyls of pereopods 3-7 elongate (A. longidactyla-longipes) or short (A. carinatus); gnathopods carpochelate (A. gardineri) or not (A. carinata); corner of head produced (A. abyssi) or head plough-shaped (A. gardineri, A. longidactyla); inner plate of maxilla 1 very setose (A. zenkevitchi); telson cleft (type), barely incised (A. zenkevitchi); pleonites 2-3 carinate (A. longipes).

Astyra longidactyla appearing distinct from A. gardineri on (1) shape of gnathopod 1; (2) shape of article 2 on pereopod 6 (2 interpretations); (3) shape of coxa 4; (4) slope of palpus on gnathopods 1-2; (5) head, telson cleft (type), barely incised (A. zenkevitchi); pleonites 2-3 carinate (A. longipes).

Relationship. Differing from Stilipes and Alexandrella in the narrower mandible and incisor and unexpanded maxillae.

Astyra vaguely looks like Cleippides in the Iphimechinidae but Astyra is characterised by toothed incisor, small simple molars (contrast large ringed incisor and molars), short inner plate of maxilla 2 lacking facial setae, large outer plate of maxilliped with medial spine (Cleippides is short and medially naked), short
articles 1-2 of antenna 1, and gaping lower lip.

Species. See Gurjanova (1951); Stephensen (1931a, 1938b, 1940b); A. abyssi Boeck, 1871b (Sars, 1895) [216 + B]; A. bogoheri Birstein & Vinogradov, 1955, 1958 [230A]; A. gardneri (Walker, 1909b) (= A. longidactyla Pirlot, 1934) (Birstein & Vinogradov, 1964) [660B]; A. longidactyla (Pirlot, 1934) [7600]; A. longipes Stephensen, 1933b [212B]; A. similis (K. H. Barnard, 1932)[833]; A. zenkevitchi Birstein & Vinogradov, 1955, 1958, 1964 [280A + 660A].

Habitat and distribution. Marine, Kurile-Kamchatka, cold water pelagic or demersal, 100-2350 m, 7 species.

Astyroides Birstein & Vinogradova

Astyroides Birstein & Vinogradova, 1960: 152.

Type species. Astyroides carinatus Birstein & Vinogradova, 1960, original designation.

Diagnosis. Like Bathypanoploea but palp of maxilla 1 1-articulate.

Species. Astyroides carinata Birstein & Vinogradova, 1960 [231A].

Habitat and distribution. Marine, Kurile-Kamchatka Trench, 7210-7230 m, 1 species.

Bathypanoploea Schellenberg [also in Iphimediidae]

Bathypanoploea Holman & Watting, 1983: 47 (requesting type be changed to Bathypanoploea schellenbergi Holman & Watting, 1983 to overcome erroneous original identification by Schellenberg, 1931).

Epimeriopsis K.H. Barnard, 1931a: 428 [void ab initio], not Iphimediopsis Schellenberg, 1931: 126 (Acanthonotozoma australis Chilton, 1912d, monotypy, but misidentified) [homonym, not Della Valle, 1893] (= Alexandrella).

not Bathypanoploea Schellenberg, 1939: 137 (new name for Iphimediopsis Schellenberg, same type species) (= Alexandrella).

not Pseudoiphimediopsis Ruffo, 1949: 18 (new name for Iphimediopsis Schellenberg, same type species) (= Alexandrella).

Type species. Bathypanoploea schellenbergi Holman & Watting, 1983.

Diagnosis. Labrum scarcely incised. Mandibles narrow, not very flat, [?twisted], incisor narrow, toothed, right lacinia mobilis absent, left absent, raker row present, molar long, conical, simple, setose. Maxillae 1-2 moderately broadened, palp of maxilla 1 2-articulate. Basal setae on inner plate of maxilla 2 not elongate. Palp of maxilliped much shorter than outer plate. Carpus of gnathopods not lobate. Article 2 of pereopods 5-6 lacking ridge and lobe; article 2 of pereopod 7 excavate, lobate above and below, lacking setose ridge.

Description. Eyes absent. Accessory flagellum 1-articulate. Outer lobes of lower lip large, separated by gape, space filled with shallow inner lobes, mandibular lobes well developed. Inner plate of maxilla 1 thickly triangular, medially setose, with several scattered facial setules; outer plate with 9 spines; palp slender, medially spinose. Plates of maxilla 2 broad, apically setose. Dactyls of gnathopods pectinate. Article 2 of pereopods 5-6 moderately expanded and ovatorectangular, scarcely lobate. Telson cleft one fourth to one third. Gills [unknown]; oostegites [unknown].

Relationship. In the Iphimediidae this genus would differ from Acanthonotozoma in the similarity of gnathopods 1-2 to each other, the nonparasitic mouthparts and the short strong incisor. Differing from Epimeria and allies in the absence of the molar; from Epimeriella in the blunt coxae 1-3 and noncrescentic form of coxae 3-4.

Differing from other stilipedids in the teeth on pereon, pleon and antenna 1. From Alexandrella especially in the presence of rakers, and the 2-articulate palp of maxilla 1. Alexandrella has elongate basomedial setae on the inner plate of maxilla 2.

Removal. Bathypanoploea australis Chilton, 1912d, to Alexandrella.

Species. Bathypanoploea schellenbergi Holman & Watting, 1983a (= B. australis identification of Schellenberg, 1931) [880 + B].

Habitat and distribution. Marine, South Georgia to Ross Sea area, 468-2675 m, 1 species.

Eclysis K.H. Barnard

Figs 760, 78F, 79H


Type species. Eclysis similis K.H. Barnard, 1932, monotypy.

Diagnosis. Labrum scarcely incised. Mandibles narrow, not very flat, [?twisted], incisor narrow, toothed, right lacinia mobilis absent, left absent, raker row present, molar long, conical, simple, setose. Maxillae 1-2 almost ordinary, not immensely broadened though palp of maxilla 1 slightly expanded, palp of maxilla 1 2-articulate. Palp of maxilliped exceeding apex of outer
plate. Carpus of gnathopods moderately lobate. Article 2 of pereopods 5-6 with [?non-setose] lateral ridge extending ventrally to form moderate posteroventral lobe; article 2 of pereopod 7 simple, lobate, posterior margin weakly concave.

**Description.** Eyes absent. Accessory flagellum present. Outer lobes of lower lip large, weakly separated by gape, space empty, mandibular lobes well developed. Inner plate of maxilla 1 thickly triangular, with about 7 medial setae towards apex; outer plate with 9 spines. Plates of maxilla 2 short, apically setose. Dactyls of gnathopods [?serrate]. Article 2 of pereopods 5-7 moderately expanded and ovato-rectangular, posteroventrally lobate. Telson cleft halfway. Pereonite 7, pleonites 1-4 dorsally toothed. Gills [?simple, on coxae 2-7, bovate to pyriform; oostegites [?weakly expanded, tear-drop shaped, [?well setose].

**Sexual dimorphism.** [?]Weak.

**Relationship.** Differing from *Astrya* in the lack of subiacina mobilis, the poorly spaced outer lobes of the lower lip, unserrate article 4 of the maxillipedal palp and pereopod 7 longer than pereopod 6.

**Species.** *Eclipsis similis* K.H. Barnard, 1932 (Andres & Wattling, 1996) [833].

**Habitat and distribution.** Marine, South Georgia, to 250 m, 1 species.

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**Epimeriella**

See Iphimediidae

**Elymurus** Holmes

Figs 127A, B

**Stilipes** Holmes

Figs 127A, B

**Stilipes** Holmes, 1908: 536.-Holman & Watling, 1983a: 28.

**Type species.** *Stilipes distincta* Holmes, 1908, original designation.

**Diagnosis.** Labrum weakly incised, lobes asymmetrical. Mandibles very broad, very flat, incisor broad, smooth (scarcely notched), left lacinia mobilis present, right absent, raker row absent, molar absent. Maxillae 1-2 broadly expanded, palp of maxilla 1 2-articulate. Palp of maxilliped strongly exceeding apex of outer plate. Carpus of gnathopods not lobate, gnathopods especially stout. Article 2 of pereopods 5-6 laterally smooth, narrow, mostly asetose, of pereopod 7 much broader, more deeply lobate, posterior margin excavate.

**Description.** Eyes present, below oval bulge on side of head. Accessory flagellum absent. Rostrum grotesque. Outer lobes of lower lip thin vertically (proximal to distal), with moderately medial gape, mandibular lobes well developed, sharp. Inner plate of maxilla 1 thin, apically setose, outer plate very broad, with about 17+ spines, palp flabellate. Inner plate of maxilla 2 broad, circular, short, outer plate similar, both setose medially. Coxa 4 especially small, smaller than coxa 1. Article 2 of pereopods 5-6 slender, weakly expanded, scarcely lobate, of pereopod 7 slightly more expanded, lobate posteroventrally, posterior edge regular; dactyl of pereopod 7 enlarged, oar-shaped. Telson narrowly incised. Gills folded and lobed (crumpled) on coxae 2-7; oostegites [unknown].

**Sexual dimorphism.** Antennae somewhat tufted as in *Astrya* in male only, female with ungrouped setae.

**Relationship.** Differing from *Alexandrella* in the long maxillipedal palp, the poorly emarginate labrum and the absent right lacinia mobilis.

**Species.** *Stilipes distincta* Holmes, 1908 (Gurjanova, 1952b) (Shoemaker, 1964) (Birstein & Vinogradov, 1970) [510B]; *S. lacteus* (K.H. Barnard, 1931a, 1932) [447B]; *S. sanguineus* (Hurley, 1954f) [715B].

**Habitat and distribution.** Marine, probably cosmopolitan, 230-620 m, 3 species.

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**SYNOPPIDAE** Dana, 1855

**Diagnosis.** Gammaridean with galeate head or with plough-shaped protuberance on forehead; accessory flagellum of antenna 1 large, multifidulate; upper lip fleshy, ventrally truncate, rounded or weakly incised, usually with small marginal hairs; mandibles with 3-articulate palp (3 exceptions), molar present and never amalgamated with spine row, latter often vestigial; lower lip with well-developed mandibular lobes, inner lobes present and separate from each other, no extraordinarily wide space occurring between outer lobes; maxillae 1-2 well developed but setation variable, palp of maxilla 1 2-articulate; inner and outer plates and palp of maxilliped well developed, palp usually 4-articulate, rarely 3; coxae 1 and 2 large and unhidden by posterior coxae, except coxa 1 rarely narrowed; gnathopod 1 present, 7-articulate; gnathopods not sexually dimorphic, gnathopod 2 not enlarged; pereopods 3-5 basic, pereopod 7 not grossly longer than 6 in contrast to Oedicerotidae; uropods 1-3 present, all strongly biramous; telson present.

See Cardenioidae and Platyischnopidae.
Sexual dimorphism. Males often with enlarged eyes (when present), elongate, more brushy antennae and enlarged posterior body teeth.

Morphology. 'Pelagont coxae' refers to an enlarged coxa 3 and reduced coxa 4, latter often comma-shaped.

Relationship. The galeate head, in combination with the presence of a macroscopic accessory flagellum, nonfleshy telson, reasonably proportional articles 5-6 of pereopods 3-4, well-developed molar, elongate telson (with one generic exception), unbroadened mandibular incisors, reasonably short article 3 of gnathopod 2, and slender peduncle of antenna 1 with articles 2 and 3 not strongly shortened or telescoped into article 1, distinguish synopiids from similar members of Haustorioidea, Oedicerotidae, Phoxocepalidae, Argissiidae, Eusiridae, (?Vitjazianidae), Stilipedidae, Iphimeididae, Stegocepalidae and Lysianassidae.

Synopiidae and Oedicerotidae are very similar morphologically. Synopiids differ from most Oedicerotidae in the short peduncle of uropod 3 (but one genus of Oedicerotidae has vestigial uropod 3). Synopiidae differ from Oedicerotidae in the presence of a conspicuous accessory flagellum.

The Stilipedidae differ from synopiids in the mandible, which bears a heavily and sharply serrate, sublabellate incisor, a swept, conical molar bearing setae and in the lower lip, which has a wide channel between the outer lobes. The excessively large number of raking spines on the mandible suggests a feeding behaviour distinct from the synopiids and more intensely adapted for raking than in most oedicerotids.

Synopiids are close to the basic gammaroidean but each genus of synopid taken by itself differs from marine gammaroideans (including section Gammarida) in bearing one or more of the following characters: huge mandibular molar, pelagont coxae, galeate head, elongate telson, gnathopodal shape, and shortened outer ramus of uropod 1 or 2.

Key to Genera of Synopiidae

1. Both telson and peduncle of uropod 3 very short and subequal in length, mandibular palp extremely stout.................................................Synopia

— Telson elongate, exceeding peduncle of uropod 3 even when peduncle elongate, mandibular palp not extremely stout .................................................................................................................. 2

2. Gnathopods simple ........................................................................................................ 3

— One or both gnathopods subchelate, with definite corner or defining spine ................................................................................................. 6

3. Rostrum with blunt apex, eyes absent, uropod 1 failing to reach apex of uropod 2 .................................................................Pseudotiron

— Rostrum with sharp apex, eyes absent, uropod 1 reaching apex of uropod 2 ..............................................................................4

— Rostrum with sharp apex, eyes present, uropod 1 reaching apex of uropod 2 .............................................................................. 5

4. Mandibular palp present, coxa 3 not distinctly pelagont, coxa 4 of medium size .........................................................................................Syrrhoites

— Mandibular palp absent, coxa 3 very pelagont, coxa 4 small .............................................................................................................Jeddo

5. Mandibular palp present, pleonites 1-3 multicrenulate dorsally .................................................................................................Tiron

— Mandibular palp absent, pleonites 1-3 each with 1 dorsal tooth .................................................................................................Metatiron
6. Gnathopodal palms transverse or nearly so, defined by enlarged spine(s) ................................................................. 7
   —Gnathopodal palms oblique and defined by enlarged spine(s) ........................................................................... 8
7. Coxae 3-4 pelagont ......................................................................................................................................................... Syrrhoe
   —Coxae 3-4 not pelagont ............................................................................................................................................. Garosyrrhoe
8. Mandibular molar of medium size, occasionally smooth and minutely fuzzy but usually triturative and generally columnar or subcolumnar, body of mandible stout but not extraordinarily bulky or subglobular, palp relatively strong ........................................................................................................ 9
   —Mandibular molar very large and smooth, minutely setulose or fuzzy, molar completely dominating mandible, body of mandible bulky, subglobular, together with molar often dwarfing palp (exceptions in Heraustroe and Jeddo) ................................................................. 10
9. Telson very long and narrow, entire ......................................................................................................................... Priscosyrrhoe
   —Telson of medium length, broad, cleft about halfway ......................................................................................... Austrosyrrhoe
10. Coxae 3-4 strongly pelagont .................................................................................................................................. 11
   —Coxae 3-4 not or weakly pelagont ......................................................................................................................... 13
11. Telson cleft three eighths or more, mandibular palp absent ................................................................................ Jeddo
   —Telson cleft one fourth or less, mandibular palp present ....................................................................................... 12
12. Antenna 1 with apicodorsal tooth on article 1, telson entire or apical cleft vestigial ........................................... Bruzeliospis
   —Antenna 1 lacking apicodorsal tooth on article 1, telson cleft about one fifth ..................................................... Heraustroe
13. Telson cleft one third or more .................................................................................................................................. 14
   —Telson entire ......................................................................................................................................................... 15
14. Palms of gnathopods bearing 1-2 serrate spines, coxa 1 narrow and tapering distally ........................................... Latacunga
   —Palms of gnathopods bearing 1-2 simple spines, coxa 1 not tapering ................................................................. Syrrhoites
15. Palms of gnathopods bearing 1-2 serrate spines .................................................................................................. Bruzelia
   —Palms of gnathopods bearing about 4 simple spines .................................................................................. Stephobruzelia

Austrosyrrhoe K.H. Barnard


Type species. Austrosyrrhoe crassipes K.H. Barnard, 1926, monotypy.

Diagnosis. Forehead not protuberant, lateral cephalic lobe not sharp; eyes absent; mandible with palp, molar of medium size and not dominating mandible,
weakly to strongly triturative; articles 1-2 of antenna 1 either basic or article 2 elongate and bearing apical tooth; coxa 1 ordinary; coxae 3-4 not pelagont or weakly so; gnathopods typically subchelate, palms oblique and bearing at least 1 serrate spine, occasionally gnathopod 2 with obsolete transverse palm; dactyl of gnathopod 2 usually normal; pereopods 3-5 elongate, dactyls elongate, article 2 of pereopod 7 weakly or strongly expanded, rounded or truncate ventrally; pleonites 1-3 not denticulate; uropod 3 not grossly exceeding uropods 1-2, peduncle elongate; telson of medium length and cleft halfway.

Variables. Article 2 of antenna 1 with apical tooth (type) or not (others), gnathopods with 1 palmar spine (type), or 2 (others); article 2 of pereopod 7 well expanded (A. septentrionalis) or poorly (type); and see subgeneric groups in 'Relationships'.

Taxonomy. Possibly species other than the type are not congeneric (see J.L. Barnard, 1972c).

Relationship. This genus remains confounded because of uncertainties in the type species (see J.L. Barnard, 1972c). Austrosyrroe remains a catchall of species with presumed unenlarged molar distinct from that of Ileraustroe and Bruzelia, bears a deeply cleft telson and oblique gnathopodal palms with one enlarged serrate spine. Species of Austrosyrroe and Priscosyrroe are of vital interest in attempting to determine whether the small mandibular molar is an evolutionary apex with origins in the Bruzelia group or whether the Austrosyrroe molar represents the condition primordial to the later evolution of the Syrrhoites-Bruzelia complex. The members of Austrosyrroe are the only species in Synopiidae with distinctly oblique palms that lie outside the Bruzelia complex; the Tiron group has simple gnathopods; the Syrrhoe group has transverse palms and Synopia is problematical.

Two groups of species occur in Austrosyrroe as diagrammed below. Some of the species now placed in Austrosyrroe were formerly in Syrrhoites. Because the precise shape of coxa 3 and armaments on uropods 1-2 are unknown in the type species, it seems unwise to divide the two groups generically; many more species of deep-sea synopiids undoubtedly remain to be described.

Diagnoses of Subgeneric Groups in Austrosyrroe. 1. Article 2 of antenna 1 bearing apical tooth; coxa 3 not adequately known; coxa 4 apparently large and adze-shaped; gnathopods with 1 palmar spine; outer rami of uropods 1-2 not definitely known though presumed from the description to have simple outer rami but much room for doubt is possible in light of other similarities to group 2....................... A. crassipes

2. Article 2 of antenna 1 simple; coxa 3 subquadrate and scarcely excavate posteriorly, coxa 4 medium and strongly adze-shaped; gnathopods with 2 palmar spines (male of A. fimbriatus aberrant and female not definitely known in this regard); outer rami of uropods 1-2 apically spinose ........................................ A. rinconis, septentrionalis, fimbriatus

Species. Austrosyrroe crassipes K.H. Barnard, 1926 (J.L. Barnard, 1972c) [701B]; A. fimbriatus (Stebbing & Robertson, 1891) (Schellenberg, 1925b) (Stephensen, 1938b) (Gurjanova, 1951) (Lincoln, 1979a) [239 + 202B]; A. rinconis J.L. Barnard, 1967a, 1972a [309B]; A. septentrionalis Stephensen, 1931a (Gurjanova, 1951) (J.L. Barnard, 1972c [216BA].

Habitat and distribution. Marine, probably cosmopolitan, mostly in deep water, 34-60 m in Irish Sea and Firth of Clyde, otherwise 885-2702 m, 4 species.

Bruzelia Boeck

Fig. 129E


Type species. Bruzelia typica Boeck, 1871b, monotypy.

