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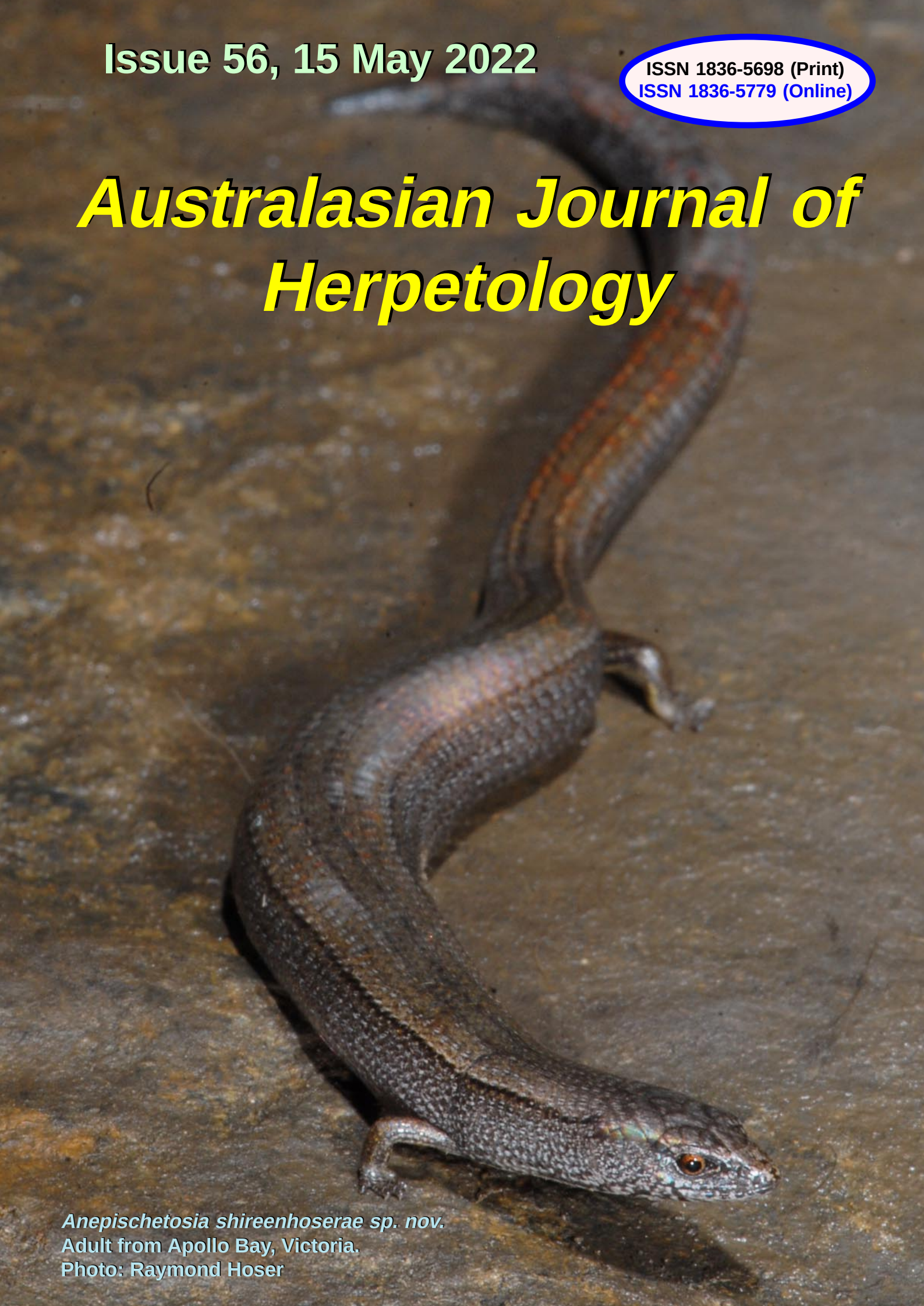

Anepischetosia shireenhoserae sp. nov.
Adult from Apollo Bay, Victoria.
Photo: Raymond Hoser

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Hiding in plain sight. A previously unrecognized biogeographical barrier in Australia formed by an event of biblical proportions. Five new species of skink lizard from south-west Victoria, three more closely related species from New South Wales and another from South Australia.

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ABSTRACT

Formed by Volcanic eruptions on a Biblical scale, some 3 to 5 MYA, the creation of most of the basalt plains in central and western Victoria created an impenetrable biogeographical barrier to the movement of some previously wide-ranging species of frog and lizard.

Species found across southern Victoria were split into refugia west of where Melbourne, the State capital now stands. The relevant taxa in turn evolved into distinctive new species over the following 3-5 MYA.

The principal refugia are the Otway Ranges, hilly country west of Warrnambool and the Grampians, causing at least 2 populations of two species of frogs and 4 lizard populations to split off from the two main populations in hilly regions east of Melbourne.

The relevant frogs were formally named by Hoser in 2020 and the four skink lizard species are formally named in this paper.

Another previously wide ranging taxon was split two ways at the species level by the same geological events and the western population is formally named for the first time.

Three distinctive and divergent species in New South Wales, closely related to these skink taxa are also named for the first time as is another unnamed species in South Australia.

A new genus is erected for five very divergent species for which current and changing generic assignments, each genus including other type species, has not been appropriate.

Keywords: Biogeography; taxonomy; nomenclature; Victoria; Australia; New South Wales; South Australia; ACT; skink; lizard; frog; Otway; Otways; Guyra, Eyre Peninsula; basalt; basalt plains; sedimentary rocks; *Anepischetosia*; *maccoyi*; *brindabellaensis*; *sharmani*; *Pseudemoia*; *spenceri*; *weekesae*; *Claireascincus*; *rawlinsoni*; *baudini*; *pagenstecheri*; *entrecasteauxii*; new genus; *Mcphieus*; new species; *shireenhoserae*; *simonkortlangi*; *danielmannixi*; *mcnamarai*; *davidkerryi*; *hadynmcphiei*; *michaelmatheri*; *scottgranti*; *jackyhoserae*.

INTRODUCTION

In late 2019, while teaching dogs Snake Avoidance ® training at an address at the township of Apollo Bay, western Victoria, (Australia) Latitude 38.7552° S., Longitude 143.6676° E., I took time out to start searching for specimens of the frog species *Limnodynastes cameronganti* Hoser, 2020 (Hoser, 2020b) and *Geocrinia otwaysensis* Hoser, 2020 (Hoser 2020e), the latter taxon originally described as a subspecies of *Geocrinia victoriana* (Boulenger, 1888) (see below).

At the same time, I also found numerous specimens of putative *Anepischetosia maccoyi* (Lucas and Frost, 1894). Having photographed and inspected numerous specimens of this taxon from immediately adjacent to the type locality (my most recently inspected specimens being from about 30 km straight line east of Ringwood, Victoria, being viewed and photographed just seven days prior), and being very familiar with this taxon throughout eastern Victoria, I immediately noticed what I thought were stark species-level differences between the Apollo Bay animals (more than 100 km south-west of Melbourne) and those of the nominate form (east of Melbourne).

Most striking was the obvious yellow venter, which strongly contrasts with the obviously orange venter in the type form, as well as the red stripes running longitudinally down the (original)

tail, not seen in the nominate type form.
With more than 20 specimens of each inspected just a week apart, I knew that the differences were consistent.

Inspection of photos of both, enlarged on a computer screen, yielded many other consistent differences between the forms which led me to believe that I had a new species.

MATERIALS, METHODS AND RESULTS

In order to satisfy myself that I had a new species within the genus *Anepischetosia* Wells and Wellington, 1985 and in the absence of DNA comparisons of the two forms, I sought alternative means to verify, what appeared to be obvious.

An audit of museum holdings in Australia for putative *Anepischetosia maccoyi* confirmed that the Otways population (of which Apollo Bay is a part) was isolated. In turn another population further west of the Otways population, being generally west and north of Warrnambool was also isolated from the main population. The main population occurs in a broad region commencing east of Melbourne, through the Great Dividing Range almost as far north as Sydney.

Type *Anepischetosia maccoyi* with a type locality of Ringwood, east of Melbourne, is of the main population, and I note that Wells and Wellington (1984) and Wells and Wellington (1985) had already identified and named two isolated populations in the northern part of the NSW range as separate species.

These were *A. sharmani* (Wells and Wellington, 1984) from the Illawarra Escarpment and *A. brindabellaensis* Wells and Wellington, 1985 from the Brindabella Ranges, west of Canberra on the border of the ACT and NSW.

While gaps in distribution could be attributed to non-collection of relevant localities, this possibility was dismissed on the basis that putative *Anepischetosia maccoyi* are known to be absent from intervening localities on the basis of habitat, which often, but not exclusively included basalt plains.

Excluding the basalt plains, other areas separating populations of putative *A. maccoyi* were consistent in having one or more of the following exclusionary characteristics, these being dryness, flatness without rocks, sand dunes or similar, or a combination of one or more of these.

In the case of the Otway Ranges population of putative *A. maccoyi*, the modern day barriers stopping mixing of this population with those further east are obvious.

East of the Otways the terrain is flat and either sandy, or clay.

Rainfall, is affected by the Otways creating a rain shadow and is therefore low, again exclusionary for this taxon. Similar is west of the Otways, while north of the ranges are the volcanic plains, which again carry a suite of fauna typical of dry granite areas of the rain shadows of the western slopes of the Great Dividing Range, which is again exclusionary for the putative species, unless immediately proximal to prime habitat.

To the south of the Otway Ranges is Bass strait, which is an area again of flat relief and even in times of glacial minima (being dry land), was both sandy and flat, both of which are exclusionary for the taxon and gives a good reason why it has never been found in Tasmania.

So while I was satisfied that the Otways population was isolated at the present time, I needed to establish a timeline that was archaic enough to A/ Have cut off the populations long enough to have diverged to be separate species and B/ Establish a point in time prior, when at least one habitat corridor existed to allow the populations to establish in both places and be in contact.

This calibration was done two ways.

Joyce (2003) established that the basalt plains north of the Otways, including those to the west of Melbourne, substantively formed 3-5 MYA, effectively cutting off the Otways population of putative *A. maccoyi* from those to the north-east.

However I also searched for evidence from other vertebrates potentially described as endemic to the Otways, and known to have been isolated from other similar species to the north and east of Melbourne.

Initially I found none, but then revisited the frog formally described as *Limnodynastes cameronganti* Hoser, 2020 (Hoser, 2020b), which also happens to be an Otway ranges endemic.

When that taxon was named, the fact that sealed the conclusion it was a separate species from its nearest relative to the east, was the molecular evidence of Schäuble *et al.* (2000) clearly separating it from putative *Limnodynastes peronii* (Duméril and Bibron, 1841).

Morphological divergence on its own was not enough for me to conclude that frog was a different species.

The paper by Schäuble *et al.* (2000) confirmed that *Limnodynastes peronii* (Duméril and Bibron, 1841) *sensu stricto* was more divergent from the Otways species *Limnodynastes cameronganti* Hoser, 2020 than were the putative species and subspecies of *Platyplectron dumerilii* Peters, 1863 from one another and so on that basis there was no need to establish either an exact date calibration for when *Limnodynastes peronii* (Duméril and Bibron, 1841) *sensu stricto* diverged from *Limnodynastes cameronganti* Hoser, 2020 and/or the related *L. alexantenori* Hoser, 2020 (found generally in Melbourne's east and further east in Victoria), or what exactly was the biogeographical features or event/s that caused the populations to split.

Noting that disjunct populations can expand to cover previously uninhabited areas, the need to spend time establishing the barrier or events that caused *Limnodynastes peronii* (Duméril and Bibron, 1841) *sensu stricto* to diverge from *Limnodynastes cameronganti* Hoser, 2020 and the related *L. alexantenori* Hoser, 2020 was not needed at the time for me to be able to assert the latter two species were valid and unnamed taxa.

This was the case at the time the paper was being prepared and written and as a frog paper only, the need to establish facts potentially relevant to the identification of potential new skink species was simply not there.

However in the context of the apparently new taxon associated with *A. maccoyi* from the Otway Ranges, the apparently parallel divergence of *L. cameronganti* from *L. alexantenori* and *L. peronii* also became relevant.

On the basalt plains, generally west of Melbourne, these species are largely replaced with the ubiquitous *Limnodynastes tasmaniensis* Günther,1858.

In terms of the putative taxon, *A. maccoyi* from the Otway Ranges and ranges east and west of there, it is replaced on basalt plains by the morphologically similar lizards in the ubiquitous *Nodorha bougainvillii* (Gray, 1839) species group. *Nodorha bougainvillii* is better known as *Lerista bougainvillii*, but the generic assignment of Mittleman, 1952, adopted by Wells and Wellington (1984, 1985) and Wells (2002) is corroborated by molecular studies since (e.g. Pyron *et al.* 2013) (see their phylogeny) and so is adopted as the correct genus name for these lizards here.

With effectively parallel DNA evidence available for the divergence of *L. cameronganti* from *L. alexantenori* and *L. peronii* which could reasonably be expected to yield a similar result for the putative *A. maccoyi* populations and a calibration of known dates of formation of the basalt plain barrier to movement between the populations, this being the only newly created biogeographical feature in the region (ignoring the climatic and sea level changes and oscillations over the past 5 MYA), I had no hesitation in concluding that the Otway Ranges population of putative *A. maccoyi* was a separate and hitherto unnamed species.

It is therefore formally named according to the rules of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999) as amended as a new species.

The same geological events that split the Otway Ranges population of putative *A. maccoyi* also split populations further west, being those west and north of Warrnambool in western Victoria. They too were morphologically distinct and with the

antiquity of the separation being dated at 3-5 MYA as per Joyce (2003), I had no hesitation in concluding that this population was also a hitherto unnamed species and so it too is formally named in this paper.

Noting that the volcanic eruptions that created the basalt plains in Victoria had now been shown to have created at least 3 species, being the two skinks and the frog species already identified above, I then turned my attention to other putative species that may in fact be complexes of species across the same relatively recently formed biogeographical barrier.

While DNA evidence is not yet available, based on the preceding it appears that the morphologically divergent frog formally described as *Geocrinia victoriana otwaysensis* Hoser, 2020, (Hoser 2020e) separated from nominate *Geocrinia victoriana* (Boulenger, 1888) by the same basalt plains, is almost certainly a full species that diverged from the nominate form 3-5 MYA.

As a result of this conclusion, I herein formally elevate *Geocrinia victoriana otwaysensis* Hoser, 2020 to the full species of *Geocrinia otwaysensis.*

There are no snakes, turtles, crocodiles, dragon lizards, legless lizards, geckos or monitors that are either found in the Otway Ranges, or with populations isolated there.

