

## WHAT'S IN A NAME? *POLYZOSTERIA YINGINA*; THE GOLDEN SUN COCKROACH

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(with one text-figure and three plates)

**Henry, S.C.** 2021 (15:xii): What's in a name? *Polyzosteria yingina*; the Golden Sun Cockroach. *Papers and Proceedings of the Royal Society of Tasmania* 155(2): 135–138. ISSN: 0080-4703. School of Geography, Planning, and Spatial Sciences, University of Tasmania, Private Bag 78, Hobart, Tasmania 7001, Australia. Email: Shasta.Henry@utas.edu.au

The endemic Tasmanian cockroach *Polyzosteria yingina*, was formally described in 2021, 80 years after it was first documented. Evidence from morphology, biogeography and DNA barcodes distinguishes this species from the related mainland Australian taxa it had previously been confused with and united the geographically disparate alpine and coastal populations under a single specific epithet. That specific epithet, *yingina*, was chosen in collaboration with the Tasmanian Aboriginal Centre. This was to acknowledge that, given the species' large size, handsome appearance and overt behaviours, it would once have had Aboriginal names, which now may have been lost due to colonial disruption of language, land and culture.

**Key Words:** *Polyzosteria yingina*, taxonomy, molecular biogeography, *palawa kani*.

### INTRODUCTION

Taxonomic descriptions, like many other finely honed scientific tools, can be sterile and charmless. By necessity or convention, they remove the many human details of choosing a name for a species, summarising the weighty decision as several sentences under 'Etymology', relegated to the very end of a description. This is in stark contrast to our sense of importance and appreciation for the meaning of names. That we have spent 200 years, laboriously naming only one tenth of the global biodiversity without resorting to randomly generated numbers is a testament to our attachment to names. Language and its meaning are potent.

Many species' scientific names serve as a monument to a scientist's legacy, such as the many species named in honour of Charles Darwin. Of the Northern Australian Darwin Toadfish, originally named *Tetrodon darwini*, Castelnau wrote 'Dedicated to the greatest naturalist of the age' (Castelnau 1873, p. 95). A cryptic Tasmanian *Oenochroma* moth which went unnoticed as a separate species until 2009 was given the specific epithet of *barcodificata* to acknowledge the technological advancement which made its detection possible (Hausmann *et al.* 2009). A tiny Western American moth species *Neopalpa donaldtrumpi* Nazari (2017) was named to leverage its quiff of blonde scales (akin to the hairdo of the infamous 45th President of the United States) into international notoriety. While this example may lack the honorific of those attributed to Darwin, Nazari's intention of garnering attention for biodiversity protection acknowledges the power of a 'name'.

In 2021, two years of research work closed a chapter in Tasmanian taxonomy which had previously been open for 80 years though possibly more than 10 000 years. This was the publication of a scientific species name for the endemic Tasmanian cockroach commonly known as the Golden Sun Cockroach, now formally as *Polyzosteria*

*yingina* Henry. It is a very large insect for Tasmania and especially eye-catching with the colour and finish of hammered bronze (pl. 1). The species is active during the day, basking on the sand dunes of the east coast or feeding on alpine heath flowers around the Central Plateau lakes (Richards & Spencer 2019).

### THE 80-YEAR STORY

It is unusual for such a conspicuous species to remain unnamed for so long (Gaston 1991), yet *P. yingina* appears to have actively evaded it. The oldest known specimen in collections was lodged at the Tasmanian Museum and Art Gallery (TMAG) in 1941. The entire genus was 'thoroughly' reviewed Australia-wide in 1965 by Josephine Mackerras who even described one putative new species based on a single



PLATE 1 – One of the public photographs of *P. yingina* published in Henry *et al.* (2021). A male specimen observed while the photographer was fishing at Christys Creek, Central Plateau, Tasmania, 41°52'16.09"S; 146°26'13.56"E; 1169 m asl; 24 Feb. 2011. Body length: 26–30 mm. Photo: Daniel Hackett