Diagnosis. Forehead weakly protuberant in type but not in others, lateral cephalic lobe not sharp; eyes absent; mandible with palp, molar greatly enlarged, not triturative, fuzzy; mouthparts basic; articles 1-2 of antenna 1 basic; coxa 1 ordinary; coxae 3-4 not pelagont, coxa 3 not strongly expanded distally except for acute anteroventral cusp and not posteriorly excavate, coxa 4 variable, excavate posteriorly (rarely weak), and slightly smaller or slightly larger than coxa 3; gnathopods typically subchelate, palms oblique, defined by 1-2 serrate spines, second spine if present occasionally simple; dactyl of gnathopod 2 normal; pereopods 5-7 weakly to strongly elongate, dactyls weakly elongate, article 2 of pereopod 7 typically rounded posteroventrally but truncate in B. tuberculata and B. popolocan; pleonites 1-3 not denticulate; uropod 3 not exceeding uropods 1-2, peduncle typically short but elongate in B. tuberculata and B. popolocan; pleonites 1-3 not denticulate; uropod 3 not exceeding uropods 1-2, peduncle typically short but elongate in B. tuberculata and B. popolocan; telson elongate, entire.

Variables. Dorsal body teeth present or absent; antenna 1 with or without cusp; coxa 4 comma or adze-shaped; palm of gnathopods with 1 or 2 spines.

Relationship. Differing from Stephobruzelia in the 1-2 serrate spines of the gnathopodal palms (versus 4 simple spines). From Syrrhoites and Latacunga in the unleft telson.

Habitat and distribution. Marine, cosmopolitan deep or cold water, except 100 m in warm eastern Australia, otherwise cold 121-3716 m, 10 species.
Bruzeliopsis Chevreux

Fig. 130F

Bruzeliopsis Chevreux, 1911a: 3.-J.L. Barnard, 1972c: 32.

Type species. Bruzeliopsis alherti Chevreux, 1911a, original designation.

Diagnosis. Forehead not protuberant, lateral cephalic lobe not sharp; eyes absent; mandible with weak palp, molar greatly enlarged, not triturative, fuzzy; mouthparts basic; article 1 of antenna 1 elongate and bearing dorso (antero) distal tooth. Article 2 lacking tooth; coxa 1 ordinary; coxae 3-4 pelagont; gnathopods weakly subchelate, palms oblique, with 1-2 nonserrate defining spines; dactyl of gnathopod 2 normal; pereopods 5-7 elongate, dactyls elongate, article 2 of

Fig. 130. Synopiidae and Cardenioidae. A, Syrrhoites serratus; B, Tiron tropakis; C, Syrrhoe crenulata; D, Synopia scheeleana; E, Cardenio paurodactylus; F, Bruzeliopsis turba; G, Tiron spiniferum.
Brulard & Karaman: Marine Gammaridean Amphipoda

**Species.** See J.L. Barnard (1972c); *G. bigarra* (J.L. Barnard, 1962b, 1966a) [369]; *G. disjuncta* J.L. Barnard, 1969b [377]; species, Ortiz, 1978 [478].

**Habitat and distribution.** Marine, tropical pan-America, 0-89 m, 2 species.

*Ileraustroe* J.L. Barnard


**Type species.** *Austrosyrhoë ilergetes* J.L. Barnard, 1964, original designation.

**Diagnosis.** Forehead not protuberant; lateral cephalic lobe not sharp; mandible with palp, molar classified as enlarged but not strongly so, not triturative or weakly so, fuzzy; mouthparts basic; articles 1-2 of antenna 1 basic; coxa 1 ordinary; The affinities with *Bruzeliopsis* are very strong, coxae 3-4 not pelagont, coxa 3 softly rectangular, especially with *Bruzeliopsis* cuspidata which has a weak anterior margin nearly parallel with anterior, and apical cleft on the telson. The telson is highly elongate in typical species of *Bruzeliopsis* but not *B. turba*. The palp is nearly transverse, defined by large serrate spine giving propodus chelate appearance; dactyl of gnathopod 2 normal; pereopods 5-7 elongate, dactyls elongate, article 2 of pereopod 7 rounded posteriorly; pleonites 1-3 not denticulate or very weakly so; uropod 3 not exceeding uropods 1-2, peduncle elongate; telson highly elongate, cleft about one fifth its length.

**Relationship.** *Ileraustroe* differs from *Bruzelia* in the telsonic elongation, the slight cleft in the telson and the subpelagont coxae.

The affinities with *Bruzeliopsis* are very strong, especially with *Bruzeliopsis cupidata* which has a weak apical cleft on the telson. The telson is highly elongate in typical species of *Bruzeliopsis* but not *B. turba*. The type species of *Ileraustroe* and *Bruzeliopsis* have the truncate kind of article 2 on pereopod 7 but the bevelment is oblique in *Bruzeliopsis*. Other members of the two genera do not, however, share precisely similar pereopod 7 so that this characteristic is not highly valuable generically.

*Bruzeliopsis* has fully pelagont coxae and article 1 of antennal is elongate and bears an anterodistal tooth. The gnathopods of *Bruzeliopsis* are nearly simple like those in *Jeddo* but they do bear two simple defining spines whereas the gnathopods of *Ileraustroe* are fully subchelate and bear at least one serrate spine. The molars of *Bruzeliopsis* are also fully enlarged.


**Habitat and distribution.** Marine, Mediterranean,
South Atlantic, eastern Pacific, 1363-5690 m, 2 species.

_Jeddo_ J.L. Barnard


**Type species.** *Jeddo simplisyrrhis* J.L. Barnard, 1962d, original designation.

**Diagnosis.** Forehead not protuberant, lateral cephalic lobe not sharp; eyes absent; mandible lacking palp, molar greatly enlarged, not triturative, fuzzy; mouthparts basic; articles 1-2 of antenna 1 basic; coxa 1 ordinary; coxae 3-4 pelagont; gnathopods simple, lacking distinctive spines; dactyl of gnathopod 2 normal; pereopods 5-7 elongate, dactyls elongate, article 2 of pereopod 7 rounded posterovertrally; pleonites 1-3 not denticulate; uropod 3 not exceeding uropods 1-2, peduncle elongate; telson elongate and cleft.

**Relationship.** Differing from _Bruzeliopsis_ and _Ileraustroe_ in the deeply cleft telson and loss of mandibular palp.

**Species.** *Jeddo simplisyrrhis* J.L. Barnard, 1962d, 1972c [701B].

**Habitat and distribution.** Marine, Cape Basin, South Africa, 1861 m, 1 species.

_Latacunga_ J.L. Barnard

_Latacunga_ J.L. Barnard, 1972c: 35.

**Type species.** *Latacunga latacunga* J.L. Barnard, 1972c, original designation.

**Diagnosis.** Forehead not protuberant, lateral cephalic lobe not sharp; eyes well developed, or absent, often with pair of segregated lateral corneal lenses on each side of head; mandible without palp, molar large, columnar, triturative; mouthparts basic; articles 1-2 of antenna 1 basic; coxa 1 ordinary, coxae 3-4 pelagont, coxa 3 oblong, weakly expanded apically, poorly excavate, coxa 4 small; gnathopods simple, propodus thin, spinose; dactyl of gnathopod 2 normal; pereopods 5-7 short, dactyls short, clawlike, bearing large inner wire-seta; article 2 of pereopod 7 posterovertrally rounded; pleonites 1-3 with mid-dorsal tooth; uropod 2 [not shortened]; uropod 3 [exceeding uropods 1-2, peduncle short]; telson elongate, deeply cleft.

**Relationship.** Differing from _Tiron_ in the presence of single dorsal teeth on pleonites 1-3, the absence of the mandibular palp, and the heavy spines on the propodus of the gnathopods. From _Pseudotiron_ in the slightly sharper rostrum and unshortened uropod 1, unserrate (only one tooth) pleonites 1-3, less strongly curved coxa 4, and spinose propodus of the gnathopods.

**Species.** *Metatiron brevidactylus* (Pillai, 1957) (Ledoyer, 1979a, 1986) [690]; *M. caecus* Ledoyer, 1979a, 1986 [698].

**Habitat and distribution.** Marine, India to Madagascar, 9-27 m, 2 species.

_Priscosyrrhoe_ J.L. Barnard

_Priscosyrrhoe_ J.L. Barnard, 1972c: 44.

**Type species.** *Astrosyrrhoe priscis* J.L. Barnard, 1967a, original designation.

**Diagnosis.** Forehead weakly protuberant, lateral cephalic lobe not sharp; eyes absent; mandible with
polp, molar small and not dominating mandible, triturative surface obsolete; article 2 of antenna 1 elongate and bearing apico-dorsal tooth; coxa 1 ordinary; coxae 3-4 weakly pelagont; gnathopods typically subchelate, palms oblique and bearing one large serrate spine; dactyl of gnathopod 2 normal; pereopods 5-7 elongate, article 2 of pereopod 7 weakly expanded and ventrally rounded; pleonites 1-3 not denticulate; uropod 3 not exceeding uropods 1-2, peduncle elongate; telson highly elongate, entire.

**Relationship.** Differing from *Austrosyrrhoe* in the very long, narrow and unclut telson. From the *Jeddo-Bruzeliois-Brucelia* group of genera in the ordinary triturative molar and non-hulky size of mandible.

**Species.** *Priscosyrrhoe prisca* J.L. Barnard, 1972c.

**Habitat and distribution.** Marine, Baja California, Cedros Trench, 842-1720 m, 1 species.

**Pseudotiron** Chevreux

![Fig.129B](image)


**Type species.** *Pseudotiron bouvieri* Chevreux, 1895b, original designation.

**Diagnosis.** Forehead protuberant, lateral cephalic lobe sharp or weakly so; eyes absent; mandible with palp, molar of medium size, columnar and triturative; mouthparts basic; articles 1-2 of antenna 1 basic; coxa 1 ordinary; coxae 3-4 pelagont or weakly so or not pelagont in *P. coas*, gnathopods simple, lacking distinctive spines; dactyl of gnathopod 2 normal; pereopods 5-7 typically elongate but short in *P. coas*, article 2 of pereopod 7 typically rounded posterovertrally but truncate in *P. longicaudatus*; pleonites 1-3 typically denticulate dorsally but apparently smooth in *P. golens*; uropod 3 greatly exceeding apex of uropods 1-2, peduncle short; telson elongate, deeply cleft. Pleonite 6 elongate.

**Variables.** Coxa 3 small, rectangular, poorly excavate (*P. coas*), large, trapezoidal, well excavate (*P. bouvieri*, etc.); dactyls of pereopods 6-7 elongate (*P. longicaudatus*), short (others); uropod 1 shortened (*P. golens*).

**Relationship.** Differing from *Tiron* in the shortened uropod 1, lack of eyes and blunter rostrum. From *Synopia* in the elongate telson and longer peduncle of uropod 1, other than *Metatiron* (see) and *Tiron* by the simple gnathopods.

See *Metatiron*.

**Stephobruzelia** J.L. Barnard


**Type species.** *Bruzelia dentata* Stephensen, 1931a, original designation.

**Diagnosis.** Forehead not protuberant, lateral cephalic lobe sharp or weakly so; eyes absent; mandible with palp, molar greatly enlarged, not triturative, fuzzy; mouthparts basic, articles 1-2 of antenna 1 basic; coxa 1 ordinary; coxae 3-4 not pelagont, coxa 3 rectangular, not distally expanded except for anteroventral cusp, posterior margin parallel with anterior and not excavate, coxa 4 as long as and as large as coxa 3, subrectangular, posterovertrally excavate but ventral margin truncate, with midposterior tooth; gnathopods typically subchelate, palms oblique, defined by about 4 simple spines; dactyl of gnathopod 2 normal; pereopods 5-7 elongate, dactyls elongate, article 2 of pereopod 7 rounded posterovertrally; pleonites 1-3 not denticulate; uropod 3 not exceeding uropods 1-2, peduncle elongate; telson elongate, entire.

**Relationship.** See *Bruzelia*.

**Species.** *Stephobruzelia dentata* (Stephensen, 1931a) (Gurjanova, 1951) (J.L. Barnard, 1972c) [209B].

**Habitat and distribution.** Marine, Norwegian Basin, 1096-1996 m, 1 species.

**Synopia** Dana

![Figs 129D, 130D](image)


**Type species.** *Synopia ultramarina* Dana, 1853, selected by J.L. Barnard, 1969.

**Removal.** *Pseudotiron brevidactylus* Pillai, 1957, to *Metatiron*.
Diagnosis. Forehead protuberant, lateral cephalic lobe not sharp; eyes present, accessory eyes present; articles 1-2 of antenna 1 basic; mandible with palp, molar large, columnar, triturative (type) or swollen and pillowylike and poorly triturative (S. variabilis); mouthparts, especially maxillipeds, subfoliaceous; inner plate of maxilliped lacking large smooth spine, outer plate only with medial setae; coxa 1 ordinary (if small, not tapering), coxae 3-4 pelagont; gnathopods simple, propodus slender or timid, often heavily setose but lacking defining spines, rudiment propodus appearing subchelate; dactyl of gnathopod 2 vestigial or very small; pereopods 5-7 elongate, dactyls elongate, article 2 of pereopod 7 weakly basic or tending towards truncation or gross lobation; pleonites 1-3 not denticulate; uropod 3 greatly exceeding apices of uropods 1-2, peduncle short; telson short, cleft, or entire and trifoliate.

Variables. Forehead protuberant or not; article 2 of pereopod 7 narrow or broad, rectangular or ovate; telson elongate or short, entire or cleft.

Taxonomy. Very poorly described genus; several species to be clarified; distributions poorly specified.

Relationship. Distinguished by the short telson, short peduncle of uropod 3 and extremely stout mandibular palp.

Species. See J.L. Barnard (1972c); S. angustifrons Dana, 1853 (Boeck, 1876) (Stebbing, 1906) [532N]; S. carabica Bovallius, 1886 (Stebbing, 1906) [460N]; S. gracilis Dana, 1853 (Boeck, 1876) (Spandl, 1984); S. orientalis Kossmann, 1880 (Boeck, 1876) (Stebbing, 1906) [677]; S. rotunda Andres, 1976 (Boeck, 1876) [400N]; S. scheleleana Bovallius, 1886 (Stebbing, 1906) (Chilton, 1979a) [400 + 530]; S. triangularis Andres, 1984b [408N]; S. ultramarina Dana, 1853 (Boeck, 1876) (Spandl, 1924a) (Schellenberg, 1926a) (Shoemaker, 1945a) (Ortiz, 1978) (Ledoyer, 1979a) [400 + 500 + 600 + NJ]; S. variabilis Spandl, 1923f (Spandl, 1924a) (J.L. Barnard, 1965a) (Ledoyer, 1979a) [600N].

Habitat and distribution. Marine, cosmopolitan, mostly epipelagic, neritic, poorly reported, 9 species.

Syrhoo Goes

Figs 129C, 130C


Type species. Syrhhoe crenulata Goes, 1866, selected by Boeck, 1876.

Diagnosis. Forehead in type species not protuberant but strongly so in 3 other species, lateral cephalic lobe sharp in type but rounded in species with protuberant forehead and others; eyes typically present but occasionally absent, accessory eyes absent; mandible with palp, molar small, weakly triturative; mouthparts basic; articles 1-2 of antenna 1 usually basic but in type article 1 bearing large posteroventral tooth and article 2 in S. papyracea with weak tooth, peduncle slightly elongate (female); coxa 1 ordinary; coxae 3-4 pelagont; gnathopods with transverse or subtransverse palms bearing enlarged serrate defining spine giving chelate appearance to propodus, spine possibly unserrate in S. affinis; dactyl of gnathopod 2 normal; pereopods 5-7 elongate, dactyls elongate, second articles heavily serrate or not, article 2 of pereopod 7 typically rounded posteroventrally but in few other species becoming truncate; pleonites 1-3 typically denticulate dorsally but often smooth or bearing single dorsal tooth, uropod 3 not exceeding apices of uropods 1-2 (possible exception in S. longifrons group), peduncle short (except S. nodulosa); telson elongate, deeply cleft.

Variables. Forehead protruding or not; coxa 1 expanded or not, coxa 2 narrowed or not; pleonal teeth and serrations distinctive; telsonic length and cleft variable.

Relationship. Differing from Garosyrhoo in the pelagont coxae.

Otherwise distinguished from other genera by combination of elongate telson, and subchelate gnathopods with transverse palms.


Habitat and distribution. Marine, cosmopolitan, cool to cold water, probably somewhat demersal, 40-3251 m, 11 species.

Syrhooites Sars

Figs 129F, 130A

Type species. *Bruzelia serrata* Sars, 1879, original designation.

**Diagnosis.** Forehead not protuberant, lateral cephalic lobe not sharp; eyes absent; mandible with palp, molar greatly enlarged, not triturative, fuzzy; articles 1-2 of antenna 1 basic, article 1 with small mediosternal tooth; coxa 1 ordinary; coxa 3 rectangular, not distally expanded, posterior margin parallel, with anterior margin and not excavate, coxa 4 nearly as long as 3, with subequal surface area, adze-shaped, thus coxae 3-4 occasionally weakly pelagont; gnathopods typically subchelate, but palms very oblique, however defined by 1-2 unserrate spines but majority of species with palms obsolescent though distinguished by spine(s); dactyl of gnathopod 2 normal; pereopods 5-7 elongate, dactyls elongate, article 2 of pereopod 7 typically basic but posteroventrally truncate in *S. cohasseta-redox* group; pleonites 1-3 not denticate; uropod 3 not exceeding other uropods (or rarely in slight degree), peduncle elongate; telson elongate and deeply cleft.

**Variables.** Rostrum long to medium, deflexed or nearly horizontal; dorsal teeth and epimeral shapes variable; coxa 4 shortened (*S. capricornia*); uropod 1 short (*S. pusillus*); uropods 1-2 with or without distolateral tooth on peduncle; cleft of telson variable.

**Relationship.** Differing from *Bruzelia* and *Astrostyrrhoe* in the unctelf telson. From *Bruzelioptis* in the nonpelagont coxae. See *Latacunga*.


**Habitat and distribution.** Marine, cosmopolitan, temperate and coldwater, 70-4086 m, 20 species.
Habitat and distribution. Marine, cosmopolitan, generally warm to cold shallow water, species mostly oculate, 3-682 m, 10 species.

TALITRIDAE Rafinesque, 1815
Not Treated Herein
Figs 70C, 71B,C,D

Beach and forest hoppers, not considered herein but see Talitroidea for endpoint in the key. A few figures are included for comparisons with hyalids and najnids.

Diagnosis. Accessory flagellum absent; mandible lacking palp; coxa 1 ordinary; uropod 3 essentially uniramous but 1 genus (Parhyale) with tiny scale-like inner ramus.

See Colomastigidae, Corophioidea and Tulearidae.

Relationship. Differing from Corophioidea in the absence of spinning glands in the pereopods and from those with poorly developed uropod 3 in the well-developed coxae. From Tulearidae in the lack of a huge lobe on coxa 4. From Colomastigidae in the strong inner plates of the maxillips, well-developed flagella of the antennae and the non-probe-like gnathopod 1.

