

A.C. Hay & T. Trnski

D VIII-X, 8-11

A III, 7-9

P₁ 12-16P₂ I, 5

C 17

V 25

Distribution Adults occur in coastal drainages of temperate south-eastern Australia between Tin Can Bay, Qld, (25°55'S) and Gippsland, Vic (147°30'E). They are catadromous, generally inhabiting freshwater rivers, lakes and streams and move to brackish estuaries to spawn during winter. Adults are olive-green to silvery-grey dorsally and paler, yellow to white ventrally. Very similar to *M. colonorum*, except for a snout profile that primarily straight and slightly darker colouration. A popular angling species attaining a maximum size of about 60 cm (Harris & Rowland 1996, Allen *et al.* 2002, Hoese *et al.*, in press).

Diagnostic characters

- Myomeres 10-13 + 13-15 = 25
- Ratio SnL < ED
- Spine on anterior preopercular border
- 2 large expanded melanophores along the dorsal midline of the trunk and tail, with a third developing on the nape by 7.2 mm
- No midlateral series of melanophores
- No pigment line through eye

Description of larvae

Morphology Body depth is elongate in preflexion (BD 15-18%), but becomes moderate by flexion (BD 26-34%) and in postflexion and juveniles (BD 29-35%). Reared postflexion larvae and juveniles are deeper than wild larvae (32-44%) – this is an artefact of the full guts in the reared larvae. Head is moderate to large (HL 22-38%). The snout is shorter than the eye diameter. Eye is moderate to large (ED 27-36% of HL). Small canine teeth appear in both jaws in late preflexion larvae, 4.4 mm. Nasal pit begins to roof over by 8 mm. Head spination is weak. A small spine appears on the posterior preopercular border by late preflexion. By flexion, there are 3 small preopercular spines, with the spine at the angle the longest. In late postflexion (7.5-8.2 mm) 4-5 preopercular spines are present with up to 7 in juveniles. A small interopercular spine develops during flexion. An opercular spine is present from 8.6 mm and a small supracleithral spine is present by settlement. Gut is moderate to long, (PAL 44-56% yolk-sac-preflexion and 54-66% flexion-juvenile), is initially straight in yolk-sac larvae, coils during preflexion and is oval to triangular in shape. The conspicuous gas bladder is moderate to large. Scales have not developed in the largest specimen examined.

Size at

Hatching	3.5 mm
Notochord flexion	4.6–5.9 mm
Settlement mm	10.1-14.1 mm
Formation of fins:	
Caudal	4.6-5.6mm; Dorsal 4.6–5.7 mm; Anal 4.6–13.3 mm; Pectoral 5.7–6.7 mm; Pelvic 6.3–8.2 mm

Pigmentation Larvae are moderately pigmented. *External:* An expanded melanophore is present on the tip of the snout and a small melanophore develops under the tip of the lower jaw prior to flexion. A second melanophore on the snout develops posterior to the first by flexion. A single melanophore is present at the angle of the lower jaw. There is an expanded melanophore on the midline of the isthmus. A series of 3-6 small, expanded melanophores are present along the ventral midline of the gut; in postflexion larvae there is 1 melanophore anterior to the pelvic-fin base, and 2-4 melanophores along the midline of the gut. There are 2 very large, expanded melanophores on the dorsal midline of the tail; the first is on the trunk centred over the hindgut, and the second is mid way along the tail. Another smaller expanded melanophore is present dorsally on the nape above the pectoral-fin base by 7.2-7.5 mm. Two very large expanded melanophores occur ventrally, opposite the 2 large dorsal melanophores. A small contracted melanophore ventrally on the posterior margin of the caudal-fin base develops between 5.0-6.1 mm then expands and spreads across up to four ray bases. Pigment spreads rapidly over much of the head from 7.2 mm, and laterally on trunk and tail from 8.2 mm. After settlement, the expanded melanophores on the dorsal and ventral midlines of the body become relatively smaller and small melanophores cover most of the head and body. *Internal:* A series of melanophores underlie the mid- and hindbrain. Expanded melanophores over the gas bladder may have filaments that emerge externally.

Figure – Larvae and juvenile of *Macquaria novemaculeata*. **A** Late yolk-sac, 10 days PH; note remnant of yolk below pectoral-fin base (I.41561-003). **B** Preflexion (I.41653-001). **C** Flexion (I.41661-002). **D** Postflexion (I.41691-001). **E** Postflexion, 57 days PH (I.41561-007). **F** Settled juvenile (I.20052-012). Specimens A and E reared at PSFC, B-D from Swansea Channel, NSW and F from the Clyde River, NSW. Illustrated by T. Trnski and S. Bullock.

Material Examined The description is based on 38 specimens (wild and reared) of *M. novemaculeata* from 3.3 to 14.1 mm. Wild larvae were collected in a fixed 2 m² channel net in Swansea Channel, Lake Macquarie, and by seine netting in the Clyde River, southern NSW. Reared larvae were obtained from Port Stephens Fisheries Centre (PSFC). AMS I.20052-012 (F), I.27051-013, I.41561-001, -002, -003 (A), -004, -005, -006, -007 (E), -008, I.41590-001, I.41641-001, I.41653-001 (B), I.41661-001 and -002 (C), I.41662-001, I.41668-001, I.41690-001 to -004, I.41691-001 (D), I.41694-001.