Other than the two frog species referred to already, there appear to be no others with Otway Ranges isolated populations.

So in terms of all these groups, it is safe to say that there are no Otways endemics that have been overlooked.

However with the skinks, a very different picture did emerge.

The putative species *Pseudemoia spenceri* (Lucas and Frost, 1894), with a type locality of Dandenong Ranges and south-east of Melbourne, Victoria (Coventry 1970, Rawlinson 1974), has a range encompassing cooler parts of south-east Australia. This range commences in the high altitude area west of Sydney, through most of Victoria to include both the Otway Ranges and the Grampians in Western Victoria.

Kinghorn (1929) named the Mount Kosciusko (NSW) form as *P. weeksae* (Kinghorn, 1929).

See Cogger *et al.* (1983) for the taxonomic history of both names.

The latter species has since been treated by all authors as a synonym of the former in all publications since (e.g. Hutchinson *et al.* 1990, Hutchinson and Donnellan 1992 and even Haines *et al.* 2014).

Exceptional to this was Wells and Wellington (1985) who did, without giving any reason, resurrect *P. weeksae* from synonymy. They wrote:

"Pseudemoia weeksae *(Kinghorn, 1929). Herein resurrected from the synonymy of* Pseudemoia spenceri*;* P. weeksae *is believed confined to southern N. S. W.*"

Significantly and after inspecting specimens from across the range for the putative species *P. spenceri* I agree that Wells and Wellington in their statement, were wholly correct, even if they did not present any evidence in support of it at the time.

In any event, the molecular evidence of Haines *et al.* (2014) confirmed that not only are the two forms different species based in molecular divergence, but that a third form from New South Wales with a population centre being the western edge of the Blue Mountains is an unnamed species.

Seven years have passed and no one has shown any interest in naming the relevant species and so, this also came under my scrutiny in terms of assessing the Otways population of putative *P. spenceri*, currently the only recognized mainland Australian taxon in this genus, based on the generic assignments in this paper.

The one other species in the genus is the Pedra Branca Skink, *P. palfreymani* Rawlinson, 1974, occurring on the wind-swept islet south of Tasmania (Hoser 1991).

For the record (from Genbank at https://www.ncbi.nlm.nih.gov/genbank/), the sampled specimens shown by Haines *et al.* (2014), which on the basis of divergence are clearly of three species, are as follows:

1/ NMVZ19287, collected from Mount Baw Baw, Victoria and representative of the type form of *P. spenceri* (Lucas and Frost, 1894);

2/ ABTC11323, collected from Nimmitabel, NSW (near Cooma), being representative of the type form of *P. weekesae* (Kinghorn, 1929);

3/ ABTC11329 collected from Hampton, NSW, near Jenolan Caves on the western edge of the Blue Mountains, until now unnamed and herein formally described as the new species *P. davidkerryi sp. nov..*

In terms of populations from the Otway Ranges and the Grampians, each are separated from each other and all other putative *P. spenceri* by distribution, created by a barrier of known antiquity.

Based on obvious morphological divergence of each population, I again have no hesitation in naming each of these as new species.

Furthermore, I again note that those specimens from the Upper Blue Mountains and the Oberon area, west of there in the New South Wales central highlands are also divergent in both distribution and morphology, also in association with a biogeographical break of known antiquity and therefore it is also formally named for the first time as a new species as indicated already.

The genus *Pseudemoia* Fuhn, 1967 has been variously defined, ranging from a broad assemblage of species (*sensu* Haines *et al.* 2014), split several ways, *sensu* Wells and Wellington (1985), with the molecular evidence of Haines *et al.* (2014) largely supporting the conclusions of Wells and Wellington (1985), which in turn followed the genus level taxonomy of Rawlinson (1974).

Rawlinson (1974) speculated on past distribution of the genus *Pseudemoia* as defined by him, with reference to biogeographical events.

Clearly based on distribution, ranges of taxa have contracted. However this may not have been the case in the recent past, especially in the period following human habitation in Australia.

Rawlinson (1974) wrote under "Habitat" the following,

"*Found only in regions of high rainfall (more than 75 cm per year). Populations within these regions are restricted to dead trees or rocky outcrops in montane wet sclerophyll forests and rocky outcrops in subalpine woodlands.*

The exposed surfaces of the trees or rocks are used for basking and foraging sites during activity, while crevices are used for shelters when inactive."

Rawlinson (1974) also wrote:

"*The densest populations are found on large fire killed or fire damaged trees in burnt regenerating montane forests.*"

Greer (1982) confirmed these findings explicitly.

This has also been my experience with respect of lizards of the putative taxon, *P. spenceri*, noting a strong increase in numbers in areas affected by the Black Saturday Bushfires in Feb 2009 (as detailed by Hoser 2010).

Noting that during recent ice-age maxima, rainfalls in south-east Australia were significantly lower than at present, spread of extant populations would have been prevented across regions currently devoid of these lizards, confirming the contention that currently separated populations have been this way for some time.

It should also be noted that the fire-stick economy of tribal Aboriginals in south-east Australia pre-dating the European invasion of Australia in the 1700's would have also assisted putative *P. spenceri* and assisted both increases in numbers and dispersal in the most recent prehistorical past, that being defined as in the 40K years predating the British dominated European invasion of Australia, combined with the genocide and near

extermination of the original Aboriginal inhabitants.

Two putative species, originally described as *Leiolopisma rawlinsoni* Hutchinson and Donnellan, 1988 and *Leiolopisma baudini* Greer, 1982 are divergent from the rest and have been placed in various genera, including *Pseudemoia* (type species: *Lygosoma* (*Emoia*) *spenceri* Lucas and Frost, 1894) by most publishing authors since, or *Claireascincus* Wells and Wellington, 1985 type species, *Lygosoma entrecasteauxii* Duméril and Bibron, 1839.

While it is evident on the phylogeny of Haines *et al.* (2014) that *Claireascincus* Wells and Wellington, 1985 is a valid and separate genus-level grouping distinct from type *Pseudemoia*, Haines *et al.* (2014) also clearly show that *Leiolopisma rawlinsoni* Hutchinson and Donnellan, 1988 and *Leiolopisma baudini* Greer, 1982 should also be placed in a genus of their own. The genus *Mcphieus gen. nov.* is erected to accommodate those species.

Haines *et al.* (2014) also show that putative "*Leiolopisma rawlinsoni* Hutchinson and Donnellan, 1988" consists of two species and further inspection of live specimens by myself from across the known range of the species shows clear morphological divergence between them.

The western Victorian population, herein formally named as *Mcphieus hadynmcphiei* is also the type species for the new genus.

The same biogeographical event, of biblical proportions, being the volcanic eruptions in western Victoria is the event (or sequence of events) that appears to have split the population of the putative "*Leiolopisma rawlinsoni* Hutchinson and Donnellan, 1988" some 3-5 MYA.

That putative taxon is not found in the Otways proper, but instead is an inhabitant of usually flatter and swampy areas, sand dunes or clay type of soils. They do not however inhabit basalt plains, except when immediately adjacent to other areas they are found.

A divergent population of putative "*Leiolopisma rawlinsoni* Hutchinson and Donnellan, 1988" from the Brindabella Ranges in Southern New South Wales, not sampled by Haines *et al.* (2014) is also formally named as a new species.

There is no molecular evidence available relevant to the status of populations of "*Leiolopisma baudini* Greer, 1982" and whether all lizards presently referred to this species by herpetologists in Australia are conspecific.

However Greer (1982) makes it clear that the specimens until then referred to as "*Lygosoma entrecasteauxii* Duméril and Bibron, 1839" from the Eyre Peninsula Region of South Australia are not of the same species.

In spite of this, and noting the morphological similarity of these lizards to Greer's species, "*Leiolopisma baudini* Greer, 1982", those specimens of "*Lygosoma entrecasteauxii* Duméril and Bibron, 1839", have since been transferred to Greer's "*Leiolopisma baudini* Greer, 1982" most recently by other herpetologists, this also being reflected in the distribution map of Cogger (2014) and in the various museum specimen databases. Cogger (2014) also claims "*Pseudemoia entrecasteauxii*" occurs on the Eyre Peninsula, but this error is probably an editorial oversight, as Haines *et al.* (2014) published at the same time and based on similar information, make it clear that this is not the case. Relevant specimens from this region (Eyre Peninsula) are categorised as "*P. baudini*" and are conspecific with one another (based on two separated Eyre Peninsula samples), but are not tested against a sample from the very disjunct Western Australian population of "*P. baudini*", that being Greer's type form.

These two populations are (based on museum samples in Australia) separated from one another by at least 400 km straight line measurement and as demonstrated by Greer, morphologically distinct from one another (at consistent species level divergence) and in turn from all other species within *Pseudemoia sensu lato*.

On that basis I have no hesitation in formally naming putative Eyre Peninsula "*P. baudini*" as a new species, in this case being formally named *Mcphieus scottgranti sp. nov.*.

Inspection of putative *Lygosoma entrecasteauxii* Duméril and Bibron, 1839 from the Otway Ranges did not yield any obvious differences between these lizards and those from eastern Victoria, also inspected at the same time, side by side. Significantly, this species also makes intrusions into the basalt plains, implying that the barrier created by the volcanic eruptions 3-5 MYA is not as rigid for this taxon.

Of note is that Wells and Wellington (1985) did formally name several forms in the "*Lygosoma entrecasteauxii* Duméril and Bibron, 1839" complex, some or all of which were confirmed as valid taxa by Haines *et al.* (2014).

My own inspection of specimens also shows that there are strong regional differences worthy of species-level recognition, which in some cases has already occurred.

However one very divergent form that was not named previously is that from around Guyra in northern New South Wales.

This part of the New England region has a number of vertebrate species separated by a well defined break from similar species further south as explained by Haines *et al.* (2014) at page 93.

The Gurya species is formally named in this paper for the first time as *Claireascincus jackyhoserae sp. nov.*.

In terms of all the formal descriptions, and preceding them, I managed to inspect live and dead specimens of all putative species in the genus *Anepischetosia* Wells and Wellington, 1985 as well as all three genera within *Pseudemoia sensu lato* as adopted herein, namely *Pseudemoia* Fuhn, 1967, *Claireascincus* Wells and Wellington, 1985 and *Mcphieus gen. nov.* enabling the newly named species to be separated on the basis of consistent differences in morphology.

These differences alone made the relevant populations worthy of taxonomic recognition.

In terms of level of division, be it species or subspecies, the decision to recognize each newly named form herein was based primarily on the dating of divergence times, based on the relevant geological events.

The volcanic eruptions that changed habitats in a band north of the Otway Ranges to an average width of about 100 km (straight line) have been dated at about 3-5 MYA and ice-age temperature and rainfall fluctuations, along with variations in sea-level covering and uncovering land bridges merely served to maintain other pre-existing barriers to the dispersal of the species.

The same applies to the Grampians species, including specimens found in regions to the south.

In terms of the two NSW forms formally named herein, both are also morphologically distinct and found across biogeographical barriers of known antiquity and that separate previously described similarly affected sibling species, including for example in the skink genus *Eulamprus* Fitzinger, 1843 or the putative species *Burramys parvus* Broom, 1896, divided into regional taxonomic entities by Hoser (2020a).

East-west divisions of species across the Great Australian Bight are not unheard of with reptiles, including for example, what was until recently the single species *Nephrurus stellatus* Storr, 1968.

That species was split two ways by Hoser (2016a) on the basis of both morphological and molecular divergence.

While consulting current literature in the form of Cogger (2014) to ascertain currently recognized species within *Anepischetosia* Wells and Wellington, 1985 as well as all three genera within *Pseudemoia sensu lato* as adopted herein, namely *Pseudemoia* Fuhn, 1967, *Claireascincus* Wells and Wellington, 1985 and *Mcphieus gen. nov.* all the scientific literature was consulted to identify potential synonyms and those synonyms that could be referred to valid taxonomic entities.

Where applicable, those species are recognized as valid as outlined in the relevant descriptions of new species.

INFORMATION RELEVANT TO THE FORMAL DESCRIPTIONS THAT FOLLOW

There is no conflict of interest in terms of this paper or the conclusions arrived at herein.

Several people including anonymous peer reviewers who revised the manuscript prior to publication are also thanked as are relevant staff at museums who made specimens and records available in line with international obligations.

In terms of the following formal descriptions, spellings should not be altered in any way for any purpose unless expressly and exclusively called for by the rules governing Zoological Nomenclature as administered by the International Commission of Zoological Nomenclature (ICZN).

This includes if gender assignment of suffixes seems incorrect, Latinisation is wrong, apparent spelling mistakes and so on.

In the unlikely event two or more newly named taxa are deemed to be the same by a first reviser, then the name to be used and retained is that which first appears in this paper by way of page priority and as listed in the abstract keywords.

Some material in descriptions for taxa may be repeated for other taxa in this paper and this is necessary to ensure each fully complies with the provisions of the *International Code of Zoological Nomenclature* (fourth edition) (Ride *et al.* 1999) as amended online since.

Material downloaded from the internet and cited anywhere in this paper was downloaded and checked most recently as of 19 December 2021 (including if also viewed prior), unless otherwise stated and was accurate in terms of the content cited herein as of that date.

Any online citations within this paper, including copied emails and the like, are not as a rule cited in the references part of this paper.

Unless otherwise stated explicitly, colour and other descriptions apply to living adult specimens of generally good health, as seen by day, and not under any form of stress by means such as excessive cool, heat, dehydration, excessive ageing, abnormal skin or reaction to chemical or other input.

SVL or SV means snout-vent length, TL means tail length, preanal pores = precloacal pores, preanal = precloacal, tail measurements refer to original tails, max. size refers to maximum known, sometimes approximated up to the nearest 10 mm if number of measured specimens is below 10.

While numerous texts and references were consulted prior to publication of this paper, the criteria used to separate the relevant genera, subgenera, species or subspecies has already been spelt out and/or is done so within each formal description and does not rely on material within publications not explicitly cited herein.

DEFINITIONS

These apply throughout this paper.

Otway Ranges and Otways are different ways to identify the same biogeographical feature in south-west Victoria, being a coastal mountain range that rises abruptly from the sea to the south (Bass Strait), being an area of relatively flat low-lying land at times of glacial maxima. The Otways are generally bounded by the low clay and sand based hills to the west of Airey's Inlet in the East, these hills grading to clay or sand and being reduced to flat land east of Anglesea and including the rest of the extant Bellarine Peninsula, in turn being covered in basaltic lava flows to the north; the Gillibrand River to the west and north-west forms this boundary of the Otways, Bass strait in the south and a line from Torquay to Colac, across generally flat land and including basaltic lava flows in the north-east, complete the surrounding boundaries of the Otways.

