

AUSTRALIAN MUSEUM

# AUSTRALIAN MUSEUM RESEARCH INSTITUTE STUDENT FORUM 2015



ABSTRACTS

**AUSTRALIAN MUSEUM**

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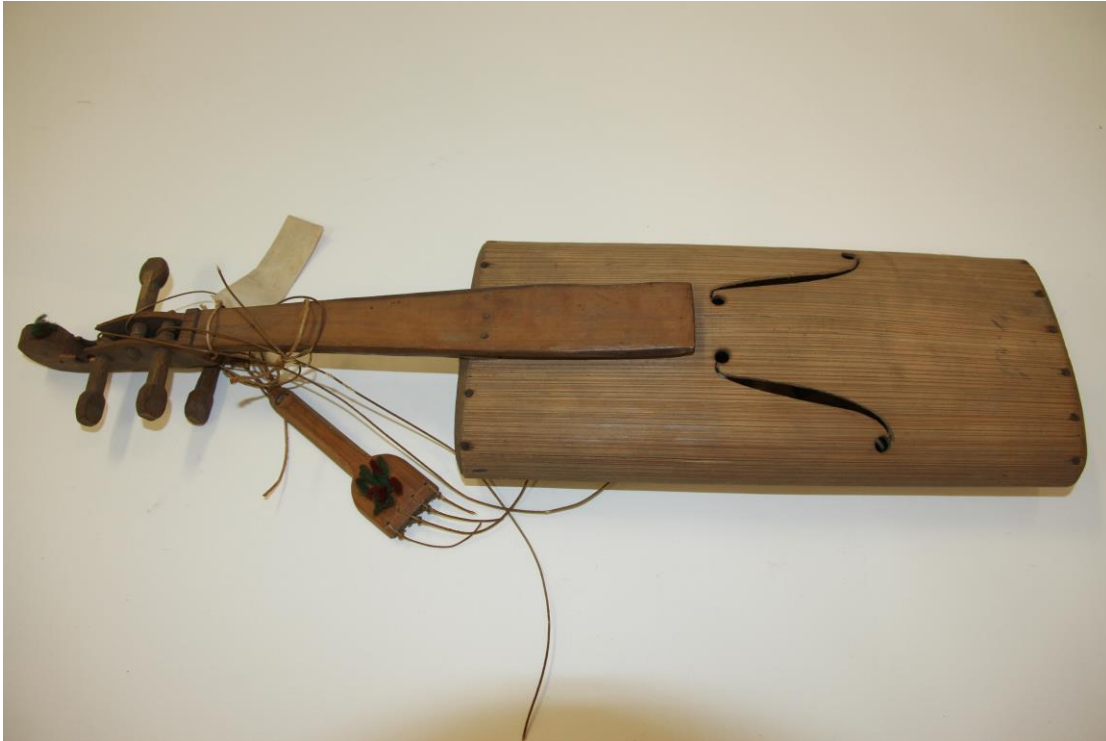
## **VESSELS OF KNOWLEDGE, IDENTITY AND CULTURE:**

### **EXPLORING ABORIGINAL TIED-BARK CANOE-MAKING EXPERIENCES THROUGH YARNING INTERVIEWS**



**Mariko Smith**  
University of Sydney

This presentation highlights my use of a methodologically innovative and culturally-appropriate interviewing technique called “photo-elicitation” in my PhD research on Aboriginal tied-bark canoe making initiatives in south-eastern Australian Aboriginal communities today. Developed in the humanities and social sciences within the sub-disciplines of visual anthropology and visual sociology, photo-elicitation involves the incorporation of photographs and other visual media into one-on-one semi-structured interviews. Photo-elicitation is a collaborative way to generate knowledge. According to a leading visual sociologist, Douglas Harper, ‘The PE (photo elicitation) interview radically redefines the sociological interview because it centres on objects in a photo that both parties are looking at and trying to make sense of’ (2012, p. 157). My research pushes this technique further to ‘sensory elicitation’ – using other media, e.g. natural materials like bark and model canoes alongside photographs, to specifically focus on sensory perceptions and experiences. This presentation expands upon documentary photographs taken of a Dharawal/Yuin (NSW South Coast) canoe-making event in August 2014. The tied-bark canoe was commissioned by the Australian Museum for its *Garrigarrang: Sea Country* exhibition.