specimen. Therefore, it is assumed Mackerras was unaware of the Tasmanian specimen, to have not treated it the same way. The discovery of a male specimen in 1972 led to the species being mis-ascribed as *P. oculata* Tepper (core range is Kangaroo Island, SA) based solely on the examination of external features (Green 1973). As was later learned, the male genital assemblages of *P. oculata* and *P. yingina* are discernibly different, even when only consulting the illustrations of Mackerras (1965). Tasmanian researchers had studied the species' natural history in detail (Richards & Spencer 2019), even sending several specimens away for DNA barcoding in 2012 (Spencer & Richards 2012), which still produced no name. In 2019 the Australian Faunal Directory (<https://biodiversity.org.au/afd/home>) still listed *P. oculata* as the species occurring in Tasmania and due to online photograph and natural history databases, new misidentifications were disseminating. The Encyclopedia of Life (EOL) and thereby the Atlas of Living Australia, labelled specimens photographed in Tasmania as *P. viridissima* Shelford (core range within Kosciuszko National Park, Vic.) based on the clearly speculative identification of the photographer contributing to the EOL Flicker Group (<https://eol.org/media/6790840>).

These online photographs became a key aspect of this species' eventual identity. Like many other *Polyzosteria* cockroaches in Australia (Rentz 2014), *P. yingina* is not only a large, diurnal, strikingly coloured and active species but in Tasmania is locally abundant in low contiguous scrub in parts of the Central Highlands (Spencer & Richards 2012, Fearn & Maynard pers. comm.), as well as hundreds of kilometres away on Tasmania's eastern beaches. As such, many people are familiar with the species; so much so, the catalogue of specimen records was increased by 30% through the contribution of photographs from repositories such as Facebook, Instagram and Flickr (Henry *et al.* 2021). Fishers who frequent the Central Highlands refer to cockroach bait (Rist 2009) for 'roach-fishing' and have a fly-tie based on this species (Hackett pers. comm.). Fishers' regular sightings of the cockroaches floating in tarns and lakes also contributed to the 'rafting downstream from the Central Highlands to the coast' hypothesis which attempts

to explain how Tasmania has two distant populations which are nevertheless genetically indistinct (Henry *et al.* 2021, although see Richards & Spencer (2019) for further conundrums). *Polyzosteria* cockroaches are so bold as to stand their ground when alarmed, exposing their brightly coloured terminalia and spraying a noxious smelling liquid if threatened (Mackerras 1965, Rentz 2014, Richards & Spencer 2019). One specimen label in the Queen Victoria Museum and Art Gallery (QVMAG) collection recounts how the cockroach was collected from a home in Scamander after 'nearly blinding a dog pursuing it' (pl. 2).

## THE 10 000-YEAR STORY

*Polyzosteria* cockroaches are apterous, meaning wingless. As they cannot fly and are most abundant and speciose on mainland Australia, it is assumed they have been isolated in Tasmania for at least 10 000 years when the ending ice age flooded the Bassian Plain creating Bass Strait. During this long period of isolation, the Tasmanian species evolved a unique set of physical features and hence unique genetic barcode enabling it to be more easily distinguish from related species (Henry *et al.* 2021, pl. 3), yet ironically, we know the least about this longest period of its history. As indigenous names often convey knowledge about form, use, distribution and ecology (Gillman & Wright 2020), if Tasmanian Aboriginal languages had been better preserved, we might know more about this species than we do today, not least its traditional name/s. Over thousands of years of cohabitation, such an obvious species would certainly have attracted the attention of Aboriginal people in the same way that it is known to local communities now. Therefore, in 2019 choosing a specific epithet for this cockroach was deferred to the Tasmanian Aboriginal Council *palawa kani* Language Program.

This is not the first time that Tasmanian Aboriginal words have fulfilled the taxonomic tradition of type locations being used as specific epithets ('tarkinensis' Shear & Mesibov 1995, 'kunanya' Byrne & Wei 2012) nor the first time they have been used expressly for the inclusion of Aboriginal language. Taxonomist L.E. Couchman has left a significant legacy of intentionally ascribing Tasmanian insect species Aboriginal names (Couchman 1953, 1965). The use of 'truganini' for naming species (e.g., Monrós 1958, Slater & Sweet 1970, Moore 1981, Key 1991, Shear & Mesibov 1995, Mesibov 2003, Schmidt & New 2008) may appear unambiguously honorific. However the previously noted brevity of naming rationale mean that Monros' reason for naming Tasmanian species *Microdonacia truganina* (from his home in Germany, 1958), is not included in the manuscript, and Slater & Sweet's (1970, p. 292) etymological statement "We take pleasure in naming this species (*Tasmanicola truganinae*) after the last Tasmanian Aborigine to survive" is made less clear by its historical context; the paper was published in apartheid era South Africa. Schmidt and New show how simple clarity can be, of *Ptycta pallawahensis* the authors wrote "In reference to pallawah, an indigenous term of self-reference, and the former name of the type locality prior to it being named