The core of the Otway ranges is the Early Cretaceous Eumeralla Formation, dated at about 145 MYA to 100 MYA consisting of sandstones, siltstones, mudstones and similar sedimentary rocks, which combined with the steep slopes, higher altitude and southerly location, means the region is composed of heavily forested hills, with rock outcrops along watercourses, in stark contrast to the generally flat and dry areas to the north, east and west of these ranges and also south, when proximal parts of Bass Strait was largely exposed flat-lands (Miner and Rosengren, 2019).

The Grampians are a set of ancient and eroded mountains and large hills in the west of Victoria composed of sandstone which was laid down from large rivers during the Devonian period 425-415 million years ago. This sediment slowly accumulated to a depth of 7 kilometres (4.3 miles) which was later raised and tilted for its present form (Calder, 1987). They lie west of Ararat and Stawell, south of Horsham, east of Edenhope and north of Hamilton, all being within western Victoria.

ANEPISCHETOSIA SHIREENHOSERAE SP. NOV.

LSIDURN:LSID:ZOOBANK.ORG:ACT:9F079D17-6F4C-4BF1-9E0E-B6F24D124039

Holotype: A preserved specimen at the National Museum of Victoria, Melbourne, Victoria, Australia, specimen number D34738 collected 1.6 km North of Cape Horn in the Otway Ranges, Victoria, Australia, Latitude -38.73 S., Longitude 143.62 E. This government-owned facility allows access to its holdings.

Paratype: A preserved specimen at the National Museum of Victoria, Melbourne, Victoria, Australia, specimen number D34778 collected from 3.2 km North of Cape Horn in the Otway Ranges, Victoria, Australia, Latitude -38.7 S., Longitude 143.62 E.

Diagnosis: *Anepischetosia shireenhoserae sp. nov.* has until now been treated as a population of the widespread putative species *Anepischetosia maccoyi* (Lucas and Frost, 1894). *A. shireenhoserae sp. nov.* is wholly confined to the Otway Ranges of Victoria as defined previously in this paper.

Anepischetosia simonkortlangi sp. nov. also previously treated as a population of *A. maccoyi* occurs between Burk's Island 7km East of Beachport, South Australia in the west, Warrnambool, Victoria in the east and the Grampians, Victoria in the north, also occurring within the Grampians, the Grampians as a biogeographic entity being defined elsewhere in this paper.

A. shireenhoserae sp. nov. is separated from all other species within the *A. maccoyi* species complex, including *A. simonkortlangi sp. nov.*, *A. maccoyi* (Lucas and Frost, 1894) from eastern Victoria, *A. sharmani* (Wells and Wellington, 1984) from the Illawarra Escarpment and *A. brindabellaensis* Wells and Wellington, 1985 from the Brindabella Ranges, west of Canberra on the border of the ACT and NSW, by the following unique suite of characters:

Iris red; venter yellow; spots forming two longitudinal stripes, orange-red in colour on either side of the upper surface of the tail; about four alternating and obvious, well-defined dark greyish, and light whitish bands on the lower labials; anterior of snout is light brown (versus a darker body).

A. simonkortlangi sp. nov. is readily separated from all other species within the *A. maccoyi* species complex by the following unique suite of characters:

Dull orange-yellow iris; a dorsum that is a light brownish-grey colour (as opposed to an obvious chocolate brown type of colour or dark greyish-brown in all other species); the upper lateral edge of the body has a well defined black upper edge, against a dark brown dorsum, this dark edge usually covering the upper part of the lateral flank and the tail, and always forming at least a thick black line, with the surface below this (lower flanks) being whitish in colour, this not being the case in all other species in the *A. maccoyi* species complex; upper surface of the head is unicolour, being the same lightish colour of the body or slightly darker with a grey hue, but no obvious peppering; upper surface of anterior tail, has two obvious rows of black dots running either side of the midline and two less well defined similar lines of black dots on the border of the upper surface and flank of the anterior tail; no distinct or indistinct white spots or flecks on the upper surface of the body; no red spots on the tail or body; upper labial region both in front of and behind the eye is a

unicolour greyish.

A. maccoyi is separated from all other species within the *A. maccoyi* species complex by the following unique suite of characters:
Iris is yellow-orange, rarely darker; venter light orange; large joined spots forming two longitudinal stripes, greyish-black in colour on either side of the upper surface of the tail; any red or whitish spots or marks on tail, are not part of any longitudinal lines and are otherwise scattered; lower labials are mainly greyish with a number of ill defined cream coloured spots or blotches or rarely barred; anterior of snout is heavily peppered grey

A. sharmani is separated from all other species within the *A. maccoyi* species complex by the following unique suite of characters:

Iris is orange; venter variable in colour, but usually orange; except for a light yellow brown line running either side of the dorsum of the lower body onto the tail, there are no spots forming two longitudinal stripes that are different in colour than the rest of the upper surface of the tail; upper labials have two to four tiny white spots or bars, all fully encircled with dark brown, with the possible exception of the rear two, which sometimes extend under the chin; anterior of snout is dark brown with some peppering; the tail has irregularly scattered red spots, but these do not form longitudinal lines.

A. brindabellaensis is separated from all other species within the *A. maccoyi* species complex by the following unique suite of characters: Brownish iris; the upper lateral edge of the body has a well defined black upper edge, against a dark brown dorsum, this dark edge usually covering the upper part of the lateral flank and the tail, and always forming at least a thick black line, with the surface below this (the lower flanks) being brownish in colour this not being the case in all other species in the *A. maccoyi* species complex; upper surface of dorsum is peppered with tiny indistinct white spots.

A. shireenhoserae sp. nov. in life can be found depicted online at:
https://www.inaturalist.org/observations/70630763
and
https://www.inaturalist.org/observations/64470225

A. simonkortlangi in life can be found depicted online at:
https://www.inaturalist.org/observations/62548840
and
https://www.inaturalist.org/observations/100638337
and
https://www.inaturalist.org/observations/66599370

A. maccoyi in life can be found depicted online at:
https://www.flickr.com/photos/zimny_anders/49387622433/
and
https://www.flickr.com/photos/zimny_anders/49387623978/
and
https://www.flickr.com/photos/zimny_anders/49388301007/
and
https://www.inaturalist.org/observations/39196571
and
https://www.inaturalist.org/observations/41592421
and
https://www.inaturalist.org/observations/39221867
and
https://www.inaturalist.org/observations/35844959

A. sharmani in life can be found depicted in Swan, Shea and Sadlier (2004) on page 174, Swanson (2007) on page 185 at bottom and online at:
https://www.inaturalist.org/observations/39139976
and
https://www.inaturalist.org/observations/95233386
and
https://www.inaturalist.org/observations/2383151
and
http://arod.net.au/arod/reptilia/Squamata/Scincidae/Anepischetosia/maccoyi

A. brindabellaensis in life can be found depicted in Hoser (1989) on page 99 at top, or in Jenkins and Bartell (1980) at page 150 and online at:
https://canberra.naturemapr.org/sightings/2727379
and
https://canberra.naturemapr.org/sightings/4237846

All five named species in the *A. maccoyi* species complex, including *A. maccoyi*, *A. shireenhoserae sp. nov.*, *A. simonkortlangi sp. nov.*, *A. sharmani* and *A. brindabellaensis*, which in total comprise the entirety of the genus *Anepischetosia* Wells and Wellington, 1985, are readily separated from all other Australasian skinks by the following unique combination of characters: Moderate limbs that just fail to meet when adpressed; supranasals absent; nasals are small, undivided and separated; prefrontals usually absent; parietal shields in contact behind the interparietal; lower eyelid is movable with a small transparent disc; tiny ear opening that is punctiform and distinct; preanals enlarged; limbs pentadactyle (modified from Cogger 2014).

Distribution: *A. shireenhoserae sp. nov.* has a distribution centred on the Otway Ranges of southern Victoria, effectively confined to this area, being an area bounded by the low clay and sand based hills to the west of Airey's Inlet in the East, these hills grading to clay or sand and being reduced to flat land east of Anglesea and including the rest of the extant Bellarine Peninsula, in turn being covered in basaltic lava flows to the north; the Gillibrand River to the west and north-west forms this boundary of the Otways, Bass strait in the south and a line from Torquay to Colac, across generally flat land and including basaltic lava flows in the north-east, complete the surrounding boundaries of the Otways.

The core of the Otway ranges is the Early Cretaceous Eumeralla Formation, dated at about 145 MYA to 100 MYA consisting of sandstones, siltstones, mudstones and similar sedimentary rocks, which combined with the steep slopes, higher altitude and southerly location, means the region is composed of heavily forested hills, with rock outcrops along watercourses, in stark contrast to the generally flat and dry areas to the north, east and west of these ranges (with much smaller trees and generally more sparse vegetation) and also south, when proximal parts of Bass Strait was largely exposed flat-lands (Miner and Rosengren, 2019).

Etymology: The species *A. shireenhoserae sp. nov.* is named in honour of my long suffering wife, Shireen Hoser, of Park Orchards, Victoria, Australia, originally from Athlone in South Africa in recognition of decades of services to herpetology in numerous ways.

ANEPISCHETOSIA SIMONKORTLANGI SP. NOV.

LSIDURN:LSID:ZOOBANK.ORG:ACT:379E9427-AB4F-46DE-87D1-858E11553CE0

Holotype: A preserved specimen at the National Museum of Victoria, Melbourne, Victoria, Australia, specimen number D14726 collected from Ink Bottle, Kentbruck, Victoria, Australia, Latitude -38.139 S., Longitude 141.285 E. This government-owned facility allows access to its holdings.

Paratype: A preserved specimen at the National Museum of Victoria, Melbourne, Victoria, Australia, specimen number D14727 collected from Ink Bottle, Kentbruck, Victoria, Australia, Latitude -38.139 S., Longitude 141.285 E.

Diagnosis: *Anepischetosia simonkortlangi sp. nov.* which until now has been treated as a population of *A. maccoyi* occurs between Burk's Island 7km East of Beachport, South Australia in the west, Warrnambool, Victoria in the east and the Grampians, Victoria in the north, also occurring within the Grampians, the

***Anepischetosia shireenhoserae sp. nov.* in life.**
Top photo of dorsum and bottom photo showing venters of same specimens.
Photos: Raymond Hoser.

Hoser 2022 - Australasian Journal of Herpetology 56:3-21.

Grampians as a biogeographic entity being defined elsewhere in this paper.

Anepischetosia shireenhoserae sp. nov. has also until now been treated as a population of the widespread putative species *Anepischetosia maccoyi* (Lucas and Frost, 1894). *A. shireenhoserae sp. nov.* is wholly confined to the Otway Ranges of Victoria as defined previously in this paper.

A. simonkortlangi sp. nov. is readily separated from all other species within the *A. maccoyi* species complex by the following unique suite of characters:

Dull orange-yellow iris; a dorsum that is a light brownish-grey colour (as opposed to an obvious chocolate brown type of colour or dark greyish-brown in all other species); the upper lateral edge of the body has a well defined black upper edge, against a dark brown dorsum, this dark edge usually covering the upper part of the lateral flank and the tail, and always forming at least a thick black line, with the surface below this (lower flanks) being whitish in colour, this not being the case in all other species in the *A. maccoyi* species complex; upper surface of the head is unicolour, being the same lightish colour of the body or slightly darker with a grey hue, but no obvious peppering; upper surface of anterior tail, has two obvious rows of black dots running either side of the midline and two less well defined similar lines of black dots on the border of the upper surface and flank of the anterior tail; no distinct or indistinct white spots or flecks on the upper surface of the body; no red spots on the tail or body; upper labial region both in front of and behind the eye is a unicolour greyish.

A. shireenhoserae sp. nov. is separated from all other species within the *A. maccoyi* species complex, including *A. simonkortlangi sp. nov.*, *A. maccoyi* (Lucas and Frost, 1894) from eastern Victoria, *A. sharmani* (Wells and Wellington, 1984) from the Illawarra Escarpment and *A. brindabellaensis* Wells and Wellington, 1985 from the Brindabella Ranges, west of Canberra on the border of the ACT and NSW, by the following unique suite of characters:

Iris red; venter yellow; spots forming two longitudinal stripes, orange-red in colour on either side of the upper surface of the tail; about four alternating and obvious, well-defined dark greyish, and light whitish bands on the lower labials; anterior of snout is light brown (versus a darker body).

A. maccoyi is separated from all other species within the *A. maccoyi* species complex by the following unique suite of characters:

Iris is yellow-orange, rarely darker; venter light orange; large joined spots forming two longitudinal stripes, greyish-black in colour on either side of the upper surface of the tail; any red or whitish spots or marks on tail, are not part of any longitudinal lines and are otherwise scattered; lower labials are mainly greyish with a number of ill defined cream coloured spots or blotches or rarely barred; anterior of snout is heavily peppered grey

A. sharmani is separated from all other species within the *A. maccoyi* species complex by the following unique suite of characters:

Iris is orange; venter variable in colour, but usually orange; except for a light yellow brown line running either side of the dorsum of the lower body onto the tail, there are no spots forming two longitudinal stripes that are different in colour than the rest of the upper surface of the tail; upper labials have two to four tiny white spots or bars, all fully encircled with dark brown, with the possible exception of the rear two, which sometimes extend under the chin; anterior of snout is dark brown with some peppering; the tail has irregularly scattered red spots, but these do not form longitudinal lines.

A. brindabellaensis is separated from all other species within the *A. maccoyi* species complex by the following unique suite of characters: Brownish iris; the upper lateral edge of the body has a well defined black upper edge, against a dark brown dorsum, this dark edge usually covering the upper part of the lateral flank and the tail, and always forming at least a thick black line, with the surface below this (the lower flanks) being brownish in colour this not being the case in all other species in the *A. maccoyi* species complex; upper surface of dorsum is peppered with tiny indistinct white spots.