## **CHORDOPHONES OF THE PHILIPPINES - CAN MUSIC HELP US TRACE HISTORICAL CULTURAL INTERACTIONS?**

**Vickie Tran**

University of Sydney

Music and musical instruments have the opportunity to reflect the culture from which they derive, but can they also be utilised as markers of cultural exchange? By focusing on the Australian Museum's collection of Philippine instruments, my research has been focused around the Philippine's historical interactions with European countries, mainly Spain and elsewhere in Asia. These instruments, four chordophones (stringed-instruments), can arguably represent the historical influences of one culture upon another through the medium of musical production and practices.

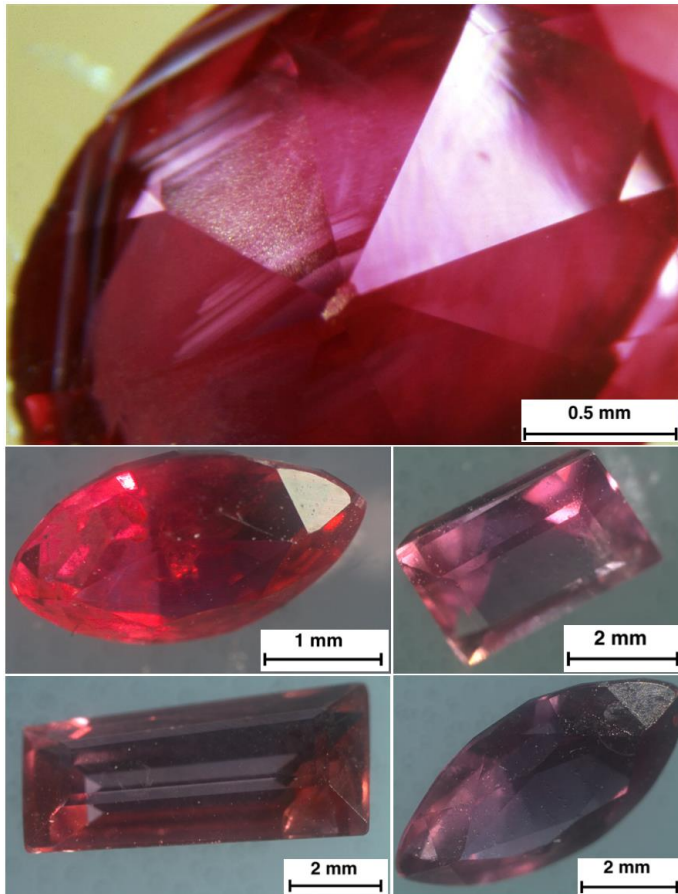


Leura Falls pic is taken by Amy St Lawrence of Blue Mountains City Council

## **PATHWAYS FOR MUSEUMS TO COMMUNITY ENGAGEMENT THROUGH CITIZEN SCIENCE: EXAMINING THE EXPERIENCES OF STREAMWATCH**

**Ellie Downing**  
Macquarie University

Citizen science programs can be an invaluable source of baseline data for scientists and a great way to re-establish museums as centres of research. But there is more to be gained from citizen science than data. Frameworks for citizen science within museums need to be re-considered so that the programs can function both as a source of data and a valuable museum program for engagement and dialogue. Citizen science should be part of the life of a museum, not just a product of it. Research using the Streamwatch program as a case study is exploring participant experiences within the museum space in order to contribute to discussions of best practice for museums engaging in citizen science.



## UNUSUAL RUBIES FROM THE NEW ENGLAND BASALTIC GEMFIELDS

**Stephen Harris**

University of New South Wales

Rubies and sapphires are gem corundum ( $\text{Al}_2\text{O}_3$ ) varieties coloured by trace amounts of transition elements such as Cr, Fe, Mg, Ti and V. Fifteen rubies from the New England district in NSW, including a 2.31 carat cut stone from the Australian Museum, have been analysed for their trace element composition using laser ablation inductively coupled plasma mass spectrometry (LA-ICP-MS). Diagnostic genetic ratios, such as Fe/Mg and Ga/Mg, highlight that the rubies were crystallised from a magmatic source. Interestingly, the rubies contain elevated amounts of Ga, unusual for magmatic rubies as well as typical corundum sourced from the New England area. This suggests that the rubies were crystallised during late-stage fractionation of the magmatic melt.