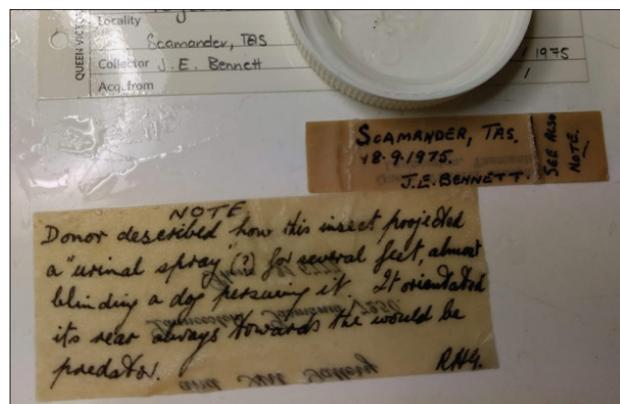


PLATE 2 – This handwritten account accompanying the *P. yingina* specimen QVM:2015:12:1499 from Scamander is one of few records of the Tasmanian species actively spraying in defence as other *Polyzosteria* are known to do.

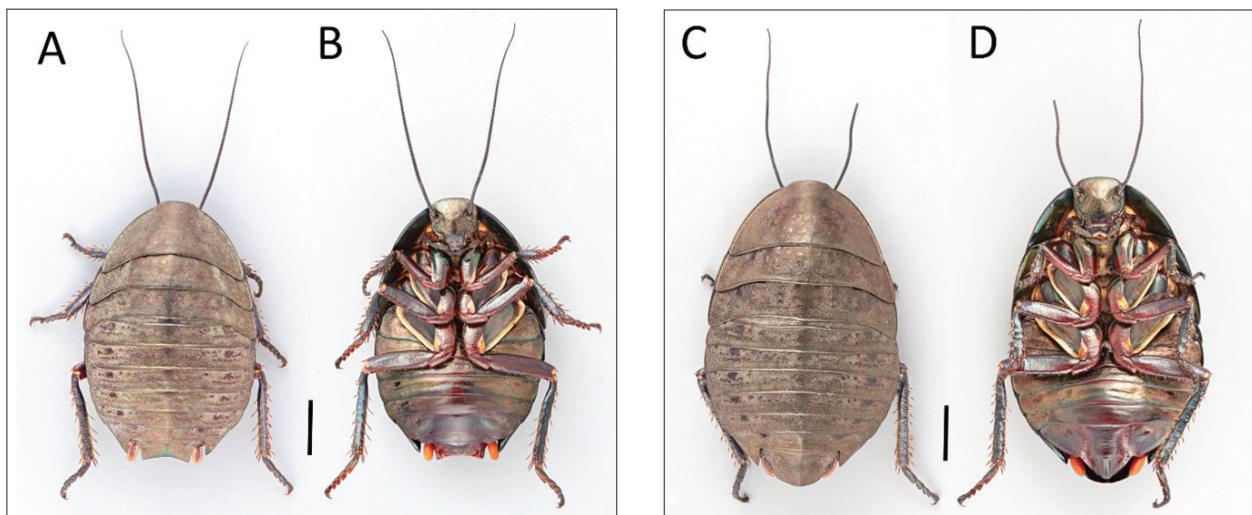


PLATE 3 – *Polyzosteria yingina* photo paratypes from Henry *et al.* (2021). **A, B** Male TMAG: F13361. **C, D** Female TMAG: F13354. **A, C** dorsal view. **B, D** ventral view. Scale bars 5 mm.

Daisy Dell" (Schmidt & New 2008, p. 141). While the motivation for ascribing Aboriginal names are the authors own, the question arises as to whether the Indigenous community is ever consulted, or even alerted to their existence? The policy preamble for the Aboriginal Dual Naming of Tasmanian geographic places states that while some contemporary Tasmanian place names are based on the names used by Tasmanian Aboriginal people, they are often based on European interpretation and were co-opted without consent (ADNP 2019).