A. shireenhoserae sp. nov. in life can be found depicted online at:
https://www.inaturalist.org/observations/70630763
and
https://www.inaturalist.org/observations/64470225

A. simonkortlangi in life can be found depicted online at:
https://www.inaturalist.org/observations/62548840
and
https://www.inaturalist.org/observations/100638337
and
https://www.inaturalist.org/observations/66599370

A. maccoyi in life can be found depicted online at:
https://www.flickr.com/photos/zimny_anders/49387622433/
and
https://www.flickr.com/photos/zimny_anders/49387623978/
and
https://www.flickr.com/photos/zimny_anders/49388301007/
and
https://www.inaturalist.org/observations/39196571
and
https://www.inaturalist.org/observations/41592421
and
https://www.inaturalist.org/observations/39221867
and
https://www.inaturalist.org/observations/35844959

A. sharmani in life can be found depicted in Swan, Shea and Sadlier (2004) on page 174, Swanson (2007) on page 185 at bottom and online at:
https://www.inaturalist.org/observations/39139976
and
https://www.inaturalist.org/observations/95233386
and
https://www.inaturalist.org/observations/2383151
and
http://arod.net.au/arod/reptilia/Squamata/Scincidae/Anepischetosia/maccoyi

A. brindabellaensis in life can be found depicted in Hoser (1989) on page 99 at top, or in Jenkins and Bartell (1980) at page 150 and online at:
https://canberra.naturemapr.org/sightings/2727379
and
https://canberra.naturemapr.org/sightings/4237846

All five named species in the *A. maccoyi* species complex, including *A. maccoyi*, *A. shireenhoserae sp. nov.*, *A. simonkortlangi sp. nov.*, *A. sharmani* and *A. brindabellaensis*, which in total comprise the entirety of the genus *Anepischetosia* Wells and Wellington, 1985, are readily separated from all other Australasian skinks by the following unique combination of characters: Moderate limbs that just fail to meet when adpressed; supranasals absent; nasals are small, undivided and separated; prefrontals usually absent; parietal shields in contact behind the interparietal; lower eyelid is movable with a small transparent disc; tiny ear opening that is punctiform and distinct; preanals enlarged; limbs pentadactyle (modified from Cogger 2014).

Distribution: *Anepischetosia simonkortlangi sp. nov.* occurs between Burk's Island 7km East of Beachport, South Australia in the west, Warrnambool, Victoria in the east and the northern limits of the Grampians, Victoria in the north, this taxon also occurring within the Grampians, the Grampians as a biogeographic entity being defined elsewhere in this paper.

Etymology: *A. simonkortlangi sp. nov.* is named in honour of Simon Kortlang of South Yarra, Victoria, Australia, previously of Canterbury, Victoria, Australia in recognition of his services to herpetology.

In the 1980's and 1990's he was a prominent member of the Victorian Herpetological Society Incorporated at a time when draconian wildlife laws across Australia were being rewritten as a result of the publication of the "*Smuggled*" books (Hoser 1993 and Hoser 1996).

Besides successfully assisting in having laws changed in the State of Victoria to allow people to legally keep various species of native reptiles in captivity for the first time in decades, which is now taken for granted by many younger herpetologists, Kortlang also was the first to breed in large numbers, species and mutations of pythons now commonplace in captivity, including Top-end of Northern Territory form of Carpet Pythons.

While many prominent Victorian herpetologists are effectively removed from the field of herpetology by corrupt government wildlife department officers seeking to remove potential competitors to their own employed "scientists" or their dysfunctional "zoo" businesses like "Zoos Victoria" (think of names like Fritz Maaten, Andy Stevens, Vicki Lowing, Rob Jealous, all of whom were removed from herpetology because they were "too successful"), Kortlang was effectively removed from herpetology by an unusual set of circumstances. This was a series of medical disasters leading to removal of much of his digestive tract and unrelated medical issues causing him to have near total blindness, thereby effectively terminating his ability to keep reptiles or work with them, or to publish on them.

PSEUDEMOIA DANIELMANNIXI SP. NOV.

LSIDURN:LSID:ZOOBANK.ORG:ACT:A89B6C20-2274-4BAE-BCD0-06E10E485F2F

Holotype: A preserved specimen at the National Museum of Victoria, Melbourne, Victoria, Australia, specimen number D13621 collected from Mount Sabine, Otway Ranges, Victoria, Australia, Latitude -38.62 S. Longitude 143.73 E. This government facility allows access to its holdings.

Paratypes: Nine preserved specimens at the National Museum of Victoria, Melbourne, Victoria, Australia, specimen numbers D13622-30 collected from Mount Sabine, Otway Ranges, Victoria, Australia, Latitude -38.62 S. Longitude 143.73 E.

Diagnosis: Until now, all of *Pseudemoia spenceri* (Lucas and Frost, 1894), *P. weekesae* (Kinghorn, 1929), *P. danielmannixi sp. nov.*, *P. mcnamarai sp. nov.* and *P. davidkerryi sp. nov.* have been regarded by virtually all herpetologists as being of a single species, namely *P. spenceri.*

Within the last 50 years the only exception to this has been Wells and Wellington (1985), who resurrected from synonymy *P. weekesae*, but did not publish a reason for doing so.

No herpetologist, published or otherwise, had prior to the publication of this paper countenanced the possibility of further unnamed species within *Pseudemoia* Fuhn, 1967 *sensu stricto* other than myself immediately prior to the publication of this paper.

This is surprising as the molecular phylogeny of Haines *et al.* (2014) at Fig. 3, provided excellent evidence that there was in fact at least 3 species in the genus, based on just three divergent samples, these representing the nominate form of *P. spenceri*, as well as *P. weekesae* and the form described herein as *P. davidkerryi sp. nov..*

The biogeographical event of a biblical scale, being the volcanism in western Victoria, peaking 3-5 MYA, clearly isolated the two main west Victorian populations a long time ago, allowing for significant morphological divergence to occur, with the divergence clearly sufficient to make these forms separate allopatric species.

The five species formally treated as *Pseudemoia spenceri* (Lucas and Frost, 1894), are as follows:

1/ *Pseudemoia spenceri* (Lucas and Frost, 1894), is confined to the highlands east of Melbourne in eastern Victoria, generally south and west of what is now Lake Eildon.

2/ *P. weekesae* (Kinghorn, 1929) is confined to the Snowy Mountains region of New South Wales and possibly adjacent parts of far north-east Victoria. The lizards of this putative taxon found in the Brindabella Ranges are morphologically similar to the type form and are herein tentatively referred to the same species.

3/ *P. danielmannixi sp. nov*. is effectively confined to the Otway Ranges in south-west Victoria as defined elsewhere in this paper.

4/ *P. mcnamarai sp. nov.* occurs in the Grampians as defined elsewhere in this paper and east of there in the large hills north of Ararat, in western Victoria (e.g. Mount Buangor State Park).

5/ *P. davidkerryi sp. nov.* is the taxon from the western edge of the Blue Mountains and nearby areas. Specimens from the Illawarra escarpment are also tentatively referred to this species.

The five species are readily separated from one another by the following unique suites of characters:

1/ *P. spenceri* is readily separated from the four other species by the following unique combination of characters:

Dorsum that in the mid line section is clearly marbled in markings, colouration and texture (this marbling not being seen in any of the other species), being more brown than blackish; there is a thick, well defined and unbroken cream stripe running down each side of the upper surface at the interface between dorsum and flanks (slightly broken rarely); flanks blackish with numerous small cream spots of irregular shape; no obvious barring or markings on the upper labials; black or grey peppering on head is heavy, and may join to form blotches.

2/ *P. weekesae* (Kinghorn, 1929) is readily separated from the four other species by the following unique suite of characters:

A dorsum that is mainly blackish in colour, with a concentration of medium brown spots or whitish spots running down the mid section of the spine (occasionally with a distinctive cream mid-dorsal stripe); a thin, but well defined whitish yellow line running on either side of the dorsum on the interface between the upper surface and the flanks; the flanks themselves are mainly black, but with a small number of tiny brown spots on the anterior end of the body; spots or markings on the labials are small and barely noticeable; snout anterior to the eyes is noticeably lighter and a mainly light brown colour with limited speckling or flecks.

3/ *P. danielmannixi sp. nov.* is readily separated from the four other species by the following unique suite of characters:

Well defined barring on the upper labials; dorsum is about 50 percent creamish, versus not so in the other species; the upper surface is then overlain with black, in turn with numerous creamish spots throughout; the midline is creamish, as is the two lines on either side of the dorsum, bounding the flanks; all markings on the dorsum are clear and not marbled in nature; flanks are black, but with well defined creamish spots from anterior to posterior of the body; head is brown and boldly peppered black; a distinctive blackish triangle between nostril and eye, the widest point near the eye; markings on the upper surfaces of the forelimbs are not in the form of white spots.

4/ *P. mcnamarai sp. nov.* is readily separated from the four other species by the following unique suite of characters:

Main surface of flanks are black and without any obvious spotting or flecks (rarely with distinct flecks); forelimbs with white spots; dorsum is mainly black, but with well defined cream spots in the black area; the upper surface of the head is all or mainly black; body stripes, including those on the upper flank/dorsum interface and lower flank are white or whitish, well-defined and continuous. Upper labials creamish and without barring.

5/ *P. davidkerryi sp. nov.* is readily separated from the four other species by the following unique suite of characters:

Brown head and upper neck (peppered black), rapidly transforming (at the back of the skull) to a black upper body with numerous evenly scattered, distinct, tiny white spots throughout,

the same colouration being on the flanks and the limbs, with the body stripes reduced so as to be barely distinguishable from the other areas, meaning that the stripe between upper surface of dorsum and upper flank is wholly broken up and consists of little more than spotting in the same way as other areas of the dorsum, or if the dorso-lateral lines are present they are either thin, indistinct, or broken..

This colouration of the dorsum, gives this species a very different appearance to all the other four species.

Flanks in some specimens lacks white spotting, but the dorsum remains as just described.

The white spotting is not on the head, which is light brown and peppered black. Upper surfaces of the limbs are black with distinct white spots.

P. spenceri in life is depicted online at:
https://www.flickr.com/photos/whawha88/17093355776/
and
https://www.inaturalist.org/observations/39222713
and
https://www.inaturalist.org/observations/70133372
and
https://www.inaturalist.org/observations/28985995

P. weekesae in life is depicted in Hoser (1989) on page 106 at top left, Jenkins and Bartell (180) on page 183, Swanson (2007) on page 190, Cogger (2014) on page 676 at bottom right and online at:
https://www.inaturalist.org/observations/8760539
and
https://www.flickr.com/photos/bumblebc/5992749933/

P. danielmannixi sp. nov. is depicted in life online at:
https://www.inaturalist.org/observations/92214028
and
https://www.inaturalist.org/observations/66038997
and
https://www.inaturalist.org/observations/92042681
and
https://www.inaturalist.org/observations/68794018
and
https://www.inaturalist.org/observations/71178461

P. mcnamarai sp. nov. is depicted in life online at:
https://www.flickr.com/photos/190014189@N06/51745004112/
and
https://www.inaturalist.org/observations/58403164
and
https://www.inaturalist.org/observations/91237112
and
https://www.inaturalist.org/observations/84210421
and
https://www.inaturalist.org/observations/103038172

P. davidkerryi sp. nov. is depicted in life in Swan, Shea and Sadlier (2004) on page 183 and online at:
https://www.inaturalist.org/observations/65398425

The Pedra Branca Skink, *Pseudemoia palfreymani* Rawlinson, 1974 is separated from the preceding five species by having fused as opposed to separate frontoparietals.

P. palfreymani is depicted in life in Hoser (1991) on page 93 top.

The genus *Pseudemoia* Fuhn, 1967, *sensu stricto*, as defined herein, was diagnosed by Rawlinson (1974), and is confined to the six preceding species.

That diagnosis is adopted herein with minor refinement.

The six species within *Pseudemoia* Fuhn, 1967 are separated from all other Australasian skinks, including morphologically similar species at times included in this genus by the following unique suite of characters:

They are small to moderately large skinks (snout-vent length 2-4-8-5 cm), head and body flattened, tail round. Limbs pentadactyl, well developed and overlap when adpressed. Digits not elongate, 20-28 lamellae under the fourth toe, palmar tubercles flattened. Body scales small, smooth, the dorsal and lateral scales with 3-5 very faint keels, midbody scales in 37-48 rows. Lower eyelid moveable with a well developed transparent palpebral disc surrounded by small granular scales. External ear opening moderately large with 2-4 enlarged anterior lobules. A pair of supranasal scales invariably present, separated medially by the frontonasal. A small postnasal is present, normally fused to the supranasal scale (always present) in *P. spenceri* (85% of the time based on Rawlinson, 1974) but free in all *P. palfreymani* Rawlinson, 1974 specimens examined by Rawlinson (1974). Prefrontals enlarged but barely contact or fail to contact along the midline. Frontoparietals are separate in all species except for *P. palfreymani* in which they are fused. Interparietal always separate. Parietals large and meet along midline.

Distribution: *P. danielmannixi sp. nov.* is effectively confined to the Otway Ranges in south-west Victoria as defined elsewhere in this paper.

Etymology: Named in honour of Daniel Mannix of Sunbury, Victoria, Australia (as of 2021), owner and director of the Victorian Dog Training Academy ® (VDTA), who has saved the lives of countless dogs working with Snakebusters: Australia's best reptiles ® with world first Snake Avoidance ® training, using vet certified devenomized snakes (venomoids), being the only people in Australia offering such training to save the lives of dogs.

Unlike fake Snake Avoidance training offered by trademark infringing thieves using non-venomous pythons, who continue to operate in Australia in breach of multiple court orders, Snake Avoidance ® training using the exact venomous species likely to kill dogs does in fact work!

The Snake Avoidance ® training does not just save dogs lives, but also the lives of the snakes that would otherwise be attacked and killed by people's domestic pets.

Hence Daniel Mannix is being honoured for his major contribution to the conservation of reptiles!

PSEUDEMOIA MCNAMARAI SP. NOV.

LSIDURN:LSID:ZOOBANK.ORG:ACT:93C59DF7-3C04-4F1D-80F9-CC0B35838FD5

Holotype: A preserved adult male specimen at the National Museum of Victoria, Melbourne, Victoria, Australia, specimen number D56382 collected from the Grampians, Victoria, Australia, Latitude -37.12 S., Longitude 142.43 E. This government facility allows access to its holdings.

Paratype: A preserved specimen at the National Museum of Victoria, Melbourne, Victoria, Australia, specimen number D56383 collected from the Grampians, Victoria, Australia, Latitude -37.12 S., Longitude 142.43 E.

Diagnosis: Until now, all of *Pseudemoia spenceri* (Lucas and Frost, 1894), *P. weekesae* (Kinghorn, 1929), *P. danielmannixi sp. nov.*, *P. mcnamarai sp. nov.* and *P. davidkerryi sp. nov.* have been regarded by virtually all herpetologists as being of a single species, namely *P. spenceri*.

Within the last 50 years the only exception to this has been Wells and Wellington (1985), who resurrected from synonymy *P. weekesae*, but did not publish a reason for doing so.

No herpetologist, published or otherwise, had prior to the publication of this paper countenanced the possibility of further unnamed species within *Pseudemoia* Fuhn, 1967 *sensu stricto* other than myself immediately prior to the publication of this paper.

This is surprising as the molecular phylogeny of Haines *et al.* (2014) at Fig. 3, provided excellent evidence that there was in fact at least 3 species in the genus, based on just three divergent samples, these representing the nominate form of *P. spenceri*, as well as *P. weekesae* and the form described herein as *P. davidkerryi sp. nov.*.