Key to Families of Talitroidea

1. Mandibular molar fully triturative ................................................................. 2
   — Mandibular molar not fully triturative ..................................................... 7

2. Peduncle of antenna 2 heavily setose, pereopods 5-7 subfossorial, heavily setose and spinose ............................................................... Dogielinotidae
   — Peduncle of antenna 2 not heavily setose, pereopods 5-7 not heavily setose and spinose ................................................................. 3

3. Urosomites coalesced .................................................................................. Kuriidae
   — Urosomites separate ................................................................................ 4

4. Uropod 3 lacking ramus ............................................................................. Ceinidae (including Chiltoniinae)
   — Uropod 3 with ramus ............................................................................... 5

5. Antenna 1 much shorter than peduncle of antenna 2, dactyl of maxillipedal palp vestigial or absent, area of coxa 1 much smaller than coxa 2, gnathopod 2 in female and juveniles with mitten-shaped and minutely chelate propodus ........................................ Talitridae
   — Antenna 1 as long as or longer than peduncle of antenna 2, dactyl of maxillipedal palp unguiform, area of coxa 1 subequal to that of coxa 2, gnathopod 2 in female and juveniles regularly subchelate ......................................................... 6

6. Telson cleft ................................................................................................. Hyalidae
   — Telson entire ........................................................................................... Hyalellidae

7. Mandibular molar represented by articulate spine(s) ................................ Najnidae
   — Mandibular molar represented by fixed process or absent ....................... 8
8. Body strongly cylindroid, coxae small, subovate, not splayed; telson cleft; abdomen unflexed; uropod 3 very small, hidden from lateral view, tucked mostly below telson............................Eophliantidae

—Body strongly compressed laterally, coxae medium to large, not splayed, telson weakly cleft in marine species, entire in freshwater species, abdomen unflexed, uropod 3 small but visible from lateral view.................................9

—Body strongly depressed, coxae variable, splayed, telson entire, abdomen strongly flexed beneath thorax, uropod 3 very small, hidden from lateral view, tucked beneath telson (all marine)..........................................................10

9. Pereon with pleurae ...........................................................................Temnophliantidae

—Pereon lacking pleurae ..................................................................Phliantidae

10. Head depressed, cuspidate, body with strong anterodorsal cuspidation, coxae excavate, cuspidate, antennae cuspidate, gnathopods lacking large thick setae ...........................................................................Plioplateidae

—Head not depressed, not cuspidate, body with weak or no anterodorsal cuspidation, coxae neither excavate nor cuspidate, antennae not cuspidate, gnathopods with large thick setae...........................................................................Ceinidae

**TEMNOPHLIANTIDAE** Griffiths, 1975


See page 280 for note on proper spelling of family name.

**Diagnosis.** Head slightly reduced in size; basal fusion of antenna 2 [unknown (but probably fused)]; antennal fusion probable (pleonites 4-5 'not distinctly separate' for Hystriphlias), pleon small and flexed below body; thorax depressed, very broad and flat or triquetral, segments laterally discontinuous and produced into pleurae, coxae, though small, therefore splayed. Eyes small, ommatidial. Antennae short. Accessory flagellum absent. Mandible lacking palp, molar degraded, styliform; maxillae feeble. Gnathopods simple. Peduncles of pleopods expanded. Uropods 1-2 with 1 ramus, uropod 3 without ramus. Telson entire, laminar or appearing weakly fleshy, pinniform.

See Phliantidae, Eophliantidae, Plioplateidae, and key to Talitroidea.


**Relationship.** Differing from Phliantidae, Eophliantidae, and Plioplateidae in the presence of pereonal pleurae. Similarity in body form between Hystriphlias and Plioplateidae suggesting descent through common ancestor.

**Key to Genera of Temnophliantidae**

1. Body flat, lacking dorsal processes, coxae simple, all thoracic legs simple ...........................................................................Temnophlias

—Body triquetral, with dorsal processes, coxae bifid or trifid, all thoracic legs prehensile ...........................................................................Hystriphlias
**Hystriphlias** Barnard & Karaman

*Fig. 131B*


**Type species.** *Temnophlias hystrix* K.H. Barnard, 1954, original designation.

**Diagnosis.** Body triquetral, with dorsal processes, coxae bifid or trifid, all thoracic legs prehensile.

**Species.** *Hystriphlias hystrix* (K.H. Barnard, 1954) (Griffiths, 1975) [743].

**Habitat and distribution.** Marine, South Africa, littoral, 1 species.

*Temnophlias* K.H. Barnard

*Fig. 131A*


**Type species.** *Temnophlias capensis* K.H. Barnard, 1916, monotypy.

**Diagnosis.** Body flat, lacking dorsal processes, coxae simple, all thoracic legs simple.

**Species.** *Temnophlias capensis* K.H. Barnard, 1916, 1954 (Griffiths, 1975) [743].

**Habitat and distribution.** Marine, South Africa, littoral, 1 species.

**TULEARIDAE** Ledoyer, 1979a

**Diagnosis.** Body compressed, with appearance of stenothoid or cyproidinid. Head more or less ordinary but hooded, eyes ordinary. Accessory flagellum absent. Mandibular shape not styloform, molar and palp absent; outer plates of maxillipeds large (versus Stenothoidae). Coxae 1-3 large, ordinary (versus Stenothoidae, Nihotungidae); coxa 4 shield-like but posterodorsally excavate, as wide as length of 4 pereonites; coxae 5-7 small. Gnathopods feeble, weakly subchelate. Urosomites separate. Uropod 3 uniramous, ramus 1-articulate. Telson of ordinary length, weakly cleft.

See Stenothoidae, Cressidae, Nihotungidae, Pagetinidae, Sebidae, Amphilochidae and Anamixidae.

**Description.** Body compressed, smooth. Head large, strongly rostrate or hooded; eyes ordinary. Antennae short, feeble, antenna 1 stouter than 2, peduncle short, accessory flagellum absent, primary flagellum not longer than peduncle; flagellum of antenna 2 about 2 to 3-articulate, very short.

Labrum weakly excavate below. Incisor broad,
toothed, lacinia mobilis present, 1 raker present, molar and palp absent. Labium with appressed major lobes and well-developed rounded mandibular lobes, inner lobes plastered to outer lobes. Inner plate of maxilla 1 (unknown), outer plate with 6 spines, palp vestigial. Lobes of maxilla 2 fused together to make vermiform appendage. Maxillipeds large, inner plates, ordinary, outer plates very large, medially excavate and weakly spinose, palp stout, dactyl unguiform, very large and thick.

Coxae 1-3 large, longer than broad, rounded or truncate apically. Gnathopods feeble, alike, gnathopod 2 slightly longer than 1, carpi of medium length or weakly elongate, unilobate, propodi thin, rectangular, palms short, oblique, dactyls ordinary. Article 2 of pereopods 5-6 unexpanded, of pereopod 7 broadly expanded and lobate. Uropods 1-2 weakly spinose, outer rami slightly shortened. Peduncle of uropod 3 of medium length, ramus slightly longer than peduncle, with weak apical spine. Telson of ordinary length, cleft about one third its length.

Relationship. Superficially similar to Stenothoidae and Cressidac but coxa 1 large, outer plates of maxillipeds large, ramus of uropod 3 1-articulate.

Differing from Nihotutla in the large coxae 2-3, large rostrum, undivided eyes, loss of mandibular palp and uncomplicated maxilla 1. From Pagetinae in the loss of mandibular palp, large outer plates of the maxillipeds and large coxae. From Sebidae in the nonchelate gnathopods, huge coxa 4 and very large outer plate of the maxillipeds. From Dexamini, Amphilochoidea, Anamixidae, Leucothoidae, and Stilipedidae in the uniramous uropod 3. From Ceinidae in the huge coxa 4, rectilinear article 2 of pereopods 5-6 and the presence of a ramus on uropod 3.

Tulearus Ledoyer

Tulearus Ledoyer, 1979a: 139.

Fig.132. Tulearidae. Tulearus thomossini. Two different specimens.
Type species. *Tulearus thomassini* Ledoyer, 1979a, original designation.

Diagnosis. With the characters of the family.


Habitat and distribution. Marine, Madagascar, 12-31 m, 1 species.

**TYPHLOGAMMARIDAE** Bousfield, 1977
[see Barnard & Barnard, 1983]

**UROHAUSTORIIDAE** Barnard & Drummond, 1982c

Diagnosis. Rostrum weak, head short, cheek poorly developed. Antenna 1 of haustorius form, article 1 short, articles 2-3 progressively shorter, weakly geniculate or not, flagella elongate, usually subequal to peduncle. Antenna 2 of haustorius form, article 4 expanded, with facial spines near base, article 5 shorter and narrower than article 4, these articles furnished with 1 or more longitudinal rows of armaments, ventral margin of article 4 with at least 3 kinds of setae: (1) elongate plumes, (2) shorter and stiffer glassy spines set in clusters or ranks, and (3) usually bulbular-based penicillate setules; flagellum subequal to or longer than article 4 of peduncle. Prebuccal complex massive, upper lip usually dominant and epistome scarcely distinct. Mandibles bearing elongate, poorly toothed incisors; laciniae mobiles present on each side, diverse; rakers distinct, usually serrate, but few in number; molar large and weakly triturative, usually furnished with accessory chopper; palp 3-articulate, article 3 with numerous outer and inner setae forming apical fan, apex not bevelled, most setae awned. Lower lip with discrete inner lobes, mandibular extensions of outer lobes well developed. Maxilla 1 with 1-articulate palp (except *Huarpes*), inner plate with fewer than 5 setae. Maxilla 2 ordinary, inner plate with oblique but poorly developed facial row of setae. Maxillipeds with unexpanded bases, normally enlarged plates, outer spinose; palp 4-articulate, article 2 expanded, article 4 clavate, multisetose. Maxillae and maxillipeds lacking blear lobes.

Coxa 2 very small, not forming stepped intergrade between coxae 1 and 3; coxa 3 dominant or not dominated by coxa 4, broadly extended posteroventrally. Coxal gills on segments 2-5. Brood plates slender. Gnathopods feeble, grossly alike in proportions, carpi elongate, but gnathopod 1 simple, gnathopod 2 subchelate or minutely parachelate; article 3 short. Article 5 of pereopods 3-4 broad, slightly expanded, not deeply lobate, with thick posterior spines; dactyls of pereopods 3-5 well developed, those of pereopods 6-7 variable; pereopod 5 of haustorius form, articles 2, 4, and 5 expanded, articles 5 and 6 with extensive facial rows of spines; pereopods 6-7 alike, articles 5-6 weakly expanded; no pereopod with underslung articulation.

Pleon 2 usually inferior in size, number of articles or setation; peduncles of pleopods not longer than wide, coupling hooks paired; inner ramus inferior, each usually bearing 1 clothespin spine. Epimeron 1 scarcely developed; epimeron 2 dominant in setation, often dominant in size. Urosomites ordinary, though often furnished with lateral teeth. Rami of uropods 1-2 linguiform, setose (not spinose); uropod 3 of ordinary haustorioid-phoxocephalid kind, outer ramus dominant, 2-articulate, peduncle short, flat, expanded, rami poorly setose apically, telson variable.

See key to Haustoriidea.

**Sexual dimorphism.** Weak.

**Relationship.** This family differs from the Urothoridae in the almost full loss of the cephalic cheek, the full development of the haustorius antenna 2, and in the dominance of epimeron 2. All taxa have linguiform and setose rami on uropods 1-2 whereas urothoids have stiltyform and spinose rami. The urothroid *Cunicus* upsets easy recognition and clear distinction between the two groups because the rami of uropods 1-2 are absent and the peduncles are linguiform and setose.

Distinguishing characters of Haustoriidae are listed with the diagnosis of that family.

Phoxocephalopsidae bear stiltyform or rod-shaped spinose rami on uropods 1-2.

Urohaustoriidae differ from Zobrachoidae exclusively in the almost full loss of epimeron 1; in the simple gnathopod 1; the great reduction in size of coxa 2 (and, in all but one case, of coxa 1); to a lesser degree the uniformly small rostrum or simple outline dorsally of the head; the small number of setae on the palp of maxilla 1; reduction in the extension and cuspation of the mandibular molar; and generally the reduction in size of article 2 on the outer rami of uropod 3.

*Prantinus* of the Zobrachoidae intergrades some of these characters slightly. Epimeron 1, for example, is not as well developed as in other zobrachoids; article 2 on the outer rami of uropod 3 is not as greatly elongate; but on the other hand the mandibular molar is extremely cuspate and the head is strongly rostrate or, at least, extended forward dorsally.

**Ecology.** Urohaustoriids live as fossorialis in shallow water on sandy to muddy benthos and often in the surf zone. See Dexter (1983a, 1983b, 1985a) for life histories.
Key to Genera of Urohaustoriidae

1. Dactyl of pereopod 5 spinose ................................................................. 2
   — Dactyl of pereopod 5 not spinose ..................................................... 4

2. Antennae bearing supernumerary oar-shaped setae, article 2 of pereopods 6-7 narrow or strongly tapering distally ........................................... Narumius
   — Antennae lacking supernumerary oar-shaped setae, article 2 of pereopods 6-7 fully expanded, not tapering distally .............................................. 3

3. Coxa 3 large, coxa 4 small ................................................................. Urohaustorius
   — Coxa 3 small, coxa 4 large .............................................................. Gheegerus

4. Posterior margin of coxa 3 not excavate, (right and left laciniae mobiles subequal), coxa 2 larger than coxa 1, mandibular lobes of lower lip blunt ................................................................. Huarpe
   — Posterior margin of coxa 3 excavate, (right and left laciniae mobiles various), coxa 2 not larger than coxa 1, mandibular lobes of lower lip not blunt ................................................................. 5

5. Epimera 2-3 lacking setae (and identical) ............................................ 6
   — One or the other of epimera 2-3 setose, not identical ................................................................. 7

6. Coxae 1 and 2 of equal size, right and left laciniae mobiles of subequal size, thin ................................................................. Dirimus
   — Coxa 1 larger than coxa 2, left lacinia mobilis much broader than right ................................................................. Warragaia

7. Gnathopod 2 subchelate, dactyls of pereopods 5-7 setose in female ........................................................................ Tottungus
   — Gnathopod 2 parachelate, dactyls of pereopods 5-7 not setose in female ........................................................................ Tuldarus

**Dirimus** Barnard & Drummond

*Dirimus* Barnard & Drummond, 1982c: 132.

_Type species.* Dirimus taritus Barnard & Drummond, 1982c, original designation.


_Additional characters.* Head cowl-like; combs of gnathopod 2 absent; inner rami of uropods 1-2 reduced.

_Relationship.* Differing from *Tottungus* in size equality of epimera 2-3, shape and lack of setation (thus unlike all other urohaustoriids), ordinary palp setation of maxilla 1 and uropod 3 (see *Tottungus* ‘Additional characters’), chelate gnathopod 2 and equality of coxae 1-2.

*Dirimus* thus with many plesiomorphic characters (see Barnard & Drummond, 1982c) but apomorphically with reduced rakers and reduced inner rami of uropods 1-2.

See *Warragaia*.

_Species.* Dirimus taritus Barnard & Drummond, 1982c [631].

_Habitat and distribution.* Marine, Queensland, Moreton Bay, 2-12 m, 1 species.
**Gheegerus** Barnard & Drummond

*Gheegerus* Barnard & Drummond, 1982c: 106.

**Type species.** *Gheegerus garbaius* Barnard & Drummond, 1982c, original designation.

**Diagnosis.** Antennae lacking oar-shaped setae. Laciniae mobiles strongly asymmetrical. Coxae 1-2 small, subequal; coxa 3 much larger than coxae 1-2 but smaller than coxa 4, adze-shaped, posterior margin oblique but scarcely excavate; coxa 4 large, shield-shaped. Gnathopod 2 parachelate. Dactyl of pereopod 5 spinose. Article 2 of pereopods 6-7 expanded. Epimeron 3 dominant; epimeron 2 setose.

**Additional characters.** Palpal setae of maxilla 1 in 2 sets; basoventral setae on outer rami of uropods 1-2 absent (versus *Bumeralius*).

**Relationship.** Differing from *Urohaustorius* in the small coxa 3 and large coxa 4. From *Bumeralius* in the spinose dactyl of pereopod 5 and lack of basoventral setae on the outer rami of uropods 1-2. From *Narunius* in lack of oar-shaped setae on antennae 1-2 and narrow article 2 of pereopods 6-7.

**Species.** *Gheegerus garbaius* Barnard & Drummond, 1982c [631].

**Habitat and distribution.** Marine, Queensland, Moreton Bay, 6.7 m, 1 species.

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**Huarpe** Barnard & Clark


**Type species.** *Huarpe escofeti* Barnard & Clark, 1982a, original designation.

**Diagnosis.** Antennae lacking oar-shaped setae. Laciniae mobiles strongly asymmetrical. *Palp of maxilla 1 2-articulate.* Coxae 1,2,3,4 progressively larger, posterior margin of coxa 3 not excavate. Gnathopod 2 parachelate. Dactyl of pereopod 5 not spinose. Article 2 of pereopods 6-7 expanded broadly. Epimeron 3 dominant in size; epimeron 2 strongly setose.

**Additional characters.** Mandibular lobes of lower lip abnormally reduced (but larger than in Haustoriidae); article 1 of antenna 1 with large crescent of setae; inner plate of maxilla 2 with facial row of setae; dactyls of pereopods 6-7 especially small (but see *Urohaustorius perkesii*); telson deeply cleft (all characters like Zobrachioidea).

**Relationship.** Differing from other urohaustoriids in the evenly enlarging coxae 1-4 and the items in 'Additional characters'. From Zobrachioidea in reduced mandibular lobes of lower lip, 2-articulate palp of maxilla 1, weak rostrum, short incisor, sparse rakers, poorly developed laciniae mobiles and poorly developed epimeron 1.

**Species.** *Huarpe escofeti* Barnard & Clark, 1982a [864].

**Habitat and distribution.** Marine, Argentina, ?Golfo San Jose to Magellan Straits, Chile, 0-12 m, 1 species.

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**Narunius** Barnard & Drummond

Fig.67C

*Narunius* Barnard & Drummond, 1982c: 111.

**Type species.** *Narunius tallerkus* Barnard & Drummond, 1982c, original designation.

**Diagnosis.** Antennae with oar-shaped setae. Laciniae mobiles strongly asymmetrical. Coxae 1-2 small and subequal, coxa 3 huge, adze-shaped, posteriorly excavate, coxa 4 about same size, subquadrate. Gnathopod 2 parachelate. Dactyl of pereopod 5 spinose. Articles 2 of pereopods 6-7 slender, subrectangular or trapezoidal. Epimeron 3 slightly dominant, epimeron 2 setose.

**Additional character.** Article 5 of pereopods 3-4 with weak secondary spination (versus *Urohaustorius*).  

**Relationship.** Differing from *Urohaustorius* in subequal coxae 3 and 4, narrow article 2 of pereopods 6-7 and see 'Additional character'.

**Species.** *Narunius tallerkus* Barnard & Drummond, 1982c [784+].

**Habitat and distribution.** Marine, Victoria to Queensland, 3-22 m, 1 species.

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**Tottungus** Barnard & Drummond

*Tottungus* Barnard & Drummond, 1982c: 126.

**Type species.** *Tottungus tungus* Barnard & Drummond 1982c, original designation.

**Diagnosis.** Antennae lacking oar-shaped setae. Laciniae mobiles strongly asymmetrical. Coxae 1-2 small but coxa 1 larger than coxa 2; coxa 3-4 huge, subequal, weakly sickle-shaped but thick, posterior margins...

Additional characters. Head cowl-like; setae of coxae 3-4 especially small; article 5 of pereopods 6-4 with extra set of facial setae; inner rami of uropods 1-2 absent (fused as processes to podonules); outer ramus of uropod 3 with 3 apical setae (versus 2 in Tulparus).

Relationship. Differing from Tulparus in loss of chela on gnathopod 2 and see 'Additional characters'.

Species. Tottungus tungus Barnard & Drummond, 1982c [782].

Habitat and distribution. Marine, Victoria, 2-23 m, 1 species.

**Tulparus** Barnard & Drummond  
Figs 66K, 68E  
Tulparus Barnard & Drummond, 1982c: 118.

Type species. Tulparus cangellus Barnard & Drummond, 1983c, original designation.