There is a discord in the distribution of global biodiversity and taxonomy. Most new species described are from the global south in publications from the global north (DuBay *et al.* 2020, Giangrande 2003). Therefore, thousands of equatorial species have been ascribed their scientific name in a language foreign to the country of origin. The type-specimen of the Australian Botany Bay Weevil (*Chrysolopus spectabilis*) for example was collected in 1770 by Sir Joseph Banks, described in Latin and stored along with other Australian and New Zealand (Aotearoa) type-specimens in the London Natural History Museum (Radford 1981). Following this scientific protocol, many natural history specimens have become alienated from the communities who live with the organisms themselves which is now considered an environmental injustice (Ritvo, 1990).

palawa kani means 'Tasmanian Aborigines speak'; it is the only Aboriginal language in lutruwita (Tasmania) today. Between 8 and 16 separate languages could have been spoken here originally; we will never really know. Some tribes had been wiped out by contact sicknesses even before full scale invasion and the languages continued to die away with the people. Fortunately, remnants of many of those original languages were written down in wordlists by more than twenty different European recorders and some phrases, sentences and songs remembered by Aboriginal people. Tragically, there aren't enough words or information recorded of any of the original languages to rebuild any one of them exactly as it was. As a result, palawa kani combines words retrieved from as many of the original languages as possible. After two decades, Aboriginal people of all ages can now

speak palawa kani, the language of Tasmanian Aborigines, and children learn it from an early age. (TAC 2021)

In the absence of a recorded Aboriginal name matching this species' description – although there no doubt would have been one (Annie Reynolds, Co-Ordinator *palawa kani* Language Program 2019, pers. comm.) *Polyzosteria yingina* shares the *palawa kani* name of the Great Lake 'yingina' which is the eastern boundary of this species' alpine distribution (fig. 1). 'This specific name was chosen in collaboration with the Tasmanian Aboriginal Centre; acknowledging that given the species' size and diurnal habits, it would once have had an Aboriginal name, one which has been lost due to colonial disruption of Aboriginal land, culture and language' (from *P. yingina* 'Etymology' in Henry *et al.* 2021, p. 395).

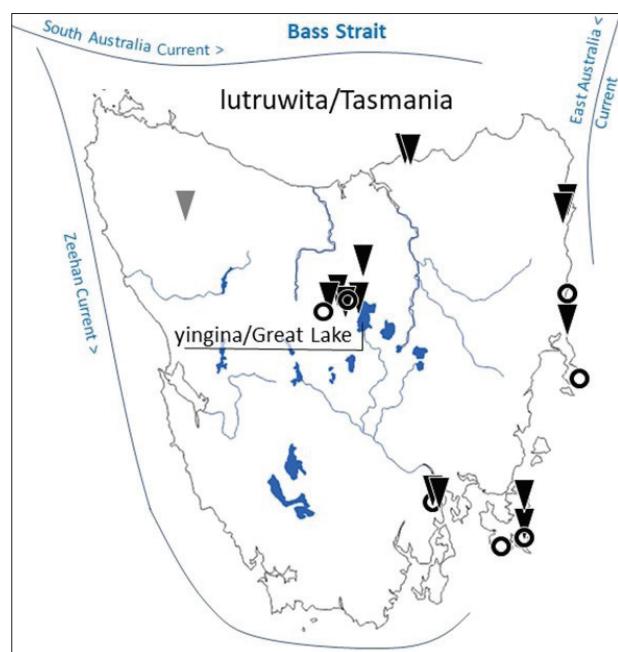


FIGURE 1 – Distribution map of *Polyzosteria yingina* in Tasmania, Australia; *palawa kani* dual place names are used. Triangles indicate physical specimen locations; circles indicate verifiable photographs (all location data in Henry *et al.* 2021).

A specific epithet can act as an honorific due to our sense of the importance of names. However due to demographic imbalance the way taxonomists have traditionally chosen to honour people reflects this inherent bias (Pillon 2021). By sharing the responsibility of naming species, taxonomists may better share the associated sense of ownership with traditional owners (Hágsater & Wrazidlo, 2020). Just as Tasmania recently established a framework to restore Aboriginal place names (ADNP 2019), more taxonomists are advocating for the de-colonisation of science nomenclature in favour of more representation of Indigenous languages (Gillman & Wright 2020). The revival of Tasmanian Aboriginal language is creating the dual resources of more written words for inclusion in the scientific literature and a groundswell of speakers and scholars who can be consulted about the use of their language.

## ACKNOWLEDGEMENTS

I thank my reviewer for helpful and accurate feedback on the initial submission of this manuscript. The original research was completed thanks to the collaboration of Stephen Cameron and Adam Smolenski; Karen Richards and Chris Spencer; the Tasmanian and Queen Victoria museum and art galleries; and The Tasmanian Aboriginal Centre's *palawa kani* Language Program.

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