Identification justification Wild-caught larvae and juveniles were identified as percichthyids using the characters in Brown and Neira (1998). The larvae and juveniles described here were confirmed as being *Macquaria* because of their coastal distribution and meristic values. The overlap in meristic values between *M. colonorum* and *M. novemaculeata* made separation of the species difficult. The availability of reared *M. novemaculeata* from positively identified adults determined the species allocations based on pigment differences. This description is based on the publication Trnski *et al.* (2005).

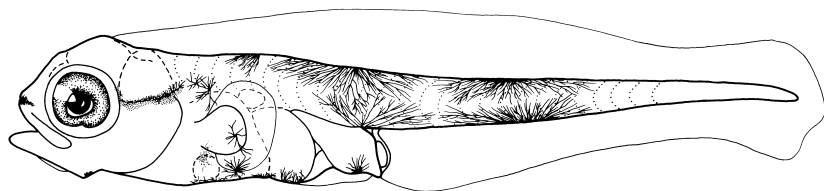
References Allen, G. R., Midgley, S. H. and Allen, M. (2002). Field guide to the freshwater fishes of Australia, 394 pp. Western Australian Museum, Perth.

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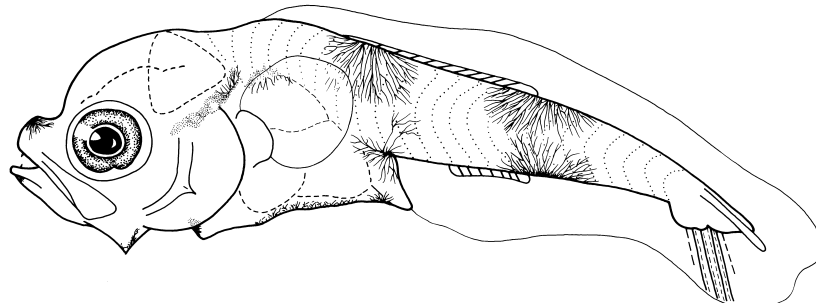
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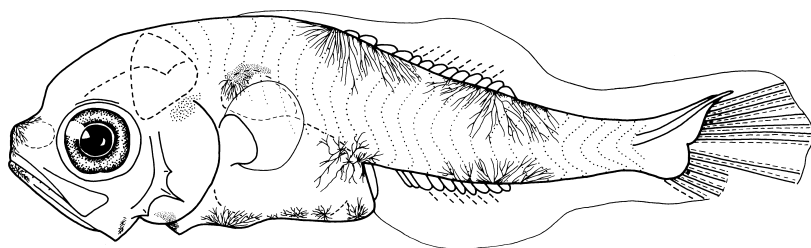
Trnski, T., Hay, A.C. and Fielder, D.S. (2005). Larval development of estuary perch (*Macquaria colonorum*) and Australian bass (*M. novemaculeata*) (Perciformes: Percichthyidae), and comments on their life history. Fishery Bulletin, 103: 183-194.



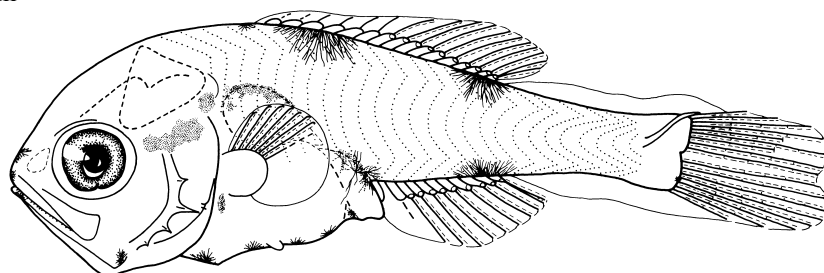
A 4.4mm



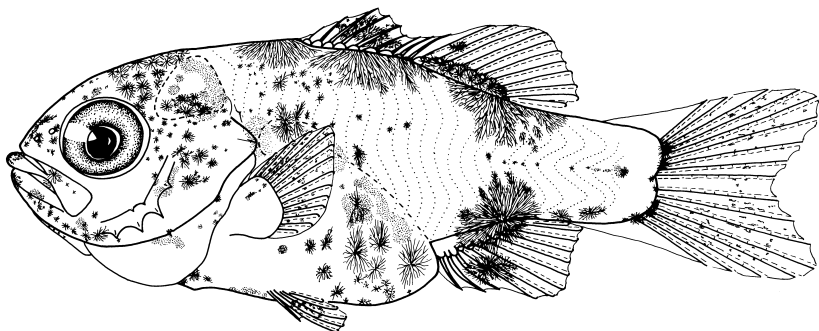
B 4.6 mm



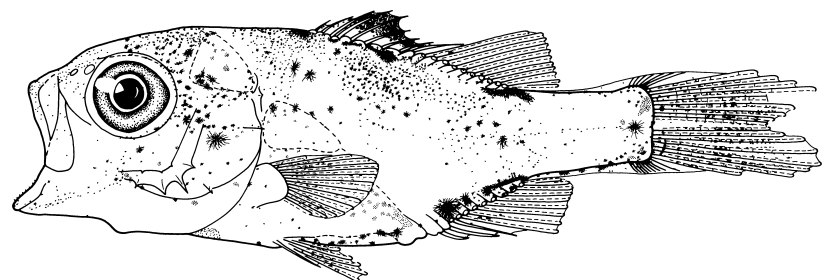
C 5.4 mm



D 6.7mm



E 10.3 mm



F 13.3 mm