Diagnosis. Antennae lacking oar-shaped setae. Lacinae mobiles strongly asymmetrical. Coxae 1-2 small and subequal (or moderately diverge). Coxae 3-4 both large, similar, sharply sickle-shaped, posterior margins excavate. Gnathopod 2 parachelate. Dactyl of pereopod 5 not spinose. Article 2 of pereopods 6-7 narrow or expanded. Epimeron 3 scarcely larger than 2; epimeron 2 setose. All setae on palp of maxilla 1 fully apical (versus Urohaustorius).

Variables. Article 2 of pereopods 6-7 narrow (type) or expanded; inner ramus of uropods 1-2 present (type) or absent.

Relationship. Differing from Urohaustorius in lack of spinose on dactyl of pereopod 5, in loss of dominance of coxa 3 and see 'Additional characters'. From Narunius in lack of oar-shaped setae on antennae 1-2 and simple dactyl of pereopod 5.

Species. Tulparus barinius Barnard & Drummond, 1982c [782]; T. cangellus Barnard & Drummond, 1982c [784].

Habitat and distribution. Marine, Victoria and New South Wales, 9-28 m, 2 species.

**Urohaustorius** Sheard  
Figs 65E-I, 66L,M, 67E, 68I, 69I  

Type species. Urohaustorius haelt Sheard, 1936, original designation.

Diagnosis. Antennae lacking oar-shaped setae. Lacinae mobiles strongly asymmetrical. Coxae 1-2 small and subequal (or moderately diverge), coxa 3 huge and posteriorly excavate, coxa 4 smaller and of medium size. Gnathopod 2 parachelate. Dactyl of pereopod 5 spinose. Article 2 of pereopods 6-7 expanded broadly. Epimeron 3 weakly dominant or not; epimeron 2 setose.

Variables. Coxa 1 much larger than coxa 2 and forming hook (U. gunni); dactyls of pereopods 6-7 vestigial (U. perkei); inner ramus of uropods 1-2 long or short (never vestigial);elson weakly cleft or entire.

Relationship. The typical genus to which other genera are compared.


Habitat and distribution. Marine, southern Australia, from South Australia to southern Queensland, often in seaside saline lakes and estuaries, open sea shallows from surf zone to 0 m, 124 species.

**Warragana** Berents  
Warragana Berents, 1983: 283.

Type species. Warragana tintinnah Berents, 1985, original designation.

Diagnosis. Antennae lacking oar-shaped setae. Lacinae mobiles asymmetrical. Coxae 1-2 small, but coxa 1 larger than coxa 2; coxae 3-4 both large, dissimilar, coxa 3 adze-shaped, posterior margin weakly excavate,

**Additional characters.** Head cowl-like; combs of gnathopod 2 absent; coxa 7 with posterodorsal hook; inner rami of uropods 1-2 absent.

**Relationship.** Differing from *Dirimus* in loss of inner rami on uropods 1-2, identical and almost simple gnathopods 1-2 with inflated propodi, asymmetrical laciniae mobiles, lack of armaments (other than serrations) on dactyl of pereopod 5, and the presence of a hook on coxa 7. From *Tottungus* and *Tuldarius* in the even, asetose epimer 1-2.

**Species.** *Warragaia rintouli* Berents, 1985 [781].

**Habitat and distribution.** Marine, Australia, New South Wales, Jervis Bay, 8 m, 1 species.

**UROTHOIDAE** Bousfield, 1978

**Diagnosis.** Rostrum weak, head short, ventral cheek strongly developed and projecting ventrally. Antenna 1 of urothoe form, articles 1-3 elongate, geniculate, flagella short. Antenna 2 of urothoe form, article 4 scarcely expanded, with spines either absent or in seriate ranks, all spines on article 4 apicad, no disjunct spine group basal, ventral margin with 2 kinds of setae, elongate plumes, and smaller penicillates, ventral glassy spines poorly developed or absent, article 5 slightly shorter and narrower than article 4, flagellum variable, usually short in female but in male often greatly elongate as in *Bathyporeia* or *phoxocephalid*, and flagellum, plus part of peduncle, often furnished with calceoli. Prebuccal complex massive, epistome scarcely distinct, upper lip dominant. Mandibles bearing stubby, poorly toothed incisors; laciniae mobile, though occasionally vestigial, present on both sides and unlike each other, rakers poorly developed to absent; molar large to medium, minutely fuzzy, almost non-triturative, lacking significant accessory chopper; palp 3-articulate, article 3 rounded apically, setae dominantly apical, with outer setae, setae simple. Lower lip with discrete inner lobes, mandibular extensions of outer lobes well developed. Maxilla 1 with 2-articulate palp, inner plate with fewer than 6 setae. Maxilla 2 ordinary, inner plate with well to poorly developed medial to submarginal row of setae. Maxillipeds with unexpanded bases, normally enlarged plates, outer spinose; palp 4-articulate, article 2 expanded or nasiform, article 4 unguiform to clavate, usually setose, apical nail usually poorly developed. No bale lobes on any maxillae or maxillipeds.

Coxae variable, either of ordinary gammarid form, or coxa 1 very small, or coxa 3 dominant and/or bearing posteroventral lobe, plus other variations. Coxal gills on segments 2-5 or 2-6; brood plates slender. Gnathopods feeble, grossly alike in proportions, carpi elongate, but otherwise highly variable in degrees of palmar development and chelateness, article 3 short. Article 5 of pereopods 3-4 broad, slightly expanded, not deeply lobate, with thick posterior spines; dactyls of pereopods 3-5 well developed, those of pereopods 6-7 variable but usually well developed; pereopod 5 of haustorius form, articles 2, 4, and 5 expanded, articles 4-5 with extensive facial rows of spines in primitive members but declining in derived taxa; pereopods 6-7 alike, or pereopod 7 developed in phoxocephalid fashion, with article 2 broadly expanded and posteroventrally lobate, remainder of articles thin, whole appendage somewhat shortened in comparison to pereopod 6.

Pleopod 2 apparently not inferior; peduncles of pleopods slightly to significantly wider than long, coupling hooks paired on each pleopod; inner rami usually inferior, usually not bearing clothespin hooks (only several species in 2 genera examined). Epimeron 1 strongly developed; epimeron 3 dominant in size and usually in setation. Urosomites ordinary. Rami of uropods 1-2 styliform and spinose or naked or rami absent; peduncles usually only spinose, but 1 genus with linguiform and setose peduncles lacking rami; uropod 3 of ordinary haustoroid-phoxocephalid kind, outer ramus dominant, 2-articulate, peduncle short, flat, expanded; rami poorly setose apically, Telson variable. Antenna 2 with strong sexual dimorphism in several taxa. See key to Haustorioidea.

**Key to Genera of Urothoidae**

1. Uropods 1-2 lacking rami ................................................................. *Cunicus*  
   — Uropods 1-2 with 1 or more rami .................................................. 2

2. Uropod 2 with 1 ramus ................................................................... *Urothopsis*  
   — Uropod 2 with 2 rami .................................................................. 3
3. Telson and uropod 3 stubby, very short ......................................................... 4
   — Telson and uropod 3 of normal length .......................................................... 5

4. Antenna 2 small, article 3 small, weakly bulbous; not nasiform; mandibular palp very small, rakers absent, inner ramus of uropod 3 well developed. Carangolia
   — Antenna 2 large, article 3 very large; nasiform; mandibular palp ordinary, rakers present, inner ramus of uropod 3 tiny. Pseudurothoe

5. Pereopod 7 of phoxocephalid form ................................................................. 6
   — Pereopod 7 not of phoxocephalid form ........................................................... 7

Carangolia J.L. Barnard
Figs 65G, 66H, 67D, 68D, 69G

Carangolia J.L. Barnard, 1961a: 73.

Type species. Carangolia mandibularis J.L. Barnard, 1961a, original designation.

Diagnosis. Pereopod 7 not of phoxocephalid form, thus article 2 not shield-like and rest of leg not slender and short, combined, nor dissimilar from pereopod 6. Uropods 1-2 without rami. Uropod 3 long and slender. Telson ordinary, deeply cleft.


Habitat and distribution. Marine, Cape and Leman Basins or slopes, Marion Island, 110-1861 m, 3 species.

Cunicus Griffiths
Figs 65B, 67F

Cunicus Griffiths, 1974c: 293.

Type species. Cunicus profundus Griffiths, 1974c, original designation.

Diagnosis. Pereopod 7 not of phoxocephalid form, thus article 2 not shield-like and rest of leg not slender and short, combined, nor dissimilar from pereopod 6. Uropods 1-2 without rami. Uropod 3 long and slender. Telson ordinary, deeply cleft.

Species. Pseudurothoe benthedii Ledoyer, 1986 [618B].

Habitat and distribution. Marine, western Bank of Loven, 1100-1150 m, 1 species.
Urothopsis Ledoyer


Type species. Urothopsis brevicaudata Ledoyer, 1967b, original designation.

Diagnosis. Pereopod 7 not of phoxocephalid form, thus article 2 not shield-like and rest of leg not slender and short, combined. Uropod 1 biramous, uropod 2 uniramous, ramus small. Uropod 3 long and slender. Telson ordinary, deeply cleft.

Species. Urothopsis 'brevicaudata Ledoyer, 1967b, 1986 [698].

Habitat and distribution. Marine, Madagascar, shallow water, 1 species.

Urothoe Dana

Figs 65D, 68C, 69J


Egidia Costa, 1853: 170 (Egidia pulchella Costa, 1853, original designation).

Type species. Urothoe 'irostrata Dana, 1853, selected by Stebbing, 1891b.

Taxonomy. Here based on U. elegans Bate; type obscure.

Diagnosis. Pereopod 7 not of phoxocephalid form, thus article 2 not shield-like (but often large and ovate) and rest of leg not slender and short combined. Uropods 1-2 with wrami. Uropod 3 long and slender. Telson ordinary, deeply cleft.

Sexual dimorphism. Males rarely described, peduncles of antennae 1-2 with short male setular tuffs, flagellum of antenna 2 elongate, articles elongate, armaments well developed, calceoli present on peduncle and flagellum.

Variables. Accessory flagellum short, less than half of primary flagellum (U. elegans), well developed (U. brevicornis, etc.); flagellum of antenna 2 essentially articulate (U. pulchella); article 1 of mandibular palp elongate (U. orientalis, etc.); maxilla 1 palp shorter than outer plate (U. carda, etc.); coxae 1-5 diverse, with sharp corners, coxa 1 reduced, coxa 5 unlobed (U. orientalis), other coxal variations from type common; gnathopods 1-2 similar, with article 6 short, stout, expanded into poorly defined palm (U. elegans etc.); gnathopods 1-2 similar, article 6 elongate, slender, palmar surface short, blunt (U. grimaldii, etc.); gnathopods 1-2 dissimilar, gnathopod 1 simple, article 6 elongate, slender; gnathopod 2 with suboval or expanding propodus, palm distinct, rounded (U. falcata, etc.); article 7 of pereopod 5 spinose (U. spinidigitus, etc.) or not (type), article 2 of pereopod 5 almost shield-shaped as in Urothoides (U. oniscoides); epimeron 3 rounded or toothed; uropod rami curved or straight; uropods 1-2 setose (various) or not (type); uropod 3 inner ramus longer or shorter than outer ramus; telson cleft fully or partly.


Habitat and distribution. Marine, cosmopolitan in both shallow and deep waters, 0-4893 m, 36 species.

**Urothoides** Stebbing


**Type species.** *Urothoe lachneessa* Stebbing, 1888, monotypy.

**Diagnosis.** Peracopod 7 of phoxocephaloid form, thus article 2 shield-like and rest of leg slender and short. Gnathopods 1-2 with rami. Uropods 3 long and slender. Telson ordinary.

**Variables.** Gnathopods 1-2 dissimilar (type); gnathopods 1-2 alike (Australian species).


Habitat and distribution. Marine, southern Australia to Kerguelen Island, and Cedros Trench, Mexico, 3-2667 m, 10 species.

**VITJAZIANIDAE** Birstein & Vinogradov, 1955

**Diagnosis.** Peduncle of antenna 1 short; accessory flagellum long, composed of a few long articles; base of primary flagellum with calycophore. Gnathopod 1 simple, gnathopods feeble. Coxae short.

See Hyperiopsidae, Stilipedidae (= Asyridae), Synopiidae, Eusiridae, Liljeborgiidae, Melphidippidae, Aplopoidea and Iphimebriidae.

**Description.** Body laterally compressed, long, smooth (or scarcely carinate), pereon thin, pleon dorsoventrally thick, segments free. Head small or medium, ordinary, rostrum weak to medium, lateral cephalic lobes protruding, rounded or angular, no distinct anteroventral excavation for antenna 2; eyes absent. Antenna 1 of medium length, primary flagellar articles 2-n scarcely longer together than article 1 of primary flagellum; antenna 2 as long as 1 or very much longer, article 5 of peduncle as long as 4 or longer (versus Hyperiopsidae).

Telson minutely incised. Mandibular body stocky, incisor small and scarcely toothed, lacinia mobilis present on both sides, rakers sparse, molar well developed, triturative, palp well developed, article 3 shorter than 2, expanded or linear. Labium ordinary, inner lobes present or absent, papillae insignificant. First maxillae symmetrical, inner plate of medium size, partly to fully setose marginally, outer plate and palp ordinary. Plates of maxilla 2 subequal, inner with medium sized facial row of setae. Maxilliped like Hyperiopsidae, plates very broad, with large outer plate, palp slender, 4-articulate, dactyl long, unguiform.

Coxae barely touching, minute or of medium length, diversity weak, coxa 4 not lobate. Carpus of gnathopod 1 shorter or longer than propodus, latter very slender, weakly tapering, simple, dactyl elongate, gnathopod 1 thus appearing like ordinary pereopod 3; carpus of gnathopod 2 as long as or longer than propodus, latter like gnathopod 1 or rectilinear and with distinct short oblique palm. Pereopods 3-4 ordinary or elongate, articles 5-6 ordinary or elongate, dactyls short or long. Pereopods 5-7 short or long, article 5 in *Vitjaziana* immensely elongate (articles 6-7 of these pereopods unknown in *Vitjaziana*).

Epimera large. Pleopods [ordinary]. Urosome weakly carinate. Uropods 1 variable, long or short, apices reaching in 1 2/3 or 3 2 1 order, rami much longer to much shorter than peduncles; outer rami of uropod 1 occasionally shorter than inner, rami spinose or not. Telson short, slightly cleft, poorly armed.

**Relationship.** Very close to the Hyperiopsidae, especially in the general appearance of the mandibles (bulky, incisors short and poorly toothed, rakers few), the maxillipeds (plates very broad, outer large but palp dominant, thin, and elongate), the feeble gnathopods (the first simple), the calycophore on the primary flagellum of antenna 1, and the long accessory flagellum. Differing from Hyperiopsidae in the nondominant article 4 of pereopods 4-4, which however in *Vitjaziana* is admittedly long and thin but not so dominant as in Hyperiopsidae, the regular palps of the first maxillae (not bent and wavy), and the ordinary length of article 5 on antenna 2.

The Stilipedidae (= Asyridae) have reduced accessory flagella, reduced molars, broad dominant carpi on the gnathopods, no calycophore on the primary flagellum of antenna 1 and much larger coxae with coxa 1 broader than coxa 2.

Differing from the Eusiridae in the elongate accessory flagellum, most Eusiidae have subchelate gnathopods or longer coxae or less strongly developed calycophore on the primary flagellum of antenna 1 and long peduncles of the first antennae.

Synopiidae have a very large and strongly rostrate head or the head is tiburoniid (shark-nosed or parrot-
headed). Melphidippidae have very elongate antennal peduncles and carinate bodies.

Argissidae have a special configuration of coxae. Liljeborgiidae have large subchelate gnathopods with dominant propodi.

The Vitjazianidae, especially Vemana, have close similarity to Cleippides in the Iphimediidae but Cleippides has more dominant carpi on the gnathopods, the main flagellum of antenna 1 does not have a strong callynophore, the body is often carinate and the accessory flagellum is vestigial or absent.

Key to Genera of Vitjazianidae

1. Gnathopod 2 simple; coxae minute, broader than long; article 5 of pereopods 5-7 immensely elongate; palp article 3 of mandible and palp article 2 of maxilla 1 linear or slender ........................................................................................................................... Vitjaziana

——Gnathopod 2 subchelate; coxae 1-4 of ordinary length, almost as long as broad; article 5 of pereopods 5-7 not elongate; palp article 3 of mandible and palp article 2 of maxilla 1 clavate or expanded ........................................................................................................................... Vemana

Vemana J.L. Barnard

Fig.133A


Type species. Vemana compressa J.L. Barnard, 1964a, original designation.

Diagnosis. Palp article 3 of mandible expanded, clavate. Palp of maxilla 1 expanded apically. Dactyl of palp on maxilliped bearing nail. Coxae 1-4 of ordinary length, almost as long as broad but coxae 5-7 much shorter. Gnathopod 2 subchelate, article 5 not longer than 6. Pereopods 5-7 short, with short article 5 and elongate article 2. Peduncle of uropod 1 barely reaching base of uropod 2, outer ramus shortened; outer ramus of uropod 3 2-articulate.


Habitat and distribution. Marine, middle American seas, western, Indian Ocean, 1826-4077 m, 4 species.

Vitjaziana Birstein & Vinogradov

Fig.133B


Type species. Vitjaziana gurjanovae Birstein & Vinogradov, 1955, original designation.

Diagnosis. Palp article 3 of mandible slender, linear. Palp of maxilla 1 linear. Dactyl of palp on maxilliped lacking nail. Coxae minute, broader than long. Gnathopod 2 simple, article 5 longer than 6. Pereopods 5-7 very long, with elongate article 5 and short article 2. Peduncle of uropod 1 almost reaching apex of peduncle on uropod 2, outer ramus not shortened; outer ramus of uropod 3 2-articulate.


Habitat and distribution. Marine, north-west Pacific Ocean, 4200-6500 m (confirmed), 1 species.

ZOBRAchodidae Barnard & Drummond, 1982c

Diagnosis. Rostrum well developed (for haustoriods), cheek poorly developed. Antenna 1 variable, article 1 short (typical) or elongate (apomorphic), articles 2-3 progressively shorter (typical) or elongate (apomorphic), flagella elongate (typical) or not (apomorphic), articles of peduncle weakly (typical) to strongly geniculate. Antenna 2 of haustorius form, article 4 expanded (pleisomorph) or weakly so (apomorphic), with facial spines near base, article 5 shorter and narrower than article 4, these articles furnished with 1 or more longitudinal rows of facial armaments, ventral margin of article 4 with at least 3 kinds of setae: (1) elongate plumes, (2) shorter and stiffer glassy spines usually set in clusters and, (3) bulbar-based penicillate setules; flagellum longer than article 4 of peduncle. Prebuccal complex massive, upper lip usually dominant. Mandibles bearing elongate
strongly toothed incisors, laciniae mobiles present on both sides and unlike each other, rakers almost simple and numerous (4 or more), molar large, strongly extended, weakly triturative but with several strong cusps, usually 1 of these forming accessory chopper; palp 3-articulate, article 3 with numerous outer and inner setae forming fan, setae awned (apomorphic) or not (plesiomorphic). Lower lip with discrete inner lobes, mandibular extensions of outer lobes well developed. Maxilla 1 with 1-articulate palp, inner plate with oblique facial row of setae but poorly developed. Maxillipeds with unexpanded bases, normally enlarged plates, outer spinose; palp 4-articulate, article 2 expanded, article 4 clavate, multiseteose. No baler lobes on maxillae or maxillipeds. Coxa 2 small to medium, larger than coxa

1 and forming stepped intergrade between coxa 1 and coxa 3, coxa 4 dominant, coxa 3 lacking deep posterоventral lobe. Coxal gills on segments 2-6 or 2-5. Brood plates slender.