## **INNER-CITY IBIS: THE MECHANISMS WHICH DRIVE THE FORAGING DECISIONS OF AN URBAN EXPLOITER**

**Matthew Chard**

University of Wollongong

Over the last 40 years the population of Australian white ibis, a wetland specialist, has dramatically increased in urban centres. As ibis forage naturally and readily scavenge food, we were interested to assess their behavioural response to rainfall. A 7 year data set was analysed to determine how daily rainfall activity influences the ibis population at Belmore Park in relation to the amount of rain. Further, another study was conducted to identify foraging rates (consumption) of ibis in four urban parks also in relation to rainfall. For all thresholds of rainfall tested, ibis abundance significantly decreased after a rainfall event. Higher rainfall was found to increase this response, with a 46% decline of ibis abundance following rainfall events of >60mm (n = 13). Foraging success suggests that ibis consume food more readily after rainfall events. Our results indicate that rainfall influences the ibis distribution in urban centres either by: decreasing anthropogenic food supplied to the birds, forcing the birds to relocate to forage or; increasing the amount of natural food available elsewhere which ibis identify as being more rewarding or; a combination of the two. We found that increased rainfall intensifies this response. Our results demonstrate the importance of climatic processes on the distribution of urban birds, which was previously overlooked. This study represents the initial framework for future studies investigating ecological responses to climatic processes.



## **TAXONOMY, BARCODING AND PHYLOGENY OF HYDROIDES (SERPULIDAE, ANNELIDA), THE LARGEST GENUS OF NOTORIOUS FOULING AND INVADING CALCAREOUS TUBEWORMS**

**Yanan Sun**

Macquarie University

*Hydroides* Gunnerus, 1768, the largest genus of calcareous tubeworms with 93 nominal species, includes important reef builders, foulers, and biological invaders. Despite their commercial and ecological importance, the taxonomy and phylogeny of *Hydroides* fauna is poorly known. Widely distributed *Hydroides* species could be a species complex with high hidden diversity. In this study, we explore the usage of barcoding with the previously poorly utilised gene COI, investigate the genetic patterns of widespread *Hydroides*, and initiate reference sequences from mitochondrial genome data for barcoding primer design.

*Hydroides dianthus* is one of the widely distributed *Hydroides* species. Unlike the temperature restrictions shown in other species of the genus, *H. dianthus* appears to occur in both temperate and subtropical waters. We sequenced COI from *H. dianthus* specimens collected from eight localities worldwide. Our barcoding data indicates two major clades in *H. dianthus*, both of which could be invasive. Using next-generation sequencing approach, we recovered 39 genes in the mitochondrial genomes of *H. elegans*, and 35 genes in *H. dirampha*, including COI. The gene order does not follow the proposed pattern for Annelida. Phylogenetic analyses of amino acid and nucleotide datasets will be conducted in further studies to infer the evolutionary history of *Hydroides*. Universal barcoding primers for all *Hydroides* species will be designed once more mitochondrial genomes of *Hydroides* become available.



## **DEVELOPMENT OF FORENSICALLY INFORMATIVE DNA MARKERS FOR THE SHORT BEAKED ECHIDNA: THEIR UTILITY AND APPLICATION IN WILDLIFE TRADE**

**Alexandra Summerell**

**University of Technology**

Validation of true genetic pedigree in captive bred animals is only possible through the development of highly variable species-specific DNA markers. The Short Beaked Echidna is significant to the zoo industry as an iconic Australian species of conservation importance. Although captive bred animals are in high demand, some aspects of their care and husbandry are still poorly understood.

According to international data, there is an increasing trend for wild-caught animals to be laundered as 'captive bred' animals. These animals are often offered with paperwork supporting their 'captive bred' pedigree, but the genetic data necessary for Zoo and Aquarium Association industry members to make an informed decision is lacking. Building on precedents in the domestic dog, cat and equine industries, this collaborative project is developing such a program for the Short Beaked Echidna. Drawing upon existing echidna genetic data, we are developing genetic markers that will be optimised to determine relatedness using highly variable and informative SNP (Single Nucleotide Polymorphism) markers. They are being tested on samples taken from echidnas of known pedigree sourced via project collaborators at Perth Zoo, Australia Zoo and Currumbin Wildlife Sanctuary.