The biogeographical event of a biblical scale, being the volcanism in western Victoria, peaking 3-5 MYA, clearly isolated the two main west Victorian populations a long time ago, allowing for significant morphological divergence to occur, with the divergence clearly sufficient to make these forms separate allopatric species.

The five species formally treated as *Pseudemoia spenceri* (Lucas and Frost, 1894), are as follows:

1/ *Pseudemoia spenceri* (Lucas and Frost, 1894), is confined to the highlands east of Melbourne in eastern Victoria, generally south and west of what is now Lake Eildon.

2/ *P. weekesae* (Kinghorn, 1929) is confined to the Snowy Mountains region of New South Wales and possibly adjacent parts of far north-east Victoria. The lizards of this putative taxon found in the Brindabella Ranges are morphologically similar to the type form and are herein tentatively referred to the same species.

3/ *P. danielmannixi sp. nov.* is effectively confined to the Otway Ranges in south-west Victoria as defined elsewhere in this paper.

4/ *P. mcnamarai sp. nov.* occurs in the Grampians as defined elsewhere in this paper and east of there in the large hills north of Ararat, in western Victoria (e.g. Mount Buangor State Park).

5/ *P. davidkerryi sp. nov.* is the taxon from the western edge of the Blue Mountains and nearby areas. Specimens from the Illawarra escarpment are also tentatively referred to this species.

The five species are readily separated from one another by the following unique suites of characters:

1/ *P. spenceri* is readily separated from the four other species by the following unique suite of characters:

Dorsum that in the mid line section is clearly marbled in markings, colouration and texture (this marbling not being seen in any of the other species), being more brown than blackish; there is a thick, well defined and unbroken cream stripe running down each side of the upper surface at the interface between dorsum and flanks (slightly broken rarely); flanks blackish with numerous small cream spots of irregular shape; no obvious barring or markings on the upper labials; black or grey peppering on head is heavy, that may join to form blotches.

2/ *P. weekesae* (Kinghorn, 1929) is readily separated from the four other species by the following unique suite of characters:

A dorsum that is mainly blackish in colour, with a concentration of medium brown spots or whitish spots running down the mid section of the spine (occasionally with a distinctive cream mid-dorsal stripe); a thin, but well defined whitish yellow line running on either side of the dorsum on the interface between the upper surface and the flanks; the flanks themselves are mainly black, but with a small number of tiny brown spots on the anterior end of the body; spots or markings on the labials are small and barely noticeable; snout anterior to the eyes is noticeably lighter and a mainly light brown colour with limited speckling or flecks.

3/ *P. danielmannixi sp. nov.* is readily separated from the four other species by the following unique suite of characters:

Well defined barring on the upper labials; dorsum is about 50% creamish, versus not so in the other species; the upper surface is then overlain with black, in turn with numerous creamish spots throughout; the midline is creamish, as is the two lines on either side of the dorsum, bounding the flanks; all markings on the dorsum are clear and not marbled in nature; flanks are black, but with well defined creamish spots from anterior to posterior of the body; head is brown and boldly peppered black; a distinctive blackish triangle between nostril and eye, the widest point near the eye; markings on the upper surfaces of the forelimbs are not in the form of white spots.

4/ *P. mcnamarai sp. nov.* is readily separated from the four other species by the following unique suite of characters:

Main surface of flanks are black and without any obvious spotting or flecks (rarely with distinct flecks); forelimbs with white spots; dorsum is mainly black, but with well defined cream spots in the black area; the upper surface of the head is all or mainly black; body stripes, including those on the upper flank/dorsum interface and lower flank are white or whitish, well-defined and continuous. Upper labials creamish and without barring.

5/ *P. davidkerryi sp. nov.* is readily separated from the four other species by the following unique suite of characters:

Brown head and upper neck (peppered black), rapidly transforming (at the back of the skull) to a black upper body with numerous evenly scattered, distinct, tiny white spots throughout, the same colouration being on the flanks and the limbs, with the body stripes reduced so as to be barely distinguishable from the other areas, meaning that the stripe between upper surface of dorsum and upper flank is wholly broken up and consists of little more than spotting in the same way as other areas of the dorsum, or if the dorso-lateral lines are present they are either thin, indistinct, or broken..

This colouration of the dorsum, gives this species a very different appearance to all the other four species.

Flanks in some specimens lacks white spotting, but the dorsum remains as just described

The white spotting is not on the head, which is light brown and peppered black. Upper surfaces of the limbs are black with distinct white spots.

P. spenceri in life is depicted online at:
https://www.flickr.com/photos/whawha88/17093355776/
and
https://www.inaturalist.org/observations/39222713
and
https://www.inaturalist.org/observations/70133372
and
https://www.inaturalist.org/observations/28985995

P. weekesae in life is depicted in Hoser (1989) on page 106 at top left, Jenkins and Bartell (180) on page 183, Swanson (2007) on page 190, Cogger (2014) on page 676 at bottom right and online at:
https://www.inaturalist.org/observations/8760539
and
https://www.flickr.com/photos/bumblebc/5992749933/

P. danielmannixi sp. nov. is depicted in life online at:
https://www.inaturalist.org/observations/92214028
and
https://www.inaturalist.org/observations/66038997
and
https://www.inaturalist.org/observations/92042681
and
https://www.inaturalist.org/observations/68794018
and
https://www.inaturalist.org/observations/71178461

P. mcnamarai sp. nov. is depicted in life online at:
https://www.flickr.com/photos/190014189@N06/51745004112/
and
https://www.inaturalist.org/observations/58403164
and
https://www.inaturalist.org/observations/91237112
and
https://www.inaturalist.org/observations/84210421
and
https://www.inaturalist.org/observations/103038172

P. davidkerryi sp. nov. is depicted in life in Swan, Shea and Sadlier (2004) on page 183 and online at:
https://www.inaturalist.org/observations/65398425

The Pedra Branca Skink, *Pseudemoia palfreymani* Rawlinson, 1974 is separated from the preceding five species by having fused as opposed to separate frontoparietals.

P. palfreymani is depicted in life in Hoser (1991) on page 93 top.

The genus *Pseudemoia* Fuhn, 1967, *sensu stricto*, as defined herein, was diagnosed by Rawlinson (1974), and is confined to the six preceding species.

That diagnosis is adopted herein with minor refinement.

The six species within *Pseudemoia* Fuhn, 1967 are separated from all other Australasian skinks, including morphologically similar species at times included in this genus by the following unique suite of characters:

They are small to moderately large skinks (snout-vent length 2-4-8-5 cm), head and body flattened, tail round. Limbs pentadactyl, well developed and overlap when adpressed. Digits not elongate, 20-28 lamellae under the fourth toe, palmar tubercles flattened. Body scales small, smooth, the dorsal and lateral scales with 3-5 very faint keels, midbody scales in 37-48 rows. Lower eyelid moveable with a well developed transparent palpebral disc surrounded by small granular scales. External ear opening moderately large with 2-4 enlarged anterior lobules. A pair of supranasal scales invariably present, separated medially by the frontonasal. A small postnasal is present, normally fused to the supranasal scale (always present) in *P. spenceri* (85% of the time based on Rawlinson, 1974) but free in all *P. palfreymani* Rawlinson, 1974 specimens examined by Rawlinson (1974). Prefrontals enlarged but barely contact or fail to contact along the midline. Frontoparietals are separate in all species except for *P. palfreymani* in which they are fused. Interparietal always separate. Parietals large and meet along midline.

Distribution: *P. mcnamarai sp. nov.* occurs in the Grampians as defined elsewhere in this paper and east of there in the large hills north of Ararat, in western Victoria (e.g. Mount Buangor State Park).

Etymology: Named in honour of Benny McNamara of Colac Victoria, Australia who in 2021 was operating a snake rescue service (Snake Catcher Colac), in recognition of his services to reptile conservation in Australia.

PSEUDEMOIA DAVIDKERRYI SP. NOV.

LSIDURN:LSID:ZOOBANK.ORG:ACT:E74394F6-11F4-4512-9C1A-4E74F8DD1501

Holotype: A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R1860 collected from the Jenolan Caves area, Blue Mountains, New South Wales, Australia, Latitude -33.816 S., Longitude 150.033 E. This government owned facility allows access to its holdings. The specimen was listed as a paratype for the species *Lygosoma* (*Leiolopisma*) *weekesae* Kinghorn, 1929 with a holotype specimen number R9745 in the Australian Museum, Sydney, Australia, collected from Mount Kosciusko (at 1,680 m elevation), NSW, Australia, collected by R. Helms in May 1889 (Rawlinson, 1974).

Paratypes: 34 preserved specimens at the Australian Museum, Sydney, New South Wales, Australia, specimen numbers R.149680-R.149694, R.149696-R.149705, R.149707-R.149708 and R.149710-R.149716 all collected from Hollanders Creek on Kanangra Rd, 15km North of Morong Creek in Kanangra Boyd National Park, New South Wales, Australia, Latitude -33.816 S., Longitude 150.033 E.

Diagnosis: Until now, all of *Pseudemoia spenceri* (Lucas and Frost, 1894), *P. weekesae* (Kinghorn, 1929), *P. danielmannixi sp. nov.*, *P. mcnamarai sp. nov.* and *P. davidkerryi sp. nov.* have been regarded by virtually all herpetologists as being of a single species, namely *P. spenceri.*

Within the last 50 years the only exception to this has been Wells and Wellington (1985), who resurrected from synonymy *P. weekesae*, but did not publish a reason for doing so.

No herpetologist, published or otherwise, had prior to the publication of this paper countenanced the possibility of further unnamed species within *Pseudemoia* Fuhn, 1967 *sensu stricto* other than myself immediately prior to the publication of this paper.

This is surprising as the molecular phylogeny of Haines *et al.* (2014) at Fig. 3, provided excellent evidence that there was in fact at least 3 species in the genus, based on just three divergent samples, these representing the nominate form of *P. spenceri*, as well as *P. weekesae* and the form described herein as *P. davidkerryi sp. nov.*.

The biogeographical event of a biblical scale, being the volcanism in western Victoria, peaking 3-5 MYA, clearly isolated the two main west Victorian populations a long time ago, allowing for significant morphological divergence to occur, with the divergence clearly sufficient to make these forms separate allopatric species.

The five species formally treated as *Pseudemoia spenceri* (Lucas and Frost, 1894), are as follows:

1/ *Pseudemoia spenceri* (Lucas and Frost, 1894), is confined to the highlands east of Melbourne in eastern Victoria, generally south and west of what is now Lake Eildon.

2/ *P. weekesae* (Kinghorn, 1929) is confined to the Snowy Mountains region of New South Wales and possibly adjacent parts of far north-east Victoria. The lizards of this putative taxon found in the Brindabella Ranges are morphologically similar to the type form and are herein tentatively referred to the same species.

3/ *P. danielmannixi sp. nov.* is effectively confined to the Otway Ranges in south-west Victoria as defined elsewhere in this paper.

4/ *P. mcnamarai sp. nov.* occurs in the Grampians as defined elsewhere in this paper and east of there in the large hills north of Ararat, in western Victoria (e.g. Mount Buangor State Park).

5/ *P. davidkerryi sp. nov.* is the taxon from the western edge of the Blue Mountains and nearby areas. Specimens from the Illawarra escarpment are also tentatively referred to this species.

The five species are readily separated from one another by the following unique suites of characters:

1/ *P. spenceri* is readily separated from the four other species by the following unique suite of characters:

Dorsum that in the mid line section is clearly marbled in markings, colouration and texture (this marbling not being seen in any of the other species), being more brown than blackish; there is a thick, well defined and unbroken cream stripe running down each side of the upper surface at the interface between dorsum and flanks (slightly broken rarely); flanks blackish with numerous small cream spots of irregular shape; no obvious barring or markings on the upper labials; black or grey peppering on head is heavy, which sometimes join to form blotches.

2/ *P. weekesae* (Kinghorn, 1929) is readily separated from the four other species by the following unique suite of characters:

A dorsum that is mainly blackish in colour, with a concentration of medium brown spots or whitish spots running down the mid section of the spine (occasionally with a distinctive cream mid-dorsal stripe); a thin, but well defined whitish yellow line running on either side of the dorsum on the interface between the upper surface and the flanks; the flanks themselves are mainly black, but with a small number of tiny brown spots on the anterior end of the body; spots or markings on the labials are small and barely noticeable; snout anterior to the eyes is noticeably lighter and a mainly light brown colour with limited speckling or flecks.

3/ *P. danielmannixi sp. nov.* is readily separated from the four other species by the following unique suite of characters:

Well defined barring on the upper labials; dorsum is about 50% creamish, versus not so in the other species; the upper surface is then overlain with black, in turn with numerous creamish spots throughout; the midline is creamish, as is the two lines on either side of the dorsum, bounding the flanks; all markings on the dorsum are clear and not marbled in nature; flanks are black, but with well defined creamish spots from anterior to posterior of the body; head is brown and boldly peppered black; a distinctive blackish triangle between nostril and eye, the widest point near the eye; markings on the upper surfaces of the forelimbs are not in the form of white spots.

4/ *P. mcnamarai sp. nov.* is readily separated from the four other species by the following unique suite of characters:

Main surface of flanks are black and without any obvious spotting or flecks (rarely with distinct flecks); forelimbs with white spots; dorsum is mainly black, but with well defined cream spots in the black area; the upper surface of the head is all or mainly black; body stripes, including those on the upper flank/dorsum interface and lower flank are white or whitish, well-defined and continuous. Upper labials creamish and without barring.

5/ *P. davidkerryi sp. nov.* is readily separated from the four other species by the following unique suite of characters:

Brown head and upper neck (peppered black), rapidly transforming (at the back of the skull) to a black upper body with numerous evenly scattered, distinct, tiny white spots throughout, the same colouration being on the flanks and the limbs, with the body stripes reduced so as to be barely distinguishable from the other areas, meaning that the stripe between upper surface of dorsum and upper flank is wholly broken up and consists of little more than spotting in the same way as other areas of the dorsum, or if the dorso-lateral lines are present they are either thin, indistinct, or broken..

This colouration of the dorsum, gives this species a very different appearance to all the other four species.

Flanks in some specimens lacks white spotting, but the dorsum remains as just described

The white spotting is not on the head, which is light brown and peppered black. Upper surfaces of the limbs are black with distinct white spots.