Gnathopods feeble, subchelate, grossly alike in proportions, carpi elongate, article 3 short. Article 5 of pereopods 3-4 broad, slightly expanded, not deeply lobate, with thick posterior spines; dactyls of pereopods 3-5 well developed, those of pereopods 6-7 variable; pereopod 5 of haustrum form, articles 2, 4, and 5 expanded, articles 4 & 5 with extensive facial rows of spines; pereopods 6-7 alike, articles 5-6 weakly expanded; no pereopod with underslung articulation.

Pleopod 2 usually inferior in size, articulation, or setation; peduncles of pleopods not longer than wide,
inner rami inferior; coupling hooks paired on each pleopod, usually inner rami bearing 1 basal clothespin spine. Epimeron 1 moderately to strongly developed; epimeron 2 dominant in setation, often dominant in size. Urosomites ordinary, though often furnished with lateral teeth. Rami of uropods 1-2 linguiform, setose (not spinose); uropod 3 of ordinary haustoriid-phoxocephalid kind, outer ramus dominant, 2-articulate, peduncle short, flat, expanded; rami poorly setose apically. Telson variable in length, deeply cleft.

See key to Haustorioidea.

Sexual dimorphism. Weak.

Key to Genera of Zobrachoidae
(see also Clark & Barnard, 1987, for another key)

1. Antenna 1 of urothoe form ............................................................ 2
   — Antenna 1 of haustorius form .................................................. 3
2. Article 4 of antenna 2 slender, epimeron 2 as large as epimeron 3 ................................................ Prantinus
   — Article 4 of antenna 2 broad, epimeron 2 much smaller than epimeron 3 ..................................... Tonocote
3. Telson elongate, rami of uropods 1-2 with many medial setae, no baso-ventral setae .......................... Zobracho
   — Telson short, rami of uropods 1-2 lacking medial setae, bearing basoventral setae .......................... 4
4. Inner rami of uropods 1-2 present ............................................. Bumeralius
   — Inner rami of uropods 1-2 absent ......................................... Chono

Bumeralius Barnard & Drummond
Figs 65H, 66I, 67B, 68A, 69E
Bumeralius Barnard & Drummond, 1982c: 27.

Type species. Bumeralius buchalius Barnard & Drummond, 1982c, original designation.

Diagnosis. Antenna 1 of haustorius form, thus article 1 stout, article 3 short. Epimeron 3 dominant, epimeron 2 setose, epimeron 1 naked. Rami of uropods 1-2 lacking medial setae, bearing basoventral setae. Telson short.

Additional characters. Rostrum short; inner plate of maxilla 1 narrowed, with 1 basomedial seta and 5 setae enveloping apex.

Relationship. Differing from Zobracho in the short telson and sparser and more specialised setation on the rami of uropods 1-2, narrowed inner plate of maxilla 1 with specialised setation pattern and shorter rostrum.

Species. Bumeralius buchalius Barnard & Drummond, 1982c: [784].

Habitat and distribution. Marine, Victoria and New South Wales, 0 m, 1 species.

Chono Clark & Barnard

Type species. Chono angustiarum Clark & Barnard, 1987, original designation.
**Diagnosis.** Antenna 1 of caudal form, thus articles 1-2 slender, article 3 short, weakly geniculate. Epimeron 3 dominant, poorly setose, epimeron 1 weak and naked, epimeron 2 small, with few long setae. Rami of uropods 1-2 lacking subapical setae. Telson short.

**Additional characters.** Rostrum short; inner plate of maxilla 1 narrowed, with 2 apicominal setae.

**Relationship.** Differing from its closest counterpart *Prantinus* and all other zibrachoids in the loss of the inner rami on uropods 1-2.

**Species.** *Chono angustiarum* Clark & Barnard, 1987

**Habitat and distribution.** Marine, Magellan Strait, 11-12 m, 1 species.

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**Prantinus** Barnard & Drummond

Figs 65C, 67A, 68H, 69C

*Prantinus* Barnard & Drummond, 1982c: 36.

**Type species.** *Prantinus talanggi* Barnard & Drummond, 1982c, original designation.

**Diagnosis.** Antenna 1 of urothoe form, thus articles 1-2 slender, article 3 short, weakly geniculate. Epimeron 3 dominant, poorly setose, epimeron 1 weak and naked, epimeron 2 small, with few long setae. Rami of uropods 1-2 lacking subapical setae. Telson short.

**Additional characters.** Rostrum short; inner plate of maxilla 1 narrowed, with 2 apicominal setae.

**Relationship.** Differing from *Prantinus* in the broad article 4 of antenna 2 and the inferior epimeron 2.

**Species.** *Tonocote magellani* Clark & Barnard, 1986

**Habitat and distribution.** Marine, Magellan Straits, 11-12 m, 1 species.

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**Tonocote** Clark & Barnard


**Type species.** *Tonocote magellani* Clark & Barnard, 1986, original designation.

**Diagnosis.** Antenna 1 of urothoe form, thus articles 1-2 slender, article 3 short, weakly geniculate. Epimeron 3 dominant, poorly setose, epimeron 1 weak and naked, epimeron 2 small, with few long setae. Rami of uropods 1-2 lacking subapical setae. Telson short.

**Additional characters.** Rostrum short; inner plate of maxilla 1 narrowed, with 2 apicominal setae.

**Relationship.** Differing from *Prantinus* in the broad article 4 of antenna 2 and the inferior epimeron 2.

**Species.** *Tonocote magellani* Clark & Barnard, 1986

**Habitat and distribution.** Marine, Magellan Straits, 11-12 m, 1 species.

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APPENDIX I

Dissection of an Amphipod for Right-handed Operators

All data for the sample collection of the amphipod 'species' are written on a card and each specimen assigned a code letter or number.

Measurements. A fairly exact measurement can be made as outlined in Barnard & Drummond (1978). The amphipod is mounted temporarily in its preservative on a deep depression slide with cover glass applied. Under low power microscopy with camera lucida a line is drawn on paper from the front of the head to the apex of urosomite 3 along a parabolic curve just above the coxae more or less along the lower gut line. The line on paper is then measured and converted to millimeters, preferably to hundredths on a code letter or number.

A pair of jeweller's forceps with very fine points, a fine dissecting needle such as an insect pin mounted on a stick plus one additional depression slide for discarded damaged materials, and thin cover slips are needed. After labelling and to ameliorate the glare of reflected light from projecting specimens can be placed in a microprojector and the bodies of restricting the manipulation of mounted parts for dimensional observation; parts from glycerin slides may be removed and stored permanently in alcohol in a tiny vial made in a fire, the other end stoppered with cotton or pith (plastic foam is biodegradable).

Before dissection one follows the precepts of the amphipod analytical sheet (Appendix II) on relationships of undissected parts to each other. One commences removing the pereopods (legs) of the amphipod at either the fourth or fifth coxa (sideplate) depending on which of these coxae is largest or would pull away from the body without entangling other legs or coxae. The amphipod is upside down on its left side, being held with a coarse needle in the left leg projecting away from the operator, so that it appears upside down through the oculars of the stereoscope. The body is covered to more than twice its depth with mounting medium filled with glycerin. Permanent slides have the disadvantage of the desired fluid to alcohol over a period of 1-4 hours. Continuous observation is required to prevent rapid shrinkage of the specimens owing to osmotic effects.

Dissection. For right-handed operators. In a flat-bottomed syracuse dish, the amphipod is laid on its left side with its legs projecting away from the operator, so that it appears upside down through the oculars of the stereoscope. The body is covered to more than twice its depth with mounting medium to prevent the effects of surface tension during dissection and to ameliorate the glare of reflected light from projecting legs.

A fairly exact measurement can be made as outlined in Barnard & Drummond (1978). The amphipod is mounted temporarily in its preservative on a deep depression slide with cover glass applied. Under low power microscopy with camera lucida a line is drawn on paper from the front of the head to the apex of urosomite 3 along a parabolic curve just above the coxae more or less along the lower gut line. The line on paper is then measured and converted to millimeters, preferably to hundredths on a code letter or number.

A pair of jeweller's forceps with very fine points, a fine dissecting needle such as an insect pin mounted on a stick plus one additional depression slide for discarded damaged materials, and thin cover slips are needed. After labelling slides with specimen code and morphological code a small drop of glycerin (or other mounting medium) is placed on the flat slides, and the depression-slide concavity is sparingly filled with glycerin. Permanent slides have the disadvantage of restricting the manipulation of mounted parts for 3-dimensional observation; parts from glycerin slides may be removed and stored permanently in alcohol in a tiny vial made of a bit of capillary tubing with one end closed by melting in a fire, the other end stoppered with cotton or pith (plastic foam is biodegradable).

Before dissection one follows the precepts of the amphipod analytical sheet (Appendix II) on relationships of undissected parts to each other. One commences removing the pereopods (legs) of the amphipod at either the fourth or fifth coxa (sideplate) depending on which of these coxae is largest or would pull away from the body without entangling other legs or coxae. The amphipod is upside down on its left side, being held with a coarse needle in the left
hand through a body segment or with forceps or a blunt stick, and the coxa is either being pulled and ripped gently at its base with the fine forceps or various instruments are used to scissor apart the segment above the coxa so that the integrity of the proximal coxal margin is maintained. In most cases the coxa can be pulled free of the body carrying some of its proximal musculature and part of the segment. Occasionally the firmness of the attachment dictates the use of a fine scalpel.

When the coxa is removed, the remainder of the leg and gill (and, if it is a female, the brood lamella) will come with it. As the legs are excised, identifying structures such as gill and ostogonite sizes are recorded. Antennae 1 and 2 are dissected at their bases (right side only). Care in removal of antenna 2 at its juncture is needed because it often breaks easily at joint 2 or 3 and also may bring away the mandible or tear the prepubal parts.

The seven coxae-legs and two antennae are removed from the dish to the flat slides with the drops of glycerin. When placed in the glycerin the parts, if being taken from a specimen in alcohol, might disperse the drop, but a light breath of air will accelerate evaporation of the alcohol and the amalgamation of the puddle. The legs must be fully immersed in the glycerin to prevent drying and uptake of air bubbles.

After making observations in the analytical sheet, the right uropods 1, 2 and 3, both lobes of the telson, and one member of each pair of the pleopods are removed and placed on flat slides with tiny drops of glycerin. All parts are manipulated, while the glycerin puddles coalesce, and arranged so that their respective dorsal (uropods) and anterior (pleopods) sides are up and so that legs are viewed from the left anterior. An arm generally should be removed by actually first removing its segment to a glass slide glycerin puddle and then teasing away the segment from the base of the telson. Generally it is wise to dissect off right gnathopods 1-2 also and place them on slides as if they were left lateral; this provides slides to show the medial surfaces of those gnathopods.

A clean cover slip, taken from a jar of alcohol and dried with fine tissue, then gripped in the forceps, is lowered horizontally over the glycerin of each slide until it can be dropped smartly onto the puddle without engaging air bubbles. Glycerin is to be applied sparingly so as to prevent excessive sliding of the cover slip. If the perimeter of the cover slip lacks glycerin it may be added later by placing a small drop at the edge.

Before removing mouthparts determine whether or not they are grouped in a coniform or quadratiform bundle from lateral view.

Mouthparts are removed from the head, again with the amphipod head pointing away from the observer so that motion to the right with the forceps can be used to snap off the mouthparts. The maxillipeds, which are the most posterior legs 2 to 7 (or 2-6 or 2-5) are removed and placed in sequence upward or are dissected at their bases and removed. Mandibles will come with it. Generally it is wise to dissect off right gnathopods 1-2 also and place them on slides as if they were left lateral; this provides slides to show the medial surfaces of those gnathopods.

A clean cover slip, taken from a jar of alcohol and dried with fine tissue, then gripped in the forceps, is lowered horizontally over the glycerin of each slide until it can be dropped smartly onto the puddle without engaging air bubbles. Glycerin is to be applied sparingly so as to prevent excessive sliding of the cover slip. If the perimeter of the cover slip lacks glycerin it may be added later by placing a small drop at the edge.

Before removing mouthparts determine whether or not they are grouped in a coniform or quadratiform bundle from lateral view.

Mouthparts are removed from the head, again with the amphipod head pointing away from the observer so that motion to the right with the forceps can be used to snap off the mouthparts. The maxillipeds, which are the most posterior parts project upward or are on top: mandibular gnathopods, uropod 3 and any other possible parts that might reflect secondary sexual differences, should be prepared for rapid identification; but a full dissection should be prepared
for descriptive purposes.

Parts of greatly differing thickness should not be intermingled on the same slide as the thinner parts will not be properly fitted by the cover slip. Delicate parts may need artificial support of the cover slip as noted above in discussion of the mandibles. The authors keep several vials of sand and silt of differing grain sizes available to select various grains to place under cover slips for elevation of the cover slip. Dirt may be removed from heavily setose appendages by use of a fine camel's-hair brush or very careful use of highly diluted hydrogen peroxide or sodium hypochlorite (in the United States commonly sold as 'bleach' or 'clorox'). Sonic cleaning is also possible but much practice on unimportant specimens must be undertaken before attempting this on unique specimens.

Eventually the student will gain sufficient experience for examination of most parts without dissection. Even mouthparts can be partially to fully examined by careful manipulation under a fine stereoscope with adequate two-directional light sources. Mandibles often can be rotated for viewing molars without their complete removal. This protects unique specimens from unnecessary damage or loss of parts or the need to mount parts permanently.

Illustrating. The taxonomist anticipating a need to illustrate the organism must undertake a different course of dissection. If a body view is required and the amphipod is already highly translucent it may be possible to mount it before dissection in a depression slide, ensure its rigidity against movement and simply draw it on a compound microscope fitted with camera lucida. However, if some of the left coxae are obscured by opacity from opposite appendages the right coxae may have to be removed carefully without losing integrity on the side to be drawn. The right pleopods might also be removed. We prefer depicting the left side of the body and left sided appendages because the body drawing is then arranged for publication with the anterior or dorsal margin toward the left side of the page (the normal direction from which a written Romance or Anglo-Saxon language is deciphered; this method also evolved from the publishing standards of several USA government agencies many decades ago); other language cultures may prefer right sided illustrations. The lateral in toto drawing represents a composite reconstruction of body and coxae drawn first, with extirpated legs superimposed on the drawing by use of a microprojector or camera lucida in which degree of magnification can be replicated. After the preliminary body drawing is accomplished the left thoracic legs are removed and mounted on slides as discussed above. In this way legs are attached to the body drawing in perfectly flat but somewhat unnatural condition. One must determine accurately the attachment loci of the legs to their coxae by study of the slides.

If the body segment margins are difficult to see one may remove the pleon to a new slide and then, one by one, dissect the pereonites off the carcass, starting with segments 7, 6, 5, followed by removal of the head to obtain the anterior margin of segment 1 and then continue pulling off segments 4, 3, and 1 until only segment 2 remains for analysis. As each segment is removed the carcass is remounted with cover slip and adjusted to the proper lateral position to reconstruct onto the drawing the shape of the segmental line. Note that it is more important to determine the anterior margin of segment 1 than, for example the posterior margin of segment 2 and hence one must view the anterior margin of segment 1 before too many other segments are removed and body integrity is lost.

An enlarged view of the pleon is now undertaken preferably with the pleopods attached so that they can also be added to the drawing. The right-sided pleopods and uropods can be removed to facilitate light transmission and untangling of rami.

An enlargement of the pleon is desirable to show details of the uropods and margins of the epimera so that before dissection its details can be added to the in toto view and new enlarged drawing. Then, if pleonite segmental lines are difficult to see, one may duplicate the method for the thorax by pulling off segments one by one and remounting the pleonal carcass; this is generally mandatory to observe posterior margins of epimera; as each segment is removed it is placed on a glass slide where further dissections of parts will be necessary later to provide dorsal views of uropods and telson plus flat-sided views of uropods. Details are added both to the in toto view and the enlargement of the pleon. When a slide for telson is ultimately prepared the segment should be teased away from the telson so as to preserve the basal telsonic margin (do not pull the telson off of the segment because this damages valuable characters). Uropod 3 is preferably left attached to urosomite 3 with the telson and mounted flat and drawings of both attempted; if uropod 3 does not flatten properly then it must be removed to its own slide. Each of uropods 1 and 2 are preferably retained together as attached to their individual segments, the top of each segment destroyed and each segment flattened from the top by the cover slip. This results in these uropods being mounted dorsal side up rather than in the oblique position normally resultant from a fully dissected uropod.

Preserved amphipods frequently have broken appendages. Sometimes the loss of uropod 3 is a consistent occurrence especially in gammarids and oedicerotids. So few Gammaridea lack a third uropod that the first assumption always should be that the part has been removed accidentally and close examination should be made for sockets and musculature indicating the loss.

Antennae are often broken and such specimens should be avoided until experience is sufficient to recognise amphipods by other means. In the photid-corophiid complex, legs (except gnathopods) and antennae are frequently autotomised when the animals are preserved, and specialists usually have found other means of identification in those families.

The ecologist making a study of a single species should be prepared to take special care in preservation of material to ensure completeness of the specimens. One may find slow dilution of seawater or special anesthetics suitable to kill the organism slowly and to prevent autotomy.
APPENDIX II

Amphipod Analytical Sheet

A Checklist of Characters to be Examined before Using Keys

Before the keys are utilised for the identification of an amphipod, the morphological characteristics of the organism should be determined. This requires a complete dissection, mounting, and examination of parts on microscope slides as discussed in Appendix I. The following checklist may be useful as a guide to characters that should be determined. This procedure is very laborious at first but pays dividends in the final result and makes familiar, more rapidly, those characters which ultimately are most important. Principal characters are italicised.

The checklist is designed to indicate the characters present by circling the pertinent items in the sentences, or adding percentages to blanks or zeros to the ends of inappropriate sentences. Descriptive phrases applied to various shapes are minimal in number; the observer may have to compose further refinements. But descriptive refinements can be overextended to the unnecessary wastage of time, for this checklist applies to initial analysis of the generic position and does not apply to fine details necessary for specific identity.

One may find it useful to replicate copies of this checklist for the keeping of records.

BODY

Pereon [mesosome] and Pleon [combining metasome and urosome]

General, segments:
- Abnormal disproportion or enlargement (example, Danaella).
- Cylindricalisation (examples, Colomastigidae, Eophliantidae).
- Dorsal depression with or without splaying of coxae (examples, Eophliantidae, Corophium).

Ornamentation:
- Teeth, dorsal and lateral; pereon 1, 2, 3, 4, 5, 6, 7; pleon 1, 2, 3, 4, 5, 6.
- Spine or setal groups, dorsal, especially on pleon 1, 2, 3, 4, 5, 6.
- Elongation of metasome: example, is it as long as 5 or 6 pereonites? (for distinguishing a few Gammaridae and Eusiridae).

Urosome:
- Dorsal depression (examples, Corophiidae, Cheluridae).
- Elongation of urosomite 1 (example, Dulichiidae).

Pleonal epimera:
- Shape and ornamentation from lateral view, especially of epimeron 3 (primarily for identification to species).

Size:
- Normal: like basic gammaridean, 1-4 of medium length, subquadrate, 5-7 shorter, successively smaller, 8-6 slightly lobed.
- Elongation (example, Stegocephalidae).
- Reduction (example, Dulichiidae).
- Disproportional sizes of 1-4: 1 long, 2 shorter, 3 shorter, 4 long (example, Argissidae).
- Coxa 1 absent or vestigial (rare examples, Hateridae, Anamixis).
- Coxa 1 reduced in size and partially to fully covered by following coxae (example, Stenothoidae, ‘surgery’ amphibid specimen in unflexed condition for proper observation).
- Coxae 1-2 or 1-3 reduced in size and covered by following coxae (primarily genera of Lysianassidae).
- Coxa 3 larger than 4 (example, Synopiidae).
- Coxa 5 as long as 4 (occasional).