## **RAPID DNA IDENTIFICATION OF RHINOCEROS HORN**

**Kyle Ewart**  
University of Sydney

Rhinoceros (rhino) numbers have dwindled over the past century. As a result, three of the five species are considered as critically endangered, one species is vulnerable and one species is near threatened. The main threat to rhinos is the poaching of their horns. Poaching has increased dramatically over the past decade due to the growing demand for horn products in Asia. It is vital to improve rhino forensics and anti-poaching enforcement as part of a multi-faceted approach to control the horn trade. A rapid and robust species identification test utilizing species-specific primers on the cytochrome-b gene was developed. This test minimizes the time and expense of identifying the species of a seized horn or horn derivative. This test was recently implemented in a Vietnamese lab, where many of the seized rhino horns are sent for identification. It is hoped that the increased capacity to identify rhino horn will increase the prosecution rate and hence deter rhino horn trafficking.



# **GENETIC STRUCTURE IN POPULATIONS OF THE MICROGASTROPOD EATONIELLA ATROPORPUREA ALONG SOUTHEASTERN AUSTRALIA AND IMPLICATIONS FOR MARINE BIOREGIONALISATION**

**Rodrigo Roman**

University of Sydney

Microgastropods are a representative component of the biodiversity of the rocky system. They are extremely abundant, are found in several types of habitat, and their patterns of variability reflect those of the whole benthonic assemblage. However, no systematic study has yet examined the connectivity of marine microgastropods in southeastern Australia. This study examined populations of *Eatoniella atroporpurea* from 23 locations dispersed over four Interim Marine and Coastal Regionalisation of Australia (IMCRA) bioregions. Genetic analyses were performed using COI mtDNA sequencing. Multiple phylogenetic analyses revealed a large phylogeographic break for *E. atroporpurea* between the Batemans and Twofold Shelf bioregions, possibly due to cryptic species or historical or oceanographic barriers. Otherwise, bioregional boundaries do not match well with genetic discontinuities. A number of sub-clades were observed along the NSW coastline showing a high patchiness with some degree of spatial overlapping. This suggests that migration between bioregions is not panmictic and that some impediments exist to genetic flow. The fine-scale genetic pattern is consistent with that expected for species with low dispersal capability. The IMCRA model must incorporate the limited gene flow into their reserve planning to optimize conservation of intertidal rocky biodiversity.



## **ATTRACTIVELY ARTIFICIAL: HOW THE BUILT ENVIRONMENT INFLUENCES COMMUNITY COMPOSITION IN COASTAL SYSTEMS**

**Aria Lee**

University of New South Wales

Invasive species can cause serious impacts on the ecology and economy of novel regions. Their successful establishment in new areas has been linked to many factors, one of which is facilitation by anthropogenic structures. These are artificial structures made from materials that do not naturally occur in a locale, either naturally derived or manufactured, and they occur in nearly every environment. Additionally, artificial structures form rigidly geometric shapes with surfaces and orientations that are not found in nature. The way that organisms interact with these new materials and structures can impact on community composition and invader success. We investigated the interactive effects of substrate material and orientation on subtidal sessile community composition by deploying submerged settlement plates attached to backing panels at two marinas in South Australia. Settlement plates were made of turpentine timber, fibre cement or acrylic, as these are common building materials for wharves and pilings. Plates were orientated vertically, horizontally face-down or horizontally face-up. To investigate temporal patterns in settlement and to observe a representative sample of the communities, settlement plates were deployed over 6 months between December 2012 and June 2013. Plate orientation and substrate type caused significant shifts in the colonising community. Early results suggest that the invasive ascidian, *Ciona intestinalis*, recruited more and in higher abundance to horizontal downward facing orientations throughout the duration of the study. This study will inform management strategies for coastal areas at high risk of introduced species, particularly where dense networks of anthropogenic structures exist. Eco-engineering of future construction can also benefit by being informed of building materials that minimise invasive settlement and promote natural communities.



## **‘RED LISTING’ TO HELP SAVE SOUTHEAST ASIA’S AMPHIBIANS**

**Timothy Cutajar**

**Australian Museum Foundation Amphibian Conservation Intern**

Southeast Asian amphibians are facing an extinction crisis, but the global conservation status of amphibians in the region is more than a decade out of date, and most newly described species (~100!) have yet to be assessed. Knowing the global conservation status of a species, which is maintained on the IUCN Red List of Threatened Species (the ‘Red List’), is vital for directing scarce conservation resources to the species that need it the most and can also be used to identify sites for conservation action. My work focuses on updating the global conservation status of mainland Southeast Asian amphibians to ensure that we gain a more accurate picture of the current situation and can develop more informed, and hopefully more successful, conservation actions.





**Presenters at the 2014 AMRI Student Forum (Photo by Stuart Humphries ©Australian Museum)**