P. spenceri in life is depicted online at:
https://www.flickr.com/photos/whawha88/17093355776/
and
https://www.inaturalist.org/observations/39222713
and
https://www.inaturalist.org/observations/70133372
and
https://www.inaturalist.org/observations/28985995

P. weekesae in life is depicted in Hoser (1989) on page 106 at top left, Jenkins and Bartell (180) on page 183, Swanson (2007) on page 190, Cogger (2014) on page 676 at bottom right and online at:
https://www.inaturalist.org/observations/8760539
and
https://www.flickr.com/photos/bumblebc/5992749933/

P. danielmannixi sp. nov. is depicted in life online at:
https://www.inaturalist.org/observations/92214028
and
https://www.inaturalist.org/observations/66038997
and
https://www.inaturalist.org/observations/92042681
and
https://www.inaturalist.org/observations/68794018
and
https://www.inaturalist.org/observations/71178461

P. mcnamarai sp. nov. is depicted in life online at:
https://www.flickr.com/photos/190014189@N06/51745004112/
and
https://www.inaturalist.org/observations/58403164
and
https://www.inaturalist.org/observations/91237112
and
https://www.inaturalist.org/observations/84210421
and
https://www.inaturalist.org/observations/103038172

P. davidkerryi sp. nov. is depicted in life in Swan, Shea and Sadlier (2004) on page 183 and online at:
https://www.inaturalist.org/observations/65398425

The Pedra Branca Skink, *Pseudemoia palfreymani* Rawlinson, 1974 is separated from the preceding five species by having fused as opposed to separate frontoparietals.

P. palfreymani is depicted in life in Hoser (1991) on page 93 at the top.

The genus *Pseudemoia* Fuhn, 1967, *sensu stricto*, as defined herein, was diagnosed by Rawlinson (1974), and is confined to the six preceding species.

That diagnosis is adopted herein with minor refinement.

The six species within *Pseudemoia* Fuhn, 1967 are separated from all other Australasian skinks, including morphologically similar species at times included in this genus by the following unique suite of characters:

They are small to moderately large skinks (snout-vent length 2-4-8-5 cm), head and body flattened, tail round. Limbs pentadactyl, well developed and overlap when adpressed. Digits not elongate, 20-28 lamellae under the fourth toe, palmar tubercles flattened. Body scales small, smooth, the dorsal and lateral scales with 3-5 very faint keels, midbody scales in 37-48 rows. Lower eyelid moveable with a well developed transparent palpebral disc surrounded by small granular scales. External ear opening moderately large with 2-4 enlarged anterior lobules. A pair of supranasal scales invariably present, separated medially by the frontonasal. A small postnasal is present, normally fused to the supranasal scale (always present) in *P. spenceri* (85% of the time based on Rawlinson, 1974) but free in all *P. palfreymani* Rawlinson, 1974 specimens examined by Rawlinson (1974). Prefrontals enlarged but barely contact or fail to contact along the midline. Frontoparietals are separate in all species except for *P. palfreymani* in which they are fused. Interparietal always separate. Parietals large and meet along midline.

Distribution: *P. davidkerryi sp. nov.* occurs on the western edge of the Blue Mountains and nearby areas. Specimens from the Illawarra escarpment are also tentatively referred to this species.

Etymology: Named in honour of David Kerry, who in 2021 lived in Carlton, Victoria, but who spent time in New South Wales, Queensland and the Northern Territory in recognition of decades of work in herpetology in Australia, including for example assisting in the sourcing of reptiles to photograph for the book *Australian Reptiles and Frogs*, published in 1989 (Hoser, 1989).

MCPHIEUS GEN. NOV.

LSIDurn:lsid:zoobank.org:act:0E1BF95D-48D5-4E51-B7D5-A33B89A95D1C

Type species: *Mcphieus hadynmcphiei sp. nov.*

Diagnosis: The five species within the genus *Mcphieus gen. nov.* are readily separated from all other species of Australian skink by the following unique suite of characters: small, active diurnal, smooth-scaled skinks characterised by: well developed pentadactyle limbs that meet or overlap when adpressed, or which fail to meet by no more than one or two scale-lengths; ear opening prominent with anterior lobules present; supranasals present or absent; parietal shields in contact behind the interparietal; distinct frontoparietals; movable lower eyelids with a transparent disc being almost as large as the eye; 23-30 mid-body rows; less than 30 lamellae under the fourth toe; a pale dorso-lateral stripe (usually, but not always) distinct on the third scale row of the midline of the back being a part of a distinctive pattern of light and dark stripes.

Species within the closely related genus *Pseudemoia* Fuhn, 1967 are similar in most respects to *Mcphieus gen. nov.*, but readily separated from that genus by the presence of 37-48 mid-body scale rows (vs 23-30 in *Mcphieus gen. nov.*) as well as always having supranasal scales present, no distinct frontoparietals and a flattened body.

Species within the closely related genus *Claireascincus* Wells and Wellington, 1985 are readily separated from both preceding genera by having 26-34 mid-body rows, no distinct frontoparietals and a pale dorso-lateral stripe on the fourth, or third and fourth scale row from the midline of the back.

Distribution: Southern Australia along the coastal fringe extending east from eastern Western Australia extending through southern South Australia to north-east Tasmania, north-east Victoria, south-east New South Wales and the western Australian Capital Territory.

Etymology: *Mcphieus gen. nov.* is named in honour of Hadyn McPhie of Mirboo North in Gippsland, Victoria, Australia in recognition of a lifetime's services to herpetology. Other species named in his honour have had different spellings in the epithet, but in this case the species name for *Mcphieus hadynmcphiei sp. nov.,* reflects the unusual and correct spelling of his name. None of the previous names as formally proposed by myself relevant to Hadyn McPhie should have their spellings altered.

Content: *Mcphieus hadynmcphiei sp. nov.* (type species); *M. baudini* (Greer, 1982); *M. michaelmatheri sp. nov.*; *M. rawlinsoni* (Hutchinson and Donnellan, 1988); *M. scottgranti sp. nov.*.

MCPHIEUS HADYNMCPHIEI SP. NOV.

LSIDURN:LSID:ZOOBANK.ORG:ACT:7E9F5477-EB17-4820-A783-74A7C8DFB65B

Holotype: A preserved specimen at the South Australian Museum, Adelaide, South Australia, Australia, specimen number R53777 collected from 9 km south west of Millicent, South Australia, Australia, Latitude -37.6333 S., Longitude 140.275 E. This government-owned facility allows access to its holdings.

Paratypes: Four preserved specimens at the South Australian Museum, Adelaide, South Australia, Australia, specimen numbers R49585, R49589, R49590 and R49594 all collected from 20 km west, north-west of Millicent Airport, South Australia, Australia, Latitude -37.5072 S., Longitude 140.1492 E.

Diagnosis: Until now, each of *Mcphieus hadynmcphiei sp. nov.*, *M. rawlinsoni* (Hutchinson and Donnellan, 1988) and *M. michaelmatheri sp. nov.* had all been treated as the single species originally described as "*Leiolopisma rawlinsoni* Hutchinson and Donnellan, 1988", but since placed in the genus *Pseudemoia* Fuhn, 1967 by Hutchinson *et al.* (1990), with a type species: *Lygosoma* (*Emoia*) *spenceri* Lucas and Frost, 1894) by all publishing authors since.

Exceptional to the preceding has been the placement of the putative species in *Claireascincus* Wells and Wellington, 1985, type species, *Lygosoma entrecasteauxii* Duméril and Bibron, 1839 by Wells and Wellington (1985) and by Dr. Allen E. Greer in an online database of Australian skinks published in year 2020 (available online at: https://docplayer.net/61329515-Encyclopedia-of-australian-reptiles-allen-e-greer-herpetology-section-australian-museum-introduction.html#show_full_text).

Mcphieus hadynmcphiei sp. nov. is restricted to Lake Hawdon, South Australia, Australia, Latitude 37.2249 S., Longitude 139.9469 E. in the west, along the coast and near coastal areas east to the western edge of the Otway Ranges in south-west Victoria as defined elsewhere in this paper.

M. rawlinsoni (Hutchinson and Donnellan, 1988), type locality near Bunyip, about 80 km south-east of Melbourne, Victoria, is confined to Victoria, east of Geelong on Port Phillip Bay to coastal eastern Victoria at Croajingolong National Park, with the species being most commonly found in the region between the Mornington Peninsula and Orbost, especially in coastal and near coastal areas.

Tasmanian specimens are also assigned to this species.

M. michaelmatheri sp. nov. occurs in the Snowy Mountains of New South Wales, immediately adjacent parts of north-east Victoria in the high country and the Brindabella Ranges on the border of the Australian Capital Territory and New South Wales.

Mcphieus hadynmcphiei sp. nov. is separated from the other two species *M. rawlinsoni* (Hutchinson and Donnellan, 1988) and *M. michaelmatheri sp. nov.* by the fact that the brownish-red upper lateral stripe is not bordered with black at the upper margin, versus is, for the other two species, or if so, only intermittently and not continuously as in the other two species (including as seen in the images of this taxon cited elsewhere in this description).

In *M. hadynmcphiei sp. nov.* the anterior of the upper surface of the head is a beige-brown colour, versus medium brown in *M. rawlinsoni* and a reddish brown colour in *M. michaelmatheri sp. nov.*.

M. hadynmcphiei sp. nov. has a beige iris versus dull orange in *M. rawlinsoni* and bright orange in *M. michaelmatheri sp. nov.*.

For both *M. hadynmcphiei sp. nov.* and *M. rawlinsoni* the anterior extension of the light stripe that separates the dorsum and lateral surface (on each side) extends to about the level of the ear opening, but in *M. michaelmatheri sp. nov.* it does not come close to this point, instead terminating significantly further back.

In both *M. hadynmcphiei sp. nov.* and *M. rawlinsoni* the upper labials are significantly lighter than the scales on the upper surface of the snout, versus usually not so in *M. michaelmatheri sp. nov.*.

M. michaelmatheri sp. nov. is most readily separated from the two other preceding species by the fact that the blackish striped scales on the body have a lighter etching on both anterior and posterior edges, versus not so in the other species. Exceptional to this is the vertebral line that does not have this etching on the scales.

M. michaelmatheri sp. nov. has an orange iris, versus beige in *M. hadynmcphiei sp. nov.* and light orange to brownish-grey in *M. rawlinsoni.*

The three preceding species are separated from *M. baudini* (Greer, 1982) and *M. scottgranti sp. nov.* by the absence of supranasal scales (versus presence in *M. baudini* and *M. scottgranti sp. nov.*).

In both *M. baudini* and *M. scottgranti sp. nov.* the nasal is separated posteriorly from the postnasal by a well developed suture, although this is often reduced to some extent in *M. scottgranti sp. nov.*. There is no such suture in any of *M. hadynmcphiei sp. nov.*, *M. rawlinsoni* or *M. michaelmatheri sp. nov.*.

M. baudini can be separated from *M. scottgranti sp. nov.* by its broadly meeting prefrontals and the position of the dorsolateral and lateral light stripes. In *M. scottgranti sp. nov.* the white line on the lower flank is two scales wide, versus 1-1.5 scales wide in *M. baudini.* The broad dark lateral stripe is distinct anteriorly as far as the rear of the eye in *M. baudini*, versus not so in *M. scottgranti sp. nov.*.

The five species within the genus *Mcphieus gen. nov.* are readily separated from all other species of Australian skink by the following unique suite of characters: small, active diurnal, smooth-scaled skinks characterised by: well developed pentadactyle limbs that meet or overlap when adpressed, or which fail to meet by no more than one or two scale-lengths; ear opening prominent with anterior lobules present; supranasals present or absent; parietal shields in contact behind the interparietal; distinct frontoparietals; movable lower eyelids with a transparent disc being almost as large as the eye; 23-30 mid-body rows; less than 30 lamellae under the fourth toe; a pale dorso-lateral stripe (usually, but not always distinct) on the third scale row of the midline of the back being a part of a distinctive pattern of light and dark stripes.

Species within the closely related genus *Pseudemoia* Fuhn, 1967 are similar in most respects to *Mcphieus gen. nov.*, but readily separated from that genus by the presence of 37-48 mid-body scale rows (vs 23-30 in *Mcphieus gen. nov.*) as well as always having supranasal scales present, no distinct frontoparietals and a flattened body.

Species within the closely related genus *Claireascincus* Wells and Wellington, 1985 are readily separated from both preceding genera by having 26-34 mid-body rows, no distinct frontoparietals and a pale dorso-lateral stripe on the fourth, or third and fourth scale row from the midline of the back.

Mcphieus hadynmcphiei sp. nov. in life is depicted online at:

https://www.flickr.com/photos/128497936@N03/50496288643/
and
https://www.flickr.com/photos/126237772@N07/51666108198/
and
https://www.inaturalist.org/observations/75632114
and
https://www.inaturalist.org/observations/100649956

M. rawlinsoni in life is depicted in Cogger (2014) on page 676 bottom left and in Wilson and Swan (2021) on page 423 at bottom left and online at:
https://www.flickr.com/photos/gondwanareptileproductions/40624621302/
and
https://www.flickr.com/photos/craigboase/14099135063/
and
https://www.flickr.com/photos/craigboase/13892496380/
and
https://www.inaturalist.org/observations/75012871
and
https://www.inaturalist.org/observations/100382894
and
https://www.inaturalist.org/observations/65632920

M. michaelmatheri sp. nov. in life is depicted in Swan, Shea and Sadlier (2004) on page 182 and online at:
https://www.inaturalist.org/observations/64069868
and
https://www.flickr.com/photos/23031163@N03/4391108667/

M. baudini in life is depicted in Wilson and Swan (2021) on page 421 at centre.

M. scottgranti sp. nov. in life is depicted in Cogger (2014) on page 674 at top left (as "*Pseudemoia baudini*") and online at:
https://www.flickr.com/photos/akashsherping/49442832931/
and
https://www.flickr.com/photos/128497936@N03/46770608345/
and
https://www.flickr.com/photos/128497936@N03/50287697698/

Distribution: *Mcphieus hadynmcphiei sp. nov.* is restricted to Lake Hawdon, South Australia, Australia, Latitude 37.2249 S., Longitude 139.9469 E in the west, along the coast and near coastal areas east to the western edge of the Otway Ranges in south-west Victoria as defined elsewhere in this paper.

Etymology: Both genus *Mcphieus gen. nov.* and the species and *Mcphieus hadynmcphiei sp. nov.,* are named in honour of Hadyn McPhie of Mirboo North in Gippsland, Victoria, Australia, in recognition of a lifetime's services to herpetology. Other species named in his honour have had different spellings in the epithet, but in this case the species name for *Mcphieus hadynmcphiei sp. nov.,* reflects the unusual, easily confused and correct spelling of his name. None of the previous names relevant to Hadyn McPhie as formally proposed by myself should have their spellings altered.

MCPHIEUS MICHAELMATHERI SP. NOV.