Position:
- Serial contiguity: coxae contiguous or overlapping.
- Serial discontinuity (example, Dulichiidae, Eophliantidae).
- Concealment of one coxa by another (see above).
- Lateral splaying (Philantisidae).

Shape:
- Coxe 1-4 subquadrate.
- Acumination of coxae 1, 2, 3, 4.
- Excavation posteriorly of coxa 4: posterior margin straight, concave or deeply excavate and/or bearing posterior lobe (contrast Stegocephalidae and Corophioidae).
- Coxa 1 tapered, expanded, oval, semicircular, quadratoconical, acutely lobed.
- Ventral serrations.

Special patterns:
- Disproportional sizes of 1-4 (Argissidae, see above).
- Crescentic curve formed ventrally by coxae 4-5 together (example Epimeria).

HEAD

Size:
- Length as a function of one or more pereonites (1, 2, 1-3), head measured on horizontal axis from front of lateral lobe to perpendicular line from posterior cephalic extent.
- Head length has been found to be correlative both to total body length and instar stage.
- Massive (see definition in glossary).

Shape:
- Normal gammaridean: head cuboidal, with lateral lobes.
**Globular:** subspheroid; neck cylindrical.  
*Galeate* (see definition in glossary).

**Rostrum:**
Length in relation to head ( %) and to article 1 of antenna 1 ( %).  
Shape: acute, spatulate; horizontal, deflexed.

**Lateral lobe:**
Shape and extent of projection.  
Notch or ornamentation.  
Ocular bulge on side of head.  
Marginal details of anteroventral corner of head near insertion of antenna 2.

**EYES**

**Composition:**
Presence or absence (careful examination required because eyes often lose pigment in preservative).  
Paired ommatidial mass below cephalic cuticle (common).  
*Cuticular lenses* in lateral pairs (*Ampeliscidae* almost exclusively). Occasionally lenses occupy anterior surface of head.  
Diffused pigment or stain.  
*Quadrigeminous lenticular bodies* (example, *Argissidae*).  
Bright pigmented masses enveloping brain (especially *Ampeliscidae*).  
Shape: ovoid, flask-like, reniform.  
Position:  
Near lateral cephalic surface.  
in rostrum (especially *Oedicerotidae*).  
*Dorsally confluent* (especially *Oedicerotidae*).  
Accessory detached ommatidia (pattern often confused by preservational accidents).  
Occupying cephalic extent almost fully (*Hyperiopsidae*).

**ANTENNA 1**

Length:
As percent of total body (front of head to base of telson ( %).  
In relation to antenna 2 and to its peduncle ( %).

Flagellum:
Proportion to peduncle ( %).  
Elongation of basal article (often conjoint, composed of incompletely segmented articles).  
Proportion to peduncular article 3, especially when latter elongated ( %).  
Number of articles: 0, 1, 2, 3, 4, 5, 6-10, 11-15, 16+.

Peduncle: Proportion to head.
Relative lengths of all three articles (value of 100 assigned to length of article 1): 1=100%; 2=( %); 3=( %).  
Ornamentation on any article, all sides.  
Distinctive spines or setal bundles.

**ANTENA 2**

Length as percent of body length (including head) ( %).  
Peduncle: proportion to head ( %).  
Relative proportions of articles: 4=100%; 5=( %).  
Tumidity of articles 3, 4, or 5; article 1 large and subspherical.  
Gland cone and/or *ensiform process* on articles 2 and 1; extreme enlargement and shape. (*Ensiform process* generically important primarily in *Phoxocephalidae*, Gland cone often medial and hidden from lateral view).  
Flagellum: proportion to peduncle ( %) or article 5 ( %).  
Number of articles: 0, 1, 2, 3, 4, 5, 6-10, 11-15, 16+.  
Ornaments:
Aesthetascs, calceoli on peduncle and/or flagellum.  
Distinctive spine groups.  
‘Fossorial’ condition, with long plumose setae.

**MOUTHPARTS**

From lateral view forming a conical bundle below head (rare) or a quadrate bundle (common). To be examined before dissection.  
Reduction and amalgamation of mandibles and maxillae along a ventral keel (*Anamixidae*).

**EPISTOMAL-LABRAL COMPLEX** (prebuccal)

Lateral view (primarily of generic importance in *Lysianassidae*):
Epistome and labrum separated by notch (common) or conflued.  
Epistome formed as lobe dominating labrum, vice versa, or produced together.  
Shape of lobes:  
Epistome: flat, rounded, acute.
Labrum: flat, rounded, acute. Prebuccal mass inconspicuous and of normal gammaridean proportions.

**UPPER LIP (anterior view)**

Ventral margin: rounded, truncate, incised, lobed asymmetrically or symmetrically.

**MANDIBLE**

*Shape and size of body:* bulky (Synopiidae), styliform (Iphimiidae), elytriform (Stegocephalidae, Pardalisididae), OR normal (Gammaridae).

_Incisor:* normal, extremely broadened; needle-like, toothed, untoothed, teeth separated by flat margin.

_Lacinia mobilis,* if present on either right or left mandible: toothed, special shape such as vermiform.

_Raker spines proximal to lacinia mobilis:* 1-2; 3-6; 7+.

_Molar:* Absent.

_Size:* small (Fig.65C), medium (Fig.65A), large (Fig.65D), fully dominating mandible (Fig.129E).

*Shape:* cylindrical, cuboidal, laminated, conical, tuberous.

_Texture:* triturative (rasp-like), spinose (spines articulate), setulose, minutely fuzzy, striate, smooth.

_Accessory seta or spine on triturative molar._

_Palp:_

_Number of articles:* 0, 1, 2, 3.

_Attachment position relative to molar:* over (level with), distal to, proximal to (variation from "level" primarily in Lysianassidae).

_Relative length of articles:* 1≈( %); 2=100%; 3≈( %).

*Shape:* Article 3: cylindrical, falconiform, tuberculiform.

_Article 2:* occasionally curved strongly.

_Article 1:* rarely with distal cusp.

_Setation:* article 3: distal only, medial.

_Disymmetry of right and left members (especially lacinia mobilis, incisor, spine-row)._ 

**LOWER LIP**

_Normal gammaridean (Fig.1)._ Inner lobes: *weak* (Fig.60G), *absent._

_Mandibular projection of outer lobes:* pointed, obtuse, absent.

_Outer lobes:* _distally notched; medi ally excavate (Ampithoididae, Fig.26A)._ 

_Special shapes:* Pleustidae (Fig.115A), Trischizostoma (Fig.90T).

**MAXILLA 1**

**INNER PLATE**

_Size:* absent (very rare), small (Fig.25D), medium (Fig.1), as large (broad and bulky) as outer plate (rare).

_Setation:* _terminal, medial, or both._

_Number of setae:* 1, 2, 3, 4-6, 6-12.

_Structure of setae:* normal; sickle-shaped or strongly constricted.

_Outer plate:_

_Number of spines:* 1-4, 5-6, 7-8, 9-11+.

_Shape of spines:* normally slender, extremely stout, some bifid, some serrate, in two distinct groups by position or structure.

_Palp:_

_Number of articles:* 0, 1, 2.

_Normal structure:* article 1 short, article 2 long.

_Article 1 long, article 2 short._

_Modifications:* _strongly bent (geniculate), foliaceous, bearing scales (examples: Stilipedidae, Hyperiopsidae)._ 

**MAXILLA 2**

_Normal gammaridean (Fig.1)._ Abnormally small, plates partially coalesced, setae very sparse.

_Breadth of lobes:* subequal, inner broader, outer broader.

_Axial divergence of lobes (Fig.123A)._ 

_Extension of outer plate on basal article (Fig.123D)._ Specialised spines (rare).

_Extent of medial setation on inner plate: strong, sparse, absent._

_Presence of oblique facial setal row on inner plate._

**MAXILLIPED**

_Inner lobes (proximal):_

_Size:* vestigial (Fig.103C), normal (Fig.1). 

_Abnormal shape:* foliaceous (rare), styliform (note: inner lobes often appear styliform if not fully depressed by cover slip).

_Outer lobes:_

_Size relative to inner: usually larger, _vestigial* (Fig.126G), foliaceous (rare)._ 

_Spination:* absent, medial, distal.

_Palp:_

_Extension in relation to outer plate:* shorter, equal, longer.

_Number of articles:* 0, 2, 3, 4.

_Medial or terminal extensions of articles,* e.g., lobes, cusps:

_articles 1, 2, 3._

_Elongation of articles 1, 2, 3._ 

_Terminal palp article (usually 4): claw-like (normal); barrel-shaped; vestigial; bearing distal nail, spine, or setae._

**GNATHOPODS**

_Judgment of gnathopods 1-2 as: feeble together (Fig.127C). _

_normal (basic gammaridean with gnathopod 2 powerful)._
GNATHOPOD 1 (excluding coxa 1)

Present, vestigial, or absent (Bateidae and Paranamixis only).

Size (or length) relative to gnathopod 2: smaller, equal, larger.

Sexual dimorphism: similar or different in male and female.

Articles:

2: Length in relation to coxa 1 (rarely important except when coxa 1 abnormal).
3: Length normal; or elongate (like Fig.92K).
4: Merochelation: with strong thumb-like extension (rare).
5: Length relative to article 6 (%).
6: Breadth: relative to article 5; wider, equally wide, narrower.

Shape: ovate, pyriform, quadrangular, rectangular, linearly rectangular, styliform.

Palm: Present, absent, undecided.

Slope: transverse, oblique: slight; moderate; extreme.

Chela if present: parachelate (describe if strongly chelate).

Definition of proximoposterior corner of palm: spines, protuberance, tooth, change in slope only.

Ornamentation: special spines, teeth.

7: Fit of the dactyl to palm: congruent, overlapping, not fitting.

Shape and ornaments: claw-like (normal); vestigial; absent (rare); with special setae or spines; hidden in setae or cirri; flagelliform.

Distal articles especially scaly or with small stiff setae (Lysianassidae).

GNATHOPOD 2

Articles:

3: Length normal; elongate (Fig.93E).
4: Merochelation: with strong thumb-like extension.
5: Length relative to article 6 (%).

Posterior lobe: present, weak, absent.

Carpochelation: with strong distoposterior tooth or teeth forming thumb or guarding article 6.

6: Breadth: relative to article 5; wider, equally wide, narrower.

Shape: ovate, pyriform, quadrangular, rectangular, linearly rectangular, styliform.

Palm: Present, absent, undecided.

Slope: transverse, oblique: slight; moderate; extreme.

Chela if present: parachelate (describe if strongly chelate).

Definition of proximoposterior corner of palm: spines, protuberance, tooth, change in slope only.

Ornamentation: special spines, teeth.

7: Fit of this dactyl to palm: congruent, overlapping, not fitting.

Shape and ornaments: claw-like (normal); vestigial; absent (rare); with special setae, spines, or processes.

Sexual dimorphism in female: gnathopod 2 like male but much smaller, like gnathopod 1 and of similar size, like gnathopod 1 but larger.

Pereopods 3-4

Internal glands present or absent.

Orientation of pereopod 4 like that of pereopod 3 (Eohaustorius).

Chelate or prehensile.

Articles 4-5, 4-6, or 4, 5, 6 inflated strongly (rare).

Article 4 extraordinarily elongate (Ampheliscidae, Hyperiopsidae).

Special spines on article 6 near claw: spines striate, hooked.

Article 7 absent (Haustoriidae).

Pereopods 5-7

Relative lengths: pereopod 3 (%); 4=100%; 5=( %).

General structure:

All similar in structure and slightly longer successively (normal).

Article 2 expanded: pereopod 5 ( ), 6 ( ), 7 ( ).

Expanded lobe of article 2 of pereopod 7 different from pereopods 5 and 6.

Chelate, subchelate, or prehensile: pereopods 5, 6, 7.

Fossorial setation (see glossary) present, absent.

Article 7 absent (Haustoriidae, Stegocephalidae): pereopods 5, 6, 7.

Pereopod 7 reduced to fewer than 6 articles.

Pleopods

(Rarely significant in marine Gammaridea [but see Phliantidae especially]).

Relative length (size) of each pair: 1=100%; 2=( %); 3=( %).

Width of peduncle in relation to length (%).

Length of longest ramus relative to peduncle ( %).

Length of inner ramus to outer (%); note absence of rami or low number of articles.

Shape of coupling hooks on peduncle: presence of accessory simple spines near coupling hooks.

Lobation of peduncles.

Uropods 1 and 2

Absence (rare) or presence.

Projection along following uropods. (Percentages often exceeding 100 %.)

Uropod 1 reaching ( %) along uropod 2; ( %) along uropod 3.

Uropod 2 reaching ( %) along uropod 3.

Relative length of rami: outer or inner shortened (occasional), inner absent or vestigial (rare).

Spination density of peduncle and rami (usually of specific value only).

Incision of inner ramus (example Anonyx).
UROPOD 3

Absence (rare) or presence.

Rami absent (rare).

Length relative to other uropods; extension beyond longest of other uropods ( % of its own length).

Length of peduncle relative to urosomite 3 ( %), to peduncles of other uropods ( % of peduncle of uropod 1), or to telson ( %).

Length of longest ramus relative to peduncle ( %).

Length of inner ramus to outer ( %).

Shape of rami: styliform, lanceolate, barrel-shaped, foliaceous.

Articles of outer rami (1 or 2); Ratio of article 2 length to article 1 ( : ).

Minute ornamentation and hooks on rami (especially Ischyroceridae and Ampithoidae).

Special peduncular processes.

TELSON

Absence (rare) or presence.

Fused to urosomite 3 (rare).

APPENDIX III

Glossary of Special Terms

accessory flagellum. The secondary ramus of antenna 1, often absent or vestigial (Fig.1), and attached medially to peduncular article 3.

ad. A suffix added to a word to indicate motion towards. For example, apical refers to description of a condition that is accentuated towards the apex; also used as 'distad, basad'.

aequiramous. Uropod 3 with equal rami. (Fig.19, r3.)

aesthetasc, aesthete. Sensory setae of antennae, flattened and nontapering.

arctic. North polar waters of -1.75 to 4° for 9 months a year.

article. The segment of an appendage (Fig.1). See Segment.

aultral. Southern waters of 4-10°C for 9 months a year.

balker lobe. An accessory lobe at the base of a maxilla or maxilliped.

beveled. The slant or slope of a line when not at right angles with another. Referring to the apex of mandibular palp article 3 which when truncated diagonally or the anteroverentral corners of coxae which are lopped off.

boreal. Northern waters of 4-10°C for 9 months a year.

button comb. A seta or setule modified into a plaque with fringe.

calceolus. A small globular, linguiform or helmet-shaped, articulate sense organ on the antenna; of rare occurrence in marine Gammaridea and most often seen in Eusiridae and Lysianassidae (Fig.19 calc). See Lincoln & Hurley (1981) for 9 kinds.

callynophore. Partially or completely fused proximal articles of primary flagellum on antenna 1 which bear transverse rows of aesthetascs usually grouped together into one or two longitudinal fields to form a brush. (Lowry, 1986).

(carpochelate. Immovable finger of prehensile appendage occurring on carpus (article 5), examples: Lencother, Microduetopus. (Fig.83A.)

carpus. Article 5 of a thoracic appendage (gastropod, pereopod). In the vernacular known as 'foot cheek'. The lateral side of the head below the eye or ocular lobe and above the mandible, especially projecting in Urothoidae. (Fig.83D,F.)

chela. Immovable finger of prehensile appendage.

chelate. Descriptive of the palm of a gnathopod protruding as an immovable finger on which the dactyl closes (Fig.92G,F,M). See para-, carpo-, propo-, propochelate, mero-, cheleate, clava-, claviform. Club-shaped. A part of an appendage such as article 3 of mandibular palp or an aesthetasc with swelling towards apex along linear axis from middle of part. (Fig.39B,E.)

claw, claw-like. Descriptive of a talon or simple tapering nail. [Not descriptive of chelae as used in decapod terminology.]

compressed, flattened from side to side.

conical mouthparts. From lateral view mouthpart field (enclosed by prebuccal mass anteriorly and maxillipeds posterovertically) grouped with ventral margin of maxillipeds forming tangential line at angle to anterior margin of prebuccal mass of significantly less than 90° (Fig.9, Stegocephalidae, h). Uncommon; confined principally to Lphememidae and few genera of such families as Lysianassidae, Paralysidae, Stegocephalidae. (Fig.75B.) See Quadrant mouthparts.

corneal lens. A biconvex cuticular body occurring directly in or on the cephalic cuticle (particularly in Ampeliscidae);
contrasted with subcuticular ommatidia. (Fig.22C,F.) See cuticular lens.

costa, coxal plate. [Terms used synonymously herein.] Article 1 of a pereonal appendage; expanded into a lateral lamella (Fig.1). [Terms for other articles of the appendages such as basis, ischiurn, merus, carpus, propodus, and dactyl are frequently but not universally used in Gammaridae; instead, the articles are simply numbered.]
cuticular lens. A brightly shining circular or oval thickening of the cuticle on the head; one assumes the lens focuses light on the brain or pigment surrounding parts of the brain; common in Ampeliscidae, very rare in Lysianassidae. See corneal lens.
dactyl. Talon-like terminal article of pereopods (article 7) or maxillipeds (articles 3 or 4).
degraded. Severely reduced or with loss of normal structure.
dentate. A margin with tooth-like projections.
depressed. Flattened dorsoventrally.
dispariramous. Uropod 3 with rami unequal either in length, shape or armament. (Fig.16 r3 upper right.)
dominant. Used herein to denote conditions opposite to ‘inferior’ (q.v.); used especially where a morphological part is larger or more setose than comparative parts.
elongate urosomite 1. Five times as long as urosomite 2 and in most species concerned (such as Podoceridae and Iciliidae) at least slightly longer than pleonite 3 (exceptions however do occur). (Fig.118.)
emarginate. Descriptive of the concave posterior end of an unclenched telson (Fig.62P).
entire. Descriptive of an unclenched telson (Fig.62K).
epimeron. A lateral pleuron of pleonites 1-3; the ventrolateral plate-like extension of the body segment (Fig.1). epistome. The anterior surface of the head above the labrum; this area is often extended ventrally to appear as a part of the labrum and may be anteriorly produced as a cusp or lobe (Fig.108J).
eusirid gnathopods. Carpus very narrow, with propodus attached on very narrow margin and thus propodus strongly flexible relative to axis of carpus. (Fig.63C.)
fauna. The composite of species of Amphipoda in a locality, zone or region.
flagellate. Becoming attenuate or extended into thin whip-like apex.
flagellum. The distal part of either antenna 1 or 2; on antenna 1 it commences with article 4, on antenna 2 with article 6; because basal peduncular articles of antenna 2 are often difficult to resolve, the juncture may be recognised between the elongated final peduncular article and the shortened first flagellar article which is followed by similar short articles; on antenna 2, however, article 1 of the flagellum is occasionally elongate and apparently composed of non-segregated (thus conjoint) daughter articles (Fig.1).
foliaceous. Broadened, leaf-like; applied especially to plates or lobes of mouthparts and rami of uropod 3. (Fig.19 r3 upper right.)
fossorial. Associated with the habit of burrowing, often referring to the excessively spinose or setose condition of appendages used for burrowing by Gammaridae; especially applicable to Haustorioidae, Gecarcinocidae, and Phoxocephalidae, with some setae of articles 4-6 of pereopods 5-7 more than half as long as those articles; and some spines in groups forming substantial submarginal or fully facial rows perpendicular to margins; long setae also occur on ‘filter’ feeders such as Ampeliscidae. (Fig.67A.)
galeate. Descriptive of the helmet-shaped heads of various oecdicerotids and synopiids. (Figs 99, 129.)
Gammarida. A classificatory ‘section’ between subborder and superfamily. The derivative noun is gammaridan.
Gammaridae. A family. The derivative noun is gammarid.
Gammaridea. A suborder. The derivative noun is gammaridean.
gamopod. A gnathopod; referring to the use of gnathopods for grasping members of the opposite sex during amplexus.
geniculate. Permanently bent, usually in reference to the flexed antennae of some haustoriids, or the outer lobes of maxilla 2 in some stegocopephilids in which the bend occurs between articles; or applicable to bent palps of maxilla 1 in Hyperosiidae in which the bend occurs on one article. (Fig.67F.)
gnathopod. One member of the first two pairs of free thoracic appendages; these appendages differ in function and usually in appearance from following pereopods; often called pereopods. (Fig.1.)
hand. Article 6 or propodus of a gnathopod or pereopod.
head subglobal. A cube with rounded edges approaching the form of a sphere. (Fig.2 lower left ‘global’.)
insecor. The anterior apical part of the mandible usually formed into a toothed chewing edge or untoothed chopping plate.
inferior. Applicable to various comparisons between morphological parts which have 2 or more kinds of substrates; for example, a pereopod may be smaller than another, in which case the term ‘smaller’ applies; a pereopod may be less setose than another, in which case ‘more sparsely setose’ applies; if a pereopod is both smaller and more sparsely setose than another, the shorthand term ‘inferior’ applies. The opposite of inferior is often ‘superior’ but we prefer to use the term ‘dominant.’
jizz. The combination of ill-defined descriptive elements which allows a subjective impression to be formed of proportions and shape as well as positions or stance of the object. A term now widely used in avian identification and applicable to any group. See P. Harrison, 1983: Seabirds. Boston: Houghton Mifflin.
joint. The juncture between two articles of an appendage. labrum. (See upper lip).
lacinia mobilis. An articulated accessory plate proximal to the mandibular incisor; often absent or missing on either left or right mandibles, occasionally indistinguishable from a spine of the spine-row.
lanceolate. Shaped like a lance; narrow but tapering apicad, occasionally tapering basad.
lateral shield. The combination of coxae and articular expansion of pereopods to form a broad flat side plate.
lower lip (labium). A fleshy complex posterior to the mandibles, always composed of at least one pair of lobes (outer), often with a mediolateral pair of inner lobes; the lateroproximal ends of the outer lobes are often attenuated as aale and are denoted as mandibular lobes. (Fig.1.)
mandible. The anterior movable appendage of the buccal group; usually composed of a body bearing a distal incisor, a lacinia mobilis, spine row, molar, and 3-articulate palp. (Fig.1.)
mandibular setae A-E. On article 3 of the mandibular palp: A, placed dorsolaterally; B, placed dorsomedially; C, subsidiary row of setae mixed into D-setae; D, the principal setae of ventral margin; E, placed apically.
massive. A term applied to the heads of Synopidae and
Oedicerotidae; head as long as pereonites 1-3 combined and as tall as or taller than long (length not including rostrum). Heads of Ampeliscidae, Phoxocephalidae, and the 'shark-nosed' Platychitoniacea are elongate but not massive; heads of Iphimehdidae are as tall as long but are not as long as pereonites 1-3 combined. (Figs 99, 129.)

maxilla 1. A pair of cephalic appendages posterior to the lower lip; for taxonomic purposes only three parts of each member are named: the medial lobe (plate) usually bearing marginal setae, the lateral and larger lobe (plate) bearing terminal spines, and, attached to the outer lobe, a palp usually composed of two articles but occasionally absent. (Fig.1.)

maxilla 2. A pair of cephalic appendages posterior to maxilla 1; for taxonomic purposes each member recognised as a pair of lobes (plates) medial and lateral, usually strongly setose. (Fig.1.)

maxillipeds. The posteriormost pair of 'cephalic' appendages, representing the primitive first thoracic segment now amalgamated with the head but in amphipod taxonomy not included in the sequential numbering of thoracic appendages; for taxonomic purposes recognised as a pair of basally amalgamated appendages, each member composed of a proximal (inner) plate, a distal (outer) plate, and a palp of four articles, rarely reduced to 3 or 2 articles or absent. (Fig.1.)

merochelate. Immovable freely projecting finger of prehensile appendage occurring on merus (article 4); example: gnathopod 1 of Aora. Projection along face of carpus disregarded. (Fig.45H.)

merus. Article 4 of a thoracic appendage (gnathopod, pereopod).

merosomial. Merus extended or swollen unnaturally but not produced into a tooth.

mesosome. The pereon or thorax. [Term rarely used.]

molar. A process of the mandible, located on the midmedial margin; when typically developed it is a medium-sized, subcylindrical body with a surface of ridges and teeth used for grinding (triturative) (Fig.1). It evolves in 2 directions: becoming larger, less triturative and finally smooth and pubescent; becoming smaller, less triturative and finally smooth or pubescent or spinny and finally disappearing.

notched lower lip. Indentation or hollow on anterior margin of primary lobe on lower lip. (Fig.26A.)

obsolescent. Vestigial or nearly absent; sometimes used erroneously for rudimentary conditions.

ommatidium (singular), ommatidia (plural), ommatidial (adjective). Terms applying to the parts of the subintegumentary compound eye, not to be confused with the corneal lenses on the integument of Ampeliscidae.

palm. A posterior surface or margin of article 6 of a gnathopod or pereopod on which article 7 (dactyl) closes for the purpose of prehension; usually recognised because of expansion of article 6 or by occurrence of special spines or ornamentation and usually with a proximal defining limit marked by a change in marginal slope or occurrence of special spines.

palp. Pleonites. Terminal articles of a buccal appendage, in Amphipoda occurring only on mandibles, first maxillae, and maxillipeds as the stenopodous terminal articles distal to the expanded outer plates or main body.

parachelate. A rarely used term in Amphipoda applied to propodochelate gnathopods and pereopods in which the immovable finger is distinct, but article 6 is otherwise unexpanded or nonpalmate; occasionally, the dactyl strongly overlaps the apex of the immovable finger; gnathopods of various Euphimphiliidae are good examples but the term may also be applied to numerous other cases, such as those linear, chelate gnathopods of Sebidae, Didymacantha and various second gnathopods of Lysianassidae (Fig.17B, C).

parvimanus. Pereopod 1 with scale-like inner ramus shorter than one third of outer ramus (Fig.18A, B, upper right).

peduncle. The basal articles of a fundamentally biramous appendage; in Amphipoda applied to antennae, pleopods, and uropods; antenna 1 with three peduncular articles, antenna 2 with five peduncular articles (but appendage not biramous); pleopods with one definitive peduncular article but remnants of others occurring terminally; uropods each with one peduncular article (Fig.1).

pelagon. Referring to the condition of coxa 1 being more dominant or larger than coxa 2. (Fig.10H.)

pereon. The complex of seven free thoracic segments bearing gnathopods and pereopods, not including the maxillipeds (Fig.1).

pereomite. A segment of the pereon.

pereopod. A walking, grasping, standing or feeding appendage attached to a pereomite; normally composed of seven articles, including coxa; in Amphipoda the first two pairs are often termed gnathopods and only the last two pairs of thoracic legs are called pereopods. (Fig.12.)

phoxocephalid form of pereopod / Article 1 of pereopod 7 very broadly expanded generally in form of a shield, remainder of appendage thin and short (Fig.10/3, A, H). Coincidentally, pereopod 7 also much shorter than pereopod 6.

plate. A flattened lobe on an article of a maxilla or maxilliped. pleopod. A biramous swimming appendage on pleonites 1-3, one pair for each pleomite (Fig.1)

pleon. The abdomen (of six free segments in Gammaridean, rarely with some segments coalesced). See mesosome and urosome.

pleonite. A segment of the pleon.

plesurae. Lateral extensions of segments; most amphipods have these on pleonites 1-3 and they are called 'epimera' but the Termophiliidae and a few Eucyclozetidae have extended pleurae recognised by the gaps between segments dorsal to the coxae.

plusetia and plusetule. A plumose seta or setule of prebuccal complex, the labrum and epistome together.

prehensile. Adapted for seizing or grasping, applicable to but rarely used for gammaridean pereopods, especially useful in denoting pereopods of eucyclozetids, Iphimedeida, Pleonectidae, etc., which either are subchelate or chelate, or have distinct, spinose palms or notched surfaces indicating their use in grasping. 'Scarce' prehensile is a subjective opinion that a weak degree of prehensility is present.

propodochelate. Synonymous with chelate (Fig.18K.)

propodus. Article 6 of a thoracic appendage (especially used to denote the palmar article of a gnathopod).

pubescent. Furnished with elongate, hair-like extensions sufficiently dense to be noticeable as a taxonomic feature. 'Hairy' is a misuse of this condition. Sometimes misapplied to clusters of aesthetes.

quadrate mouthparts. See comical mouthparts; mouthpart field arranged in bundle with angle between anterior margin of prebuccal parts and tangent of maxillipodal palp close to 90° so that mouthparts form square or rectangular box.

raker or raker spine. Spines in the spine row between lacinia mobilis and molar of mandible.
scale, scale-like. Terms applied to the accessory flagellum when forming a small lamella immovably fused to article 3 of antenna 1; and to the inner ramus of uropod 3 when strongly reduced and plate-like.

scaled, scaly. Supplied with thin, flat, chitinous plates of microscopic dimension; used here mostly for gnathopod 2 of Lysianassidae and maxillae of Hyperiopodidae. See Pubescent.

segment. Compartmentalised division of the body or soma.

Often misapplied to a division of an appendage; the preferred word for a division of an appendage is 'article'.

seta. A bristle; a weakly articulate chitinous extension supplied with nerve canal; in amphipods word restricted to such projections which are flexible. See Spine.

shield-shaped. Referring to expanded, usually irregular shape of article 2 on pereopod 7. Not smoothly ovate. Or, bearing a large ventral lobe projecting below the root articulation of article 2. (Figs 107A, 129B.)

simple. Used in amphipod taxonomy to denote the absence of spines or setae on appendages; or the occurrence of but a single article in the ramus of a uropod; or especially to the absence of a palm on a gnathopod or pereopod.

Distinction between subchelate and simple is often weak. To the absence of a palm on a gnathopod or pereopod.

spine. A thick inflexible seta. Not used in amphipods in same way as in Decapoda where spine refers to what is called tooth or denticle in amphipods.

splayed. Descriptive of the lateral spreading of coxae, especially in Philantidae. (Fig.105A, bottom right.)

subchelate. Article 6 of a gnathopod or pereopod having a flexible articulation of article 5 or carpus of a gnathopod or pereopod against which article 7 closes; a prehensile condition in which the palm is not produced to form a finger; intermediate in condition between chelate and simple.

Often marked by presence of defining spine or tooth at proximal end of palm. Complexly subchelate or complexly chelate are terms referring to the formation of a false chela by protrusion of teeth, cusps, or lobes from articles other than the sixth and upon which article 7 impinges to form prehensile condition; occurring especially in Aoridae, Corophiidae, and Leuconthoidae (Fig.1). See 'simple'.

telson. A flap dorsal to the anus attached to pleonite 6, primitively biloculate in our concept of the basic amphipod, but usually in Amphipoda with bases coalesced and often with lobes completely coalesced to form a single plate. (Fig.1.)

tooth. A non-articulated extension of a margin. Plural = 'teeth'. Often misapplied to tooth-like spines.

tributurative. Descriptive of the rasp-like surface of a mandibular molar, composed of teeth, ridges, and cusps.

torrid. See tropical.

triturative. Descriptive of the rasp-like surface of a mandibular molar, composed of teeth, ridges, and cusps.

upper lip (labrum). A fleshy lobe attached to the anterior cephalic margin in front of the mandibles; occasionally the anterior surface of the labrum protrudes as a lobe or cusp; often the cephalic area to which the labrum is attached is recognizable as an 'epistome' and may also be lobed; or both labrum and epistome may be indistinguishable and produced together as a single lobe. (Fig.1.)

uropod. One member of the three pairs of terminal pleonal appendages, each formed of a peduncle and two rami (Fig.1) (occasionally rami of uropod 3 reduced or absent, rarely rami of uropods 1-2 absent or reduced).

urosome. The complex of pleonites 4, 5, 6, carrying uropods, and telson. Often numbered as urosomites 1, 2, 3 (Fig.1).

variramous. Uropod 3 with inner ramus shorter than outer but longer than one third; both rami differ in setation pattern; this condition more precisely defined than 'dispariramous'. (Fig.18, second from upper right.)

warm-temperate. Waters in northern and southern hemispheres of 10-20°C for 9 months a year.

wrist. Article 5 or carpus of a gnathopod or pereopod.

APPENDIX IV

The Geographic Reporting System

Barnard & Barnard (1983) devised a coded geographic system that reports distributions of taxa by three digit numbers similar to a library Dewey decimal system. The similarity lies in the ability to decipher inherent geographic information from the numbers assigned, knowing that groups of numbers have certain similarities. Numbers ending in zeros or fives usually refer to large geographic areas, while numbers ending in other digits usually refer to small areas. For example, numbers in the 300's refer to warm-temperate zones in the northern hemisphere, the number 330 referring to a large area (warm eastern Atlantic Ocean) with 340 referring to the Mediterranean Sea in general, 344 to the Moroccan subdivision of the Mediterranean; 350 to the eastern Atlantic in general, 353 to the Biscayan province (or subdivision) and 357 specifically to the islands of Madeira. Marine numbers are explained in the list to follow and refer to maps 1-7. All are benthic unless annotated by letters.

Certain numbers are accompanied by letters explained in the list to follow. These refer to ecological positions of species not otherwise benthic or fully marine, for example

F indicating freshwater and K indicating cobble-brackish or beach interstitial.

Coastal zones include depths of 0-200 m and therefore lack notation; records deeper than 200 m, even though close to the coast, are placed in the larger nearby rectangular oceanic quadrants and the notations B (201-2000 m) or A (2001+ m) are added. Sometimes 'B' is added to coastal zones with fjords deeper than 200 m; sometimes oceanic grid numbers (such as 304) have notations such as 'N' which indicates a non-benthic record; otherwise all numbers refer to the benthos. Oceanic quadrants represent the low numbers in each hundreds-series and are recognised in the list by their extensive positional definitions.

The system and reporting desiderata were designed with several protocols and the reader may find those in Barnard & Barnard (1983: 181-183).

Oceanic quadrants and many of the geographic areas have been given names, based on some feature included in the area. These names have no formal status outside this system. The 200 m line indicating coastal zone boundaries has been exaggerated on the maps.
GEOGRAPHIC NUMBERS

000-199 Northern hemisphere freshwater, terrestrial, continental or insular; not listed herein
200-299 Arctic-boreal marine
300-399 North warm-temperate marine
400-499 Tropical Atlantic marine
500-599 Tropical Pacific marine
600-699 Indo-Pacific marine (mostly Indian Ocean)
700-799 South warm-temperate marine
800-899 Antarctic-austral marine
900-999 Southern hemisphere freshwater, terrestrial, continental or insular; not listed herein

(Individual numbers of the marine zones are elaborated below).

LETTERS

A, abyssal, 2000+ m depth in the sea; B, bathyal, 200-2000 m in the sea; C, cave(s); D, continental salt water; brine; E, estuarine or brackish; F, fresh water; G, epigean; H, hypogean, phreatic, stygian, subterranean; I, inquilinous, commensal, parasitic (general and prehensile pereopods presumed); J, wells; K, cobble-brackish seashore or beach interstitial; L, lakes; M, sublittoral; N, interstitial; O, widespread, meaning extended outward from cited category; P, intertidal; Q, sublittoral, or pelagic (often combined with A or B or M); R, interstitial, Q, anchialine; V, W, widespread, meaning extended outward from cited category; X, brackish, more restricted than category E; Y, interstitial, or pelagic, or pelagic parasitic (general and prehensile pereopods presumed); Z, sea grotto.

Area descriptions enclosed in brackets are group categories not necessarily shown on maps.