LSIDURN:LSID:ZOOBANK.ORG:ACT:03C0B54B-8A52-438A-B50A-6FA50C853D62

Holotype: A preserved specimen at the National Museum of Victoria, Melbourne, Victoria, Australia, specimen number D59874, collected from Ginini Flats on the border of the Australian Capital Territory and New South Wales, Australia at an elevation of about 1600 metres ASL, Latitude -35.52 S., Longitude 148.75 E. This government-owned facility allows access to its holdings.

Paratypes: Two preserved specimens held by the Australian National Wildlife Collection owned by the Commonwealth Scientific and Industrial Research Organisation, in Canberra, ACT, Australia.

These are specimen number R12029, collected from the summit of Mount Ginini in Namadgi National Park on the Australian Capital Territory and New South Wales, border in Australia, at about 1,760 metres above sea level, Latitude -35.52986 S., Longitude 148.77259 E; and specimen number R05126 collected from the summit of Mount Bimberi in the Brindabella Range, west of Canberra, ACT, Australia, approximate elevation 1,900 metres ASL, Latitude -35.6667 S., Longitude 148.7667 E.

Diagnosis: Until now, each of *M. michaelmatheri sp. nov.*, *Mcphieus hadynmcphiei sp. nov*. and *M. rawlinsoni* (Hutchinson and Donnellan, 1988) had all been treated as the single species originally described as "*Leiolopisma rawlinsoni* Hutchinson and Donnellan, 1988", but since placed in the genus *Pseudemoia* Fuhn, 1967 by Hutchinson *et al.* (1990), with a type species: *Lygosoma* (*Emoia*) *spenceri* Lucas and Frost, 1894) by all publishing authors since.

Exceptional to the preceding has been the placement of the putative species in *Claireascincus* Wells and Wellington, 1985, type species, *Lygosoma entrecasteauxii* Duméril and Bibron, 1839 by Wells and Wellington (1985) and more recently by Dr. Allen E. Greer in an online database of Australian skinks published in year 2020 (available online at: https://docplayer.net/61329515-Encyclopedia-of-australian-reptiles-allen-e-greer-herpetology-section-australian-museum-introduction.html#show_full_text).

Mcphieus rawlinsoni (Hutchinson and Donnellan, 1988), type locality near Bunyip, about 80 km south-east of Melbourne, Victoria, is confined to Victoria, east of Geelong on Port Phillip Bay to coastal eastern Victoria at Croajingolong National Park, with the species being most commonly found in the region between the Mornington Peninsula and Orbost, especially in coastal and near coastal areas.

Tasmanian specimens are also assigned to this species.

M. michaelmatheri sp. nov. occurs in the Snowy Mountains of New South Wales, immediately adjacent parts of north-east Victoria in the high country and the Brindabella Ranges on the border of the Australian Capital Territory and New South Wales.

M. hadynmcphiei sp. nov. is restricted to Lake Hawdon, South Australia, Australia, Latitude 37.2249 S., Longitude 139.9469 E. in the west, along the coast and near coastal areas east to the western edge of the Otway Ranges in south-west Victoria as defined elsewhere in this paper.

Mcphieus hadynmcphiei sp. nov. is separated from the other two species *M. rawlinsoni* (Hutchinson and Donnellan, 1988) and *M. michaelmatheri sp. nov.* by the fact that the brownish-red upper lateral stripe is not bordered with black at the upper margin, versus is, for the other two species, or if so, only intermittently and not continuously as in the other two species (as seen in the images of this taxon cited elsewhere in this description).

In *M. hadynmcphiei sp. nov*. the anterior of the upper surface of the head is a beige-brown colour, versus medium brown in *M. rawlinsoni* and a reddish brown colour in *M. michaelmatheri sp. nov.*.

M. hadynmcphiei sp. nov. has a beige iris versus dull orange in *M. rawlinsoni* and bright orange in *M. michaelmatheri sp. nov.*.

For both *M. hadynmcphiei sp. nov*. and *M. rawlinsoni* the anterior extension of the light stripe that separates the dorsum and lateral surface (on each side) extends to about the level of the ear opening, but in *M. michaelmatheri sp. nov.* it does not come close to this point, instead terminating significantly further back.

In both *M. hadynmcphiei sp. nov*. and *M. rawlinsoni* the upper labials are significantly lighter than the scales on the upper surface of the snout, versus usually not so in *M. michaelmatheri sp. nov.*.

M. michaelmatheri sp. nov. is most readily separated from the two other preceding species by the fact that the blackish striped scales on the body have a lighter etching on both anterior and posterior edges, versus not so in the other species. Exceptional to this is the vertebral line that does not have this etching on the scales.

M. michaelmatheri sp. nov. has an orange iris, versus beige in *M. hadynmcphiei sp. nov*. and light orange to brownish-grey in *M. rawlinsoni.*

The three preceding species are separated from *M. baudini* (Greer, 1982) and *M. scottgranti sp. nov*. by the absence of supranasal scales (versus presence in *M. baudini* and *M. scottgranti sp. nov*.).

In both *M. baudini* and *M. scottgranti sp. nov.* the nasal is separated posteriorly from the postnasal by a well developed suture, although this is often reduced to some extent in *M. scottgranti sp. nov.*. There is no such suture in any of *M. hadynmcphiei sp. nov*., *M. rawlinsoni* or *M. michaelmatheri sp. nov.*.

M. baudini can be separated from *M. scottgranti sp. nov.* by its broadly meeting prefrontals and the position of the dorsolateral and lateral light stripes. In *M. scottgranti sp. nov.* the white line on the lower flank is two scales wide, versus 1-1.5 scales wide in *M. baudini.* The broad dark lateral stripe is distinct anteriorly as far as the rear of the eye in *M. baudini*, versus not so in *M. scottgranti sp. nov.*.

The five species within the genus *Mcphieus gen. nov.* are readily separated from all other species of Australian skink by the following unique suite of characters: They are small, active diurnal, smooth-scaled skinks characterised by: well developed pentadactyle limbs that meet or overlap when adpressed, or which fail to meet by no more than one or two scale-lengths; ear opening prominent with anterior lobules present; supranasals present or absent; parietal shields in contact behind the interparietal; distinct frontoparietals; movable lower eyelids with a transparent disc being almost as large as the eye; 23-30 mid-body rows; less than 30 lamellae under the fourth toe; a pale dorso-lateral stripe (usually, but not always distinct) on the third scale row of the midline of the back being a part of a distinctive pattern of light and dark stripes.

Species within the closely related genus *Pseudemoia* Fuhn, 1967 are similar in most respects to *Mcphieus gen. nov*., but readily separated from that genus by the presence of 37-48 mid-body scale rows (vs 23-30 in *Mcphieus gen. nov*.) as well as always having supranasal scales present, no distinct frontoparietals and a flattened body.

Species within the closely related genus *Claireascincus* Wells and Wellington, 1985 are readily separated from both preceding genera by having 26-34 mid-body rows, no distinct frontoparietals and a pale dorso-lateral stripe on the fourth, or third and fourth scale row from the midline of the back.

Mcphieus hadynmcphiei sp. nov. in life is depicted online at:
https://www.flickr.com/photos/128497936@N03/50496288643/
and
https://www.flickr.com/photos/126237772@N07/51666108198/
and
https://www.inaturalist.org/observations/75632114
and
https://www.inaturalist.org/observations/100649956

M. rawlinsoni in life is depicted in Cogger (2014) on page 676 bottom left and in Wilson and Swan (2021) on page 423 at bottom left and online at:
https://www.flickr.com/photos/gondwanareptileproductions/40624621302/
and
https://www.flickr.com/photos/craigboase/14099135063/
and
https://www.flickr.com/photos/craigboase/13892496380/
and
https://www.inaturalist.org/observations/75012871
and
https://www.inaturalist.org/observations/100382894
and
https://www.inaturalist.org/observations/65632920

M. michaelmatheri sp. nov. in life is depicted in Swan, Shea and Sadlier (2004) on page 182 and online at:
https://www.inaturalist.org/observations/64069868
and
https://www.flickr.com/photos/23031163@N03/4391108667/

M. baudini in life is depicted in Wilson and Swan (2021) on page 421 at centre.

M. scottgranti sp. nov. in life is depicted in Cogger (2014) on page 674 at top left (as "*Pseudemoia baudini*") and online at:
https://www.flickr.com/photos/akashsherping/49442832931/
and
https://www.flickr.com/photos/128497936@N03/46770608345/
and
https://www.flickr.com/photos/128497936@N03/50287697698/

Distribution: *M. michaelmatheri sp. nov.* occurs in the Snowy Mountains of New South Wales, immediately adjacent parts of north-east Victoria in the high country and the Brindabella Ranges on the border of the Australian Capital Territory and New South Wales.

Etymology: Named in honour of Michael Mather of Wollongong in New South Wales, Australia in recognition of a lifetime's contributions to herpetology in Australia, particularly with respect to the captive study and breeding of skinks and pygopids (Pygopodidae) over many decades.

MCPHIEUS SCOTTGRANTI SP. NOV.

LSIDURN:LSID:ZOOBANK.ORG:ACT:B65FE56E-D4B8-499C-AD30-B6CD2EC221D5

Holotype: A preserved specimen at the South Australian Museum, Adelaide, South Australia, Australia, specimen number R5768, collected from Elliston, Eyre Peninsula, South Australia, Australia, Latitude -33.65 S., Longitude 134.88 E. This government-owned facility allows access to its holdings.

Paratypes: Three preserved specimens at the National Museum of Victoria, Melbourne, Victoria, Australia, specimen numbers D60963, D60964 and D60965 collected from Elliston, Eyre Peninsula, South Australia, Australia, Latitude -33.65 S., Longitude 134.88 E.

Diagnosis: Until now, the genus *Mcphieus gen. nov.*, as named and defined herein, consisted of two putative species, namely *M. rawlinsoni* (Hutchinson and Donnellan, 1988) and *M. baudini* (Greer, 1982).

Putative *M. rawlinsoni* is herein split three ways, while putative *M. baudini* is split two ways, with all three newly identified forms named as new species herein for the first time.

Until now, each of *M. michaelmatheri sp. nov.*, *Mcphieus hadynmcphiei sp. nov.* and *M. rawlinsoni* (Hutchinson and Donnellan, 1988) had all been treated as the single species originally described as "*Leiolopisma rawlinsoni* Hutchinson and Donnellan, 1988", but since placed in the genus *Pseudemoia* Fuhn, 1967 by Hutchinson *et al.* (1990), with a type species: *Lygosoma* (*Emoia*) *spenceri* Lucas and Frost, 1894) by all publishing authors since.

Exceptional to the preceding has been the placement of the putative species in *Claireascincus* Wells and Wellington, 1985, type species, *Lygosoma entrecasteauxii* Duméril and Bibron, 1839 by Wells and Wellington (1985) and more recently by Dr. Allen E. Greer in an online database of Australian skinks published in year 2020 (available online at: https://docplayer.net/61329515-Encyclopedia-of-australian-reptiles-allen-e-greer-herpetology-section-australian-museum-introduction.html#show_full_text).

Mcphieus rawlinsoni (Hutchinson and Donnellan, 1988), type locality near Bunyip, about 80 km south-east of Melbourne, Victoria, is confined to Victoria, east of Geelong on Port Phillip Bay to coastal eastern Victoria at Croajingolong National Park, with the species being most commonly found in the region between the Mornington Peninsula and Orbost, especially in coastal and near coastal areas. Tasmanian specimens are also

assigned to this species.

M. michaelmatheri sp. nov. occurs in the Snowy Mountains of New South Wales, immediately adjacent parts of north-east Victoria in the high country and the Brindabella Ranges on the border of the Australian Capital Territory and New South Wales.

M. hadynmcphiei sp. nov. is restricted to Lake Hawdon, South Australia, Australia, Latitude 37.2249 S., Longitude 139.9469 E. in the west, along the coast and near coastal areas east to the western edge of the Otway Ranges in south-west Victoria as defined elsewhere in this paper.

Mcphieus hadynmcphiei sp. nov. is separated from the other two species *M. rawlinsoni* (Hutchinson and Donnellan, 1988) and *M. michaelmatheri sp. nov.* by the fact that the brownish-red upper lateral stripe is not bordered with black at the upper margin, versus is, for the other two species, or if so, only intermittently and not continuously as in the other two species (as seen in the images of this taxon cited elsewhere in this description).

In *M. hadynmcphiei sp. nov*. the anterior of the upper surface of the head is a beige-brown colour, versus medium brown in *M. rawlinsoni* and a reddish brown colour in *M. michaelmatheri sp. nov.*.

M. hadynmcphiei sp. nov. has a beige iris versus dull orange in *M. rawlinsoni* and bright orange in *M. michaelmatheri sp. nov.*.

For both *M. hadynmcphiei sp. nov*. and *M. rawlinsoni* the anterior extension of the light stripe that separates the dorsum and lateral surface (on each side) extends to about the level of the ear opening, but in *M. michaelmatheri sp. nov.* it does not come close to this point, instead terminating significantly further back.

In both *M. hadynmcphiei sp. nov*. and *M. rawlinsoni* the upper labials are significantly lighter than the scales on the upper surface of the snout, versus usually not so in *M. michaelmatheri sp. nov.*.

M. michaelmatheri sp. nov. is most readily separated from the two other preceding species by the fact that the blackish striped scales on the body have a lighter etching on both anterior and posterior edges, versus not so in the other species. Exceptional to this is the vertebral line that does not have this etching on the scales.

M. michaelmatheri sp. nov. has an orange iris, versus beige in *M. hadynmcphiei sp. nov*. and light orange to brownish-grey in *M. rawlinsoni.*

The species *M. scottgranti sp. nov*. had been originally assigned to *Claireascincus entrecasteauxii* (Duméril and Bibron, 1839), by Greer (1982), when formally naming *M. baudini* (Greer, 1982), who separated the two species in his diagnosis of his new one.

More recently, *M. scottgranti sp. nov*. as defined herein was assigned to *M. baudini* (Greer, 1982), by authors such as Cogger (2014).

However it is self-evident that *M. scottgranti sp. nov*. is neither of the other two species.

As their closest living relatives and only known congeners within *Mcphieus gen. nov.*, *M. rawlinsoni*, *M. michaelmatheri sp. nov.* and *M. hadynmcphiei sp. nov.* are separated from *M. baudini* (Greer, 1982) and *M. scottgranti sp. nov*. by the absence of supranasal scales (versus presence in *M. baudini* and *M. scottgranti sp. nov*.).

In both *M. baudini* and *M. scottgranti sp. nov.* the nasal is separated posteriorly from the postnasal by a well developed suture, although this is often reduced to some extent in *M. scottgranti sp. nov.*. There is no such suture in any of *M. hadynmcphiei sp. nov*., *M. rawlinsoni* or *M. michaelmatheri sp. nov.*.