200 [Arctic-Boreal marine] a = American (= East Pacific & West Atlantic), s = Asian, e = European
201 [Polar Basin, north of 85°N at all depths]
202 Greenland quadrant: 75-85°N, 400E-200W, 200+ m
203 Baffin quadrant: 75-85°N, 20-030W, 200+ m
204 Canadian quadrant: 75-85°N, 80-140°W, 200+ m
205 Fletchers quadrant: 75-85°N, 140°W westward to 160°E, 200+ m
206 Siberian quadrant: north Asia coast to 85°N, 160-100°E, 200+ m
207 Russian quadrant: 75-85°N, 100-40°E, 200+ m
208 Mohs quadrant: 65-75°N, 0-30°W, 200+ m
209 Thomson quadrant: 60-65°N, 0-45°W, 200+ m
210 [Pan Boreal]
211 Scoresby quadrant: 60-65°N, 45-65°W, 200+ m
212 Davis quadrant: 65-85°N, 50-80°W, 200+ m
213 Beaufort quadrant: 65-75°N, 120-160°W, 200+ m
214 Chukchi quadrant: 65-75°N, 160°W-160°E, 200+ m
215 [West Atlantic and East Pacific boreal together]
216 [Cold North Atlantic and Arctic together]
217 Kara quadrant: 65-75°N, 90-40°E, 200+ m
218 Scandia quadrant: 60-75°N, 40°E-0°, 200+ m
219 North Sea quadrant: 0° eastward, 60°N southward, 200+ m
220 [Arctic Basin in general]
221 Iceland quadrant: 45-60°N, 0-15°W, 200+ m
222 Reykjanes quadrant: 45-60°N, 15-30°W, 200+ m
223 Canyon quadrant: 45-60°N, 30-45°W, 200+ m
224 Newfoundland quadrant: 45-60°N, 45-60°W, 200+ m
225 Juneau quadrant: 45-60°N, 120-150°W, 200+ m
226 Kodiak quadrant: 45-60°N, 150-165°W, 200+ m
227 Hering quadrant: 60-65°N, 160-180°W, 200+ m
228 Unalaska quadrant: 45-60°N, 165°W 180°, 200+ m
229 Date line quadrant: 45-60°N, 180° 180° E, 200+ m
230 [Boreal Pacific]
231 Petrovskovsky quadrant: 45-60°N, 160°E west to Kuril Islands, 200+ m
232 Aleksandrovsk quadrant: 45-60°N, about 150°E; but inside Kuril Islands chain only, 200+ m
233 [Boreal Inland Seas and glacial relics]
234 Gulf of Bothnia, Baltic Sea
235 Baltic Sea, including Gulf of Finland but excluding Gulf of Bothnia
236 Kattegat
237 Skagerrak and nearby areas to the south
238 Norway, from Vardø to the Skagerrak
239 Britain
240 [Boreal east Atlantic]
241 [Britain in general]
242 English Channel, including Jersey and St. Malo, Guernsey, Plymouth, Isle of Wight, Portsmouth, Dover, Calais, Lands End, Scilly Isles, Finisterre and Ille d’Ouessant (Ushant Island)
243 Shetland Islands
244 Faeroe Islands
245 Iceland north of 65°N
246 Hekla: Iceland south of 65°N
247 Jan Mayen
248 Bear Island
249 Rockall Bank
250 [Amphiboreal Atlantic, west and east]
251 East Greenland, and west Greenland north to Arctic circle 252 [Arctic to Mediterranean in north-eastern Atlantic]
253 Thule: West Greenland, north of Arctic circle
254 Cod: Cape May (northern cape of Delaware Bay, New Jersey) to Cape Sable, Nova Scotia, including Bay of Fundy.
255 Breton: Cape Sable, Nova Scotia, north to Cape Bauld, Newfoundland, not including Gulf of St Lawrence
256 Gaspe: Gulf of St Lawrence
257 Labrador: Cape Bauld, Newfoundland, north to Cape Chidley, Labrador
258 Ungava: Hudson Strait from Cape Chidley west to 75°W, including Ungava Bay
259 Hudson Bay and Foxe Channel
260 [Boreal western Atlantic]
261 Franklin: East Baffin Island and east Devon Island
262 Foxe Basin and Gulf of Boothia
263 McClintock Channel south and west to Coronation Gulf
264 McClure Strait east to Lancaster Sound, including Queen Elizabeth Islands
265 Sverdrup: North-east Ellesmere Island west to Amundsen Gulf
266 Banks: Mouth of Amundsen Gulf east to north-west mouth of Coronation Gulf
267 Barrow: Mouth of Amundsen Gulf west to Bering Strait
268 Oregon: Eureka, California, north to Cape Flattery, Washington
269 Puget Sound, Strait of Juan de Fuca, Strait of Georgia, Queen Charlotte Strait
270 [Boreal eastern Pacific]
271 Vancouver: Oceanic side of Vancouver Island to Port Simpson, British Columbia
272 Sitka: Port Simpson, British Columbia, north to Cook
273 Alaska, from Cape Newenham north to Aleutian: Alaska Peninsula and Aleutian Islands, from
Cook Inlet to Cape Newenham
274 Alaska, from Cape Newenham north to Bering Strait
275 Saint Lawrence Island
276 Saint Matthew Island
277 Pribilof Islands
278 Anadyrski: Siberia, from Bering Strait south to Cape Olyutorskiy
279 Kamchatka Peninsula, from Cape Olyutorsky west around peninsula to Cape Utkholoskiy
280 [Boreal western Pacific]
281 Commander (or Komandorskiy) Islands (also known as Beringa)
282 Shelikov: Shelikova Gulf, from Cape Utkholoskiy west to Cape Tolstoy
283 Okhotsk: From Cape Tolstoy south-west to include Ulbanskiy Bay
284 Eastern Sakhalin
285 Tatar Straits
286 Kurile Islands
287 Northern Siberia from Bering Strait to 160°E
288 Wrangel Island
289 Novosibirskiy Islands (New Siberian Islands)
290 [Northern Siberia]
291 Lyakhovsky: Northern Siberia from 160°E west to Petra Bay, about 113°E
292 Taimyr: From Petra Bay west to Pechorskaya Sea, just south of Novaya Zemlya
293 Revolution: Oktjabrskoy Revolyutsii Ostov and Severnaya Zemlya (October Revolution Island and North Land) and nearby islands
294 Franz Joseph Land
295 Spitsbergen
296 Yeniskeyskiy Zaliv, Gydanskaya Guba and Obskaya Guba (Jenseni, Gydansk and Ob Gulfs)
297 Novaya Zemlya
298 Murmansk: From Pechorskaya Sea west to Vardø, Norway
299 White Sea
300 [Warm temperate marine]
301 Peloponnescus quadrant: Eastern Mediterranean westward to 15°E, 200+ m
302 Tropez quadrant: Western Mediterranean from 15°E westward, 200+ m
303 Portugal quadrant: 30-45°N, 15°W eastward to Gibraltar, 200+ m
304 Lusitania quadrant: 30-45°N, 15-30°W, 200+ m
305 Mid-ocean quadrant: 30-45°N, 30-45°W, 200+ m
306 Grand Banks quadrant: 30-45°N, 45-60°W, 200+ m
307 Hudson quadrant: 30-43°N, 60-75°W, westward to coast, 200+ m
309 Viscaino quadrant: 15-30°N, 120°W eastward to coast, 200+ m
310 California quadrant: 30-45°N, 135°W eastward to coast, 200+ m
311 Clarion quadrant: 15-30°N, 120-135°W, 200+ m
312 Albatross quadrant: 30-45°N, 135-150°W, 200+ m
313 Aztec quadrant: 15-30°N, 135-150°W, 200+ m
314 Murray quadrant: 30-45°N, 150-165°W, 200+ m
315 Pele quadrant: 15-30°N, 150-165°W, 200+ m
316 Seascarp quadrant: 30-45°N, 165-180°W, 200+ m
317 Laysan quadrant: 15-30°N, 180-165°E, 200+ m
318 Pacific quadrant: 15-30°N, 180-165°E, 200+ m
319 Seamount quadrant: 15-30°N, 180-165°E, 200+ m
320 Mellish quadrant: 30-45°N, 165-150°E, 200+ m
321 Necker quadrant: 15-30°N, 165-150°E 200+ m
322 Emperor quadrant: 30-45°N, 150-135°E, to Japan coast, 200+ m
323 Volcano quadrant: 15-30°N, 150-135°E, 200+ m
324 Minami quadrant: 30-45°N, 135-120°E but north and west only to Japan or continent: 200+ m
325 Formosa quadrant: 15-30°N, 135-120°E, 200+ m
326 China quadrant: 25-30°N, 120-105°E but only north and west to China coast, 200+ m
327 [Warm Eastern Atlantic including Mediterranean]
328 Aral sea
329 Caspian Sea
330 Azov Sea
331 Black Sea
332 [Caspian, Black, Azov Seas and their rivers together]
333 [Caspian and Black Seas together]
334 [Rivers or limans of Black and Azov Seas together: Don, Danube, Donets, Dniester Rivers]
335 [Rivers or limans of Caspian Sea; Volga, Ural, Emba Rivers]
336 [Mediterranean and Black Seas together]
337 [Mediterranean Sea in general]
338 Aegean: North-eastern Mediterranean coasts from north-west Peloponnisos east to Mersin, Turkey, including Aegean Sea
339 Cyprus
340 Libyans: Eastern and south-eastern Mediterranean coasts, from Mersin, Turkey, to Marsa Susah, Libya
341 Suez Canal
342 Morocco: Southern Mediterranean coast, from Marsa Susah, Libya to Strait of Gibraltar
343 Adriatic Sea
344 Coasts of Ionian Sea from north-west Peloponnisos to Strait of Messina, eastern and southern Sicily to Marsala, Malta and Pantelleria
345 Sardinia and Corsica
346 Riviera: North-western Mediterranean coast from Marsala, Sicily to Strait of Gibraltar
347 Balearic Islands
348 [Warm eastern Atlantic and Mediterranean and salty Black Seas]
349 [Eastern Atlantic]
350 [Eastern Atlantic]
351 Gibraltar: Cape San Adrída, Spain, south to 31°N, west of Strait of Gibraltar
352 [Warm eastern Atlantic and Mediterranean and salty Black Seas]
353 Biscay: Cape San Adrída, Spain north to English Channel, including Bay of Biscay
354 [Eastern Atlantic warm temperate to boreal]
355 [Species escaped from one river system to another].
356 Madeira
357 [Lusitanian region: Azores, Madeira, Canary Islands to west Iberian Peninsula together]
358 Azores
359 [North-western Atlantic]
360 [Western Atlantic warm temperate to boreal]
361 [Western Atlantic warm temperate to tropical]
362 Chesapeake: Cape May, New Jersey (northern cape of Delaware Bay) south to south side of entrance to Chesapeake Bay
363 [Gulf of Maine southward to south Florida]
364 Carolina: South side of Chesapeake Bay south to Jacksonville, Florida
365 Bermuda
366 [North-eastern Pacific boreal]
367 [Eastern Pacific warm temperate to tropical]
368 [North-eastern Pacific warm temperate]
Johnston Island to Ensenada, Magdalena: West coast of Baja California, from Japan: Eastern coast of Japan, from Nakaminata, Hokkaido south to Nakaminata, Honshu.

Leone quadrant: American continent, Caribbean islands, Vema quadrant: Wake Island, Midway Islands, Hawaiian Islands, Parece Vela, Marcus Island, Revillagigedo Islands.

Canalino: Offshore islands, including Santa Catalina, Mindelo quadrant: Ryukyu Islands, including Okinawa to Chin-hsiang of Lien-yun-kang.

Monterey: Santa Cruz Island south to Point Conception, California, Guinea quadrant: Tortugas, Atlantis quadrant: Romanche quadrant: 0-IS'S, 10km south-east of Lein-yun-kang.

Arguin Bank, South Atlantic; Yellow Sea: from Wando, south-east of Lein-yun-kang south but always south of Tampico, Mexico, including Yucatan Peninsula.

Florida, from Mullet Key, north side of Tampa Bay south, east and north to Jacksonville, Florida, including Florida Keys and Dry Tortugas Islands.

Gulf of Mexico: areas 445, 446, 447 and 449 together; Angola: West African coast from Punta das Palmeirinhas, Angola, south to Swakopmund, Namibia.

Brazil: Cabo Frio north to Ponta do Calcanhar (just north of Natal); Maranhao: Brazil, from Ponta do Calcanhar, north-west to Curuca (north-east of Belém and east of Baía de Marajó).

Surinam: Curuca, Brazil, north-west to Boca Grande (mouth of Orinoco River), Venezuela.

Erland (includes Luanda); Angola: West African coast from Punta das Palmeirinhas, Angola, south to Swakopmund, Namibia.

450 [East South America]; 453 Brazil: Cabo Frio north to Ponta do Calcanhar, north-west to Curuca (north-east of Belém and east of Baía de Marajó).

458 Surinam: Curuca, Brazil, north-west to Boca Grande (mouth of Orinoco River), Venezuela.

460 [Caribbean region]; 462 Bonaire: Mouth of Orinoco River, west to Cabo San Roman, Venezuela, including Aruba, Curaçao and Bonaire.

464 Lago de Maracaibo, Cartagena: Cabo San Roman, Venezuela, including Aruba, Curaçao and Bonaire.

465 Cartagena: Cabo San Roman, Venezuela, including Aruba, Curaçao and Bonaire.

466 Colon: Southern border of Panama north to Trujillo, Honduras (86°W); 469 [Amphi-Atlantic, warm-water].

470 [Tropical West Atlantic]; 471 Yucatan: Trujillo, Honduras north-west to 22°N (just south of Tampico, Mexico, including Yucatan Peninsula.

473 Vera Cruz: Gulf of Mexico from 22°N to mouth of Rio Grande River (Mexico/USA border).

474 Texas: Gulf of Mexico from mouth of Rio Grande River north-east to South Point, Mississippi Delta.

476 Gulf: Gulf of Mexico from South Point, Mississippi Delta, south-east to Mullet Key (north side of Tampa Bay).

478 Florida, from Mullet Key, north side of Tampa Bay south, east and north to Jacksonville, Florida, including Florida Keys and Dry Tortugas Islands.

480 [Gulf of Mexico]; 481 Bahama Islands; 483 Cuba; 484 Cayman Island; 486 Jamaica; 488 Haiti and Dominican Republic (Hispaniola); 489 Puerto Rico and Virgin Islands.

491 Leeward Islands; 500 [Pacific Ocean].
Records of the Australian Museum (1991) Supplement 13 (Part 2)
of Java, Bali, Lombok and surrounding islands, including Borneo east to Tanimbar.

Northern Islands of Moluccas, including Kepulauan Obi and Palau Belitung.

Tongking: From Macau, China, south to Da Nang, Vietnam.

Macao: South-east China, from Chin-hsiang south to Taiwan.

Nan: From Cape Negrais, Burma, west to False Bight, 105-120°W, 200+ m.

Taiwan: Christmas Island.

Macao: South-east China, from Chin-hsiang south to Macau.

Tongking: From Macau, China, south to Da Nang, Vietnam.

Hainan Dao.

Viet Nam, from Da Nang to Gulf of Thailand (Pointe de Cau Mau or Mui Bai Bung).

Siam: Gulf of Thailand, from Mui Bai Bung to border between Thailand and Malaysia near Tumpat.

Malay Peninsula, from Thailand/Malaysia border around into Straits of Malacca to Pelabohan Kelang.

Christmas Island.

Cocos (Keeling) Islands.

Martaban: Western Malay Peninsula, from Pelabohan Kelang north-west to Cape Negrais, Burma (western mouth of the Irrawaddy).

Andaman and Nicobar Islands.

Burma: From Cape Negrais, Burma, west to False Point, India, near Mahanadi River.

Madras: Eastern India from False Point, India, south-west to Cape Comorin (includes Chilka Lake).

Sri Lanka (= Ceylon).

Mysore: Western India, from Cape Comorin north-west to Diu (west side of Gulf of Khambhat).

Maldive and Laccadive Islands.

Chagos Archipelago.

Maldive and Laccadive Islands.

Indus: From Diu, India, north-west to Gwadar, Pakistan.

Oman: From Gwadar, Pakistan, west to Strait of Hormuz and south to Al Hadd, including Gulf of Oman.

Persian (Arabian) Gulf.

Muscat: South Arabian coast from Al Hadd to Sayhut, South Yemen.

Gulf of Aden.

Socotra Island and outliers.

Red Sea.

Moga: From Cape Guardefui at mouth of Gulf of Aden to Mogadishu, Somalia.

East Africa.

Kenya: From Mogadishu, Somalia, south-west to Chale Point, Kenya.

Tanzania: From Chale Point, Kenya, south to 15°S.

[Tropical Indian Ocean and Red Sea]

Mozambique: from 15°S to Ponta da Barra Falsa, Mozambique.

[West Indian Ocean]

Seychelles, Amirante and Curieuse Islands.

Agalega Islands.

Albajda Islands and shallow areas of the Chagos Archipelago.

Comoro Islands, Geyser Bank and Mayotte.

Cargados Islands.

Rodriguez Island.

Mauritius and Reunion Island.

Madagascar.

Bassas da India and Europe Island.

South-west to Point Quobba (north-west of Tasmania).
767 Chiloe: Chile from Cabo de Quedal south to south side of Golfo de Penas
768 Felix: Islas de Los Deventurados (including Felix Island)
769 Juan Fernandez Islands
770 [Australia]
771 Kermadec Islands
772 Chatham Islands
773 Hauraki: North-east side of North Island, New Zealand from North Cape south to Cape Kidnappers
774 Cook: New Zealand, from Cape Kidnappers south to south root of Banks Peninsula, including Cook Strait west to Cape Teraswhiti
775 [New Zealand]
776 Stewart: New Zealand: from south side of Banks Peninsula south-west to Windsor Point (south cape of Southern Island), including Stewart Island; s = The Snares
777 Nelson: Western New Zealand, from south cape of South Island north to Cape Egmont, North Island
779 Auckland: North-west New Zealand from Cape Egmont north to North Cape, North Island, including Three Kings Islands
780 [Southern Australia]
781 Sydney: Eastern Australia, from Port Macquarie south to Cape Howe at New South Wales/Victoria border
782 Victoria: south-eastern Australia from Cape Howe west to Cape Nelson
783 Tasmania and all island outliers (including Hogan Group)
784 [South-east Australia]
785 Adelaide: southern Australia from Cape Nelson west to Cape Wondama (southern cape of Streaky Bay), South Australia
786 Eucla: From Cape Wondama, South Australia, west to Rocky Point (north point of Islaieite Bay), Western Australia
787 Flinders: South-western Australia from Rocky Point, Islaieite Bay, west and north to include Cape Naturaliste
788 Perth: South-western Australia from Cape Naturaliste to Green Head (almost 30ºS)
789 Shark: Western Australia from Green Head north to Point Quobba
790 [Southern warm temperate islands]
791 [East Australia]
792 [West Australia]
793 [Circum-Australia]
794 [South-west Australia]
795 Amsterdam and Saint Paul Islands
797 Crozet Islands
799 Prince Edward and Marion Islands
800 [Antarctic-austral marine]
801 Weddell quadrant: 55-90ºS, 20-60ºW, 200+ m
802 Drake quadrant: 55-90ºS, 60-100ºW, 200+ m
803 Amundsen quadrant: 55-90ºS, 100-140ºW, 200+ m
804 McMurdo quadrant: 55-90ºS, 140-180ºW, 200+ m
805 Adelie quadrant: 55-90ºS, 180-140ºE, 200+ m
806 Wilkes quadrant: 55-90ºS, 140-100ºE, 200+ m
807 Mawson quadrant: 55-90ºS, 100-60ºE, 200+ m
808 Olav quadrant: 55-90ºS, 60-20ºE, 200+ m
809 Maud quadrant: 55-90ºS, 20ºE-20ºW, 200+ m
810 [Austral islands]
811 Merz quadrant: 45-55ºS, 0-30ºW, 200+ m
812 Shag quadrant: 45-55ºS, 30-60ºW, 200+ m
813 Horn quadrant: 45-55ºS, 60-75ºW, 200+ m
814 Mornington quadrant: 45-55ºS, 75-90ºW, 200+ m
815 Menard quadrant: 45-55ºS, 90-120ºW, 200+ m
816 Udintsev quadrant: 45-55ºS, 120-150ºW, 200+ m
817 Maori quadrant: 45-55ºS, 150-180ºW, 200+ m
818 Iselin quadrant: 45-55ºS, 180-150ºE, 200+ m
819 Kangaroo quadrant: 45-55ºS, 150-120ºE, 200+ m
820 Shackleton quadrant: 45-55ºS, 120-90ºE, 200+ m
821 Leopold quadrant: 45-55ºS, 90-60ºE, 200+ m
822 Enderby quadrant: 45-55ºS, 60-30ºE, 200+ m
823 Astrid quadrant: 45-55ºS, 30-0ºE, 200+ m
824 [Antarctica plus Magellanic region of South America]
825 Falkland Islands
826 South Georgia: s = Shag Rocks, w = Burdwood Bank
827 South Sandwich Islands
828 [Circum-austral]
829 South Orkney Islands
830 [Austral islands near New Zealand]
831 Bounty Islands
832 Antipodes Islands
833 Auckland Islands
834 Campbell Island
835 Macquarie Island
836 [New Zealand and all austral islands together]
837 [New Zealand and nearby austral islands together]
838 Kerguelen Islands
839 Heard and McDonald Islands
840 Bouvet Island
841 [Austral South America]
842 Comodoro: Argentina from Puerto Lobos south to Cape Guardian (just south of Deseado)
843 Magellan: Apex of South America between Golfo de Penas, Chile and Cape Guardian, Argentina
844 [Antarctica plus South Georgia]
845 [Austral South America plus Falkland Islands]
846 [Austral South America plus Falkland Islands plus South Georgia]
847 [South Atlantic deep water]
848 [Antarctica]; e = east only
849 South Shetland Islands
850 Palmer: Antarctic Peninsula, from Carroll Inlet (73ºS, 80ºW) east to Cape Fiske (74ºS, 60ºE) including all of peninsula and islands
851 Byrd: Antarctica from Carroll Inlet west to Ruppert Coast (141ºW)
852 [Antarctica and outliers of the Antarctic Archipelago]
853 Ross: Antarctica from Ruppert coast (141ºW) west to Cape Adare (170ºE), including Ross Sea and Ice Shelf
854 Oates: Antarctica from Cape Adare west to Dibble Iceberg Tongue (135ºE, not including Davis Bay just to west), including Hut Point, and winter quarters of “Discovery” Expedition 1902
855 [Antarctica and Austral islands]
856 Shackleton: Antarctica from Dibble Iceberg Tongue (135ºE) west to Cape Darnley (70ºE) (Gauss Station = 66ºS, 89ºE)
857 Enderby: Antarctica from Cape Darnley (70ºE) west to west end of Princess Astrid Coast (5ºE)
858 Coates: Coates Land, Antarctica, from west end of Princess Astrid coast (5ºE) west to Cape Fiske (60ºE)
859 [Antarctic islands]
860 Peter I Island
861 Scott Island
862 Balleny Islands
863 [Magellan to Palmer + outliers]
Map 1. General world geographic zones.
Map 2. Atlantic region geographic zones.
Map 3. Indian Ocean region geographic zones.
Map 4. Western Pacific region geographic zones.
Map 5. Eastern Pacific region geographic zones.
Map 7. South Polar region geographic zones.
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