M. baudini can be separated from *M. scottgranti sp. nov.* by its broadly meeting prefrontals and the position of the dorsolateral and lateral light stripes. In *M. scottgranti sp. nov.* the white line on the lower flank is two scales wide, versus 1-1.5 scales wide in *M. baudini*. The broad dark lateral stripe is distinct anteriorly as far as the rear of the eye in *M. baudini*, versus not so in *M. scottgranti sp. nov.*.

The five species within the genus *Mcphieus gen. nov*. are readily separated from all other species of Australian skink by the following unique suite of characters: They are small, active diurnal, smooth-scaled skinks characterised by: well developed pentadactyle limbs that meet or overlap when adpressed, or which fail to meet by no more than one or two scale-lengths; ear opening prominent with anterior lobules present; supranasals present or absent; parietal shields in contact behind the interparietal; distinct frontoparietals; movable lower eyelids with a transparent disc being almost as large as the eye; 23-30 mid-body rows; less than 30 lamellae under the fourth toe; a pale dorso-lateral stripe (usually, but not always distinct) on the third scale row of the midline of the back being a part of a distinctive pattern of light and dark stripes.

Species within the closely related genus *Pseudemoia* Fuhn, 1967 are similar in most respects to *Mcphieus gen. nov*., but readily separated from that genus by the presence of 37-48 mid-body scale rows (vs 23-30 in *Mcphieus gen. nov*.) as well as always having supranasal scales present, no distinct frontoparietals and a flattened body.

Species within the closely related genus *Claireascincus* Wells and Wellington, 1985 are readily separated from both preceding genera by having 26-34 mid-body rows, no distinct frontoparietals and a pale dorso-lateral stripe on the fourth, or third and fourth scale row from the midline of the back.

Mcphieus hadynmcphiei sp. nov. in life is depicted online at:
https://www.flickr.com/photos/128497936@N03/50496288643/
and
https://www.flickr.com/photos/126237772@N07/51666108198/
and
https://www.inaturalist.org/observations/75632114
and
https://www.inaturalist.org/observations/100649956

M. rawlinsoni in life is depicted in Cogger (2014) on page 676 bottom left and in Wilson and Swan (2021) on page 423 at bottom left and online at:
https://www.flickr.com/photos/gondwanareptileproductions/40624621302/
and
https://www.flickr.com/photos/craigboase/14099135063/
and
https://www.flickr.com/photos/craigboase/13892496380/
and
https://www.inaturalist.org/observations/75012871
and
https://www.inaturalist.org/observations/100382894
and
https://www.inaturalist.org/observations/65632920

M. michaelmatheri sp. nov. in life is depicted in Swan, Shea and Sadlier (2004) on page 182 and online at:
https://www.inaturalist.org/observations/64069868
and
https://www.flickr.com/photos/23031163@N03/4391108667/

M. baudini in life is depicted in Wilson and Swan (2021) on page 421 at centre.

M. scottgranti sp. nov. in life is depicted in Cogger (2014) on page 674 at top left (as "*Pseudemoia baudini*") and online at:
https://www.flickr.com/photos/akashsherping/49442832931/
and
https://www.flickr.com/photos/128497936@N03/46770608345/
and
https://www.flickr.com/photos/128497936@N03/50287697698/

Distribution: *M. scottgranti sp. nov.* is apparently confined to the Eyre Peninsula of South Australia between St. Peter Island to the west and Port Lincoln in the east, generally near the coast, with type locality near the centre of the known distribution.

Etymology: The new species *M. scottgranti sp. nov.* is named in honour of Scott Grant of Whyalla, South Australia (as of 2021), in recognition of his services to wildlife conservation. He took over the lease on the Whyalla Fauna and Reptile Park, but was within three short years forced to shut down at gunpoint in late 2021. This is because his zoo was too successful and popular with the general public. This meant that his business posed a potential threat to the business success of the government-owned zoos in Adelaide, who prefer to operate in a monopolistic environment, where they are the only or main wildlife experience for the local population, and collect money from them to see the animals.

The announcement of his shut down was in the first instance on his Facebook page where he wrote:

"*Eyre Reptile & Wildlife Park*

November 10, 2021

It is with regret that the operators of the Eyre Reptile and Wildlife Park and Whyalla City Council can confirm that the park is closing as of Monday 15 November.

The park has provided access to a range of wildlife for both the community of Whyalla and visitors over a number of years, helping educate students and enable children to get up-close and interact with some of their favourite animals."

In turn the Murdoch Press via the Adelaide *Advertiser* newspaper did on 15 November, vilified Scott Grant and his business as part of their close relationship to the State Government and doing the bidding for the government's own dysfunctional zoo business.

There was no mention in their "news stories" of the important wildlife conservation work of Grant and his hard working family.

Successful wildlife conservation enterprises in South Australia are routinely shut down by the State Government, an earlier example being the successful Warrawong Sanctuary in the Adelaide Hills, owned by John Walmsley.

The Adelaide Zoo has had some very "successful" captive breeding programs for reptiles, including for the Pygmy Bluetongued Lizard *Lazarusus adelaidensis* (Peters, 1863), see Hoser (1991 and 2016b) for more on this species and the Western Ranges Taipan *Oxyuranus temporalis* Doughty *et al.* 2007.

The "success" of these programs being measured by them NOT breeding the species, because if they bred them and supplied specimens to other (rival) zoos, then they would lose their monopoly on possession of the species. This would damage their income flow in the form of visitors and cash hands outs from government and business to (supposedly) try to breed these species.

The government-granted monopoly that the Adelaide Zoo has on the Pygmy Bluetongued Lizard has been severely undermined in recent years by Queensland based reptile collector, private zoo owner and conservationist David Merceica, who was lucky to get some orphaned specimens from a wildlife rescue group in Tasmania and who has been breeding them in plague numbers ever since.

CLAIREASCINCUS JACKYHOSERAE SP. NOV.

LSIDURN:LSID:ZOOBANK.ORG:ACT:985E053A-5AA6-47AC-8DDE-85D249CB09D4

Holotype: A preserved adult female specimen in the South Australian Museum, Adelaide, South Australia, Australia, specimen number R39106 collected 5 km west of the New England Highway on Glenshiel Road, about 5 km north of Guyra Post Office, New South Wales, Australia, Latitude -30.13 S., Longitude 151.63 E. This government-owned facility allows access to its holdings.

Paratypes: Two preserved specimens in the South Australian Museum, Adelaide, South Australia, Australia, specimen numbers R39094 and R39096 collected 5 km west of the New England Highway on Glenshiel Road, about 5 km north of Guyra Post Office, NSW, Australia, Lat. -30.13 S., Long. 151.63 E.

Diagnosis: Until now, *Claireascincus jackyhoserae sp. nov.* has been treated as a north eastern population of *Claireascincus pagenstecheri* (Lindholm, 1901), *sensu* Haines *et al.* (2014), or alternatively the morphologically similar, *C. entrecasteauxii* (Duméril and Bibron, 1839), including the various forms described by Wells and Wellington in 1985, related to both *C. pagenstecheri* and *C. entrecasteauxii*.

However this species can be separated from all others in the genus *Claireascincus* Wells and Wellington, 1985 by the following unique suite of characters: No supranasals; a thick, blackish-grey vertebral stripe and two less distinct blackish-grey paravertebral stripes, as well as a distinctive white or cream dorso-lateral stripe, this being at least partially on the fourth scale row from the midline of the back; on each side of the head there is a bold white line running from the snout, under the eye below the ear to the anterior body; scales behind the eye are dark brown, etched anteriorly with light brown; breeding adults may have a semi-distinct orange flush on the mid flank that forms a semi-distinct stripe; iris is greyish-brown; dorsum is generally greyish-brown in adults. Other species in the genus *Claireascincus* do not have the complete suite of characters as just described, with one or more either absent, or different (e.g. a single vertebral stripe, without the associated paravertebral stripes, or brownish black dorsum).

Claireascincus jackyhoserae sp. nov., *C. pagenstecheri*, and putative *C. jenkinsi* Wells and Wellington, 1985, *C. schumacki* Wells and Wellington, 1985 (the latter two species sometimes treated as synonyms of *C. pagenstecheri*) are all separated from the other species in the genus by not having supranasal scales; the possession of two paravertebral stripes between the vertebral stripe and the dorsolateral stripe; a distinctive white or cream dorso-lateral stripe, this being at least partially on the fourth scale row from the midline of the back.

The species *Claireascincus triumvirates* Wells and Wellington, 1985 (depicted in Hoser (1989) on page 102 in bottom two images) is similar to *C. entrecasteauxii* (Duméril and Bibron, 1839), but is clearly of a different species. It is also more robust in build than *C. entrecasteauxii*, particularly with regard to the males.

Distribution: *Claireascincus jackyhoserae sp. nov.* is known only from the type locality, immediately north of Guyra in New South Wales, Australia. It is almost certainly a range restricted species and not likely to be found across a wide area.

Etymology: Named in honour of my youngest daughter, Jacky Indigo Hoser, DOB 19 May 2001, of Park Orchards, Victoria in recognition of more than 20 years of working with reptiles and various wildlife conservation outcomes.

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CONFLICT OF INTEREST

None.

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A revision of the taxonomy of the Australian skinks in the genus *Acritoscincus* Wells and Wellington, 1985 (AKA *Bassiana* Hutchinson *et al.* 1990), resulting in the formal division into three subgenera and the recognition and descriptions of new species.

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ABSTRACT

Skinks of the genus *Acritoscincus* Wells and Wellington, 1985 (AKA *Bassiana* Hutchinson *et al.* 1990), are mainly cool adapted species from southern Australia.

As of 2022, most publishing authors including Cogger (2014), representing the "popular" or "consensus" view of Australian reptile taxonomy, recognize just three species, being *A. trilineatus* Gray, 1838), the morphologically similar *A. duperreyi* (Gray, 1838) of south-east Australia and *A. platynotum* (Peters, 1831), readily separated from the other two species by the possession of a more horizontally flattened body.

Counter to this, Wells and Wellington (1985) recognized five species, two of which they formally named at the same time.

More recently, Dubey and Shine (2010) and Dissanayake *et al.* (2021), provided genetic evidence supporting the Wells and Wellington taxonomy and the presence yet more of unnamed forms.

This paper is the culmination of a detailed analysis of the genetic evidence, combined with inspection of specimens of each putative species from across their known ranges.

The result is a formal division of the genus into three subgenera, this decision being based on the time of divergence of each species complex; acceptance of all five taxa recognized by Wells and Wellington in 1985 and formal description of new species in each of the newly identified subgenera, generally conforming with the clades identified in the previous cited molecular studies, done in accordance with the rules of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999, as amended online since).

This makes a total of 13 recognized species.

Keywords: Taxonomy; nomenclature; Australia; Skink; *Acritoscincus*; *Bassiana*; *platynotus*; *trilineatus*; *buddeni*; *donellani*; New South Wales; South Australia; Victoria, Queensland, Tasmania; new subgenus; *Labialalbum*; *Celerscincus*; new species; *adelynhoserae*; *jackyhoserae*; *granti*; *taipanbarnetti*; *tybarnetti*; *davidmerceicai*; *katrinahoserae*; *paulwoolfi*; new subspecies; *diversus.*

INTRODUCTION

Skinks of the genus *Acritoscincus* Wells and Wellington, 1985 (AKA *Bassiana* Hutchinson *et al.* 1990), are a familiar and relatively abundant component of the skink lizard fauna of southern Australia.

They are found in a diversity of habitats, but appear to be mainly cool adapted species in as much as other species replace them in warmer regions.

The genus name *Acritoscincus* was first proposed and applied by Wells and Wellington in 1985.

At the time, the pair were accused of "Taxonomic Vandalism" by Glen Shea, Wolfgang Wüster and many others.

Very soon after and as it became self evident that the taxonomic proposals of Wells and Wellington in their major works of 1984 and 1985 generally had merit, a group of renegade herpetologists hatched a plan to have the Wells and Wellington names formally erased from the scientific record so that their cohort could overwrite the earlier names.

In effect they sought to steal "name authority" from Wells and Wellington and take credit for their hard work.

To execute their plan, a petition was lodged with the International Commission of Zoological Nomenclature (ICZN) in 1987, originally authored by the "President Australian Society of

Herpetologists" who at that time was Richard Shine (Shine 1987), best known for obtaining large grants from the Australian Research Council for projects of dubious merit, while at the same time, in effect depriving rivals of the same tax-payer funded monies.

The expectation in making the petition to the ICZN was that by making enough "noise" through false accusations against Wells and Wellington's ethics and their scientific methods, or alleged lack of them, that the ICZN would believe the lies and formally suppress the Wells and Wellington names from the scientific record.

Ultimately the petition failed in 1991, with the ICZN effectively voting unanimously in favour of Wells and Wellington (ICZN 1991).

Exceptional to this was Harold (Hal) Cogger, from Australia, who was new to the ICZN and alleged to have been put there to help effect the suppression of the Wells and Wellington works.

Following the vote in favour of Wells and Wellington, Cogger has reluctantly complied with the International Code of Zoological Nomenclature and used the Wells and Wellington names when he has deemed them taxonomy correct.

The significance of the Wells and Wellington case was not only that it was unprecedented in herpetology and the biological sciences generally, but because it involved hundreds of proposed names, making the scale of the action also important.

At the time Wells and Wellington (1985) was first published and the genus *Acritoscincus* defined by these authors, Cogger *et al.* (1993) only recognized two relevant species.

These were the Three Lined Skink *Tiliqua trilineata* Gray, 1838, of southern Australia with the described taxon *Tiliqua duperreyi* Gray, 1838 of south-eastern Australia being recognized as a synonym of the former, as well as the morphologically divergent form *Lygosoma* (*Mocoa*) *platynotum* Peters, 1881 of south-east Australia.

There were no other synonym names available for these putative species.

Counter to the views of Cogger *et al.* (1983), Wells and Wellington (1985) recognized five species, two of which they formally named at the same time.

They did of course resurrect from synonymy *Tiliqua duperreyi* Gray, 1838.

Notwithstanding the ruling of the ICZN in 1991, in favour of Wells and Wellington's works and a second ruling in their favour in 2001 (ICZN 2001) arising from Sprackland *et al.* (1997) and the ongoing availability of the Wells and Wellington names to the biological sciences, a group known as the Wolfgang Wüster gang of thieves have pressured publishing authors not to use or adopt the Wells and Wellington names (see Hoser 2007, 2009, 2012a, 2012b, 2013, 2015 a-f and sources cited therein).

This attack has been at numerous levels, ranging from control of editors of journals, lies, defamation and a number of anti-science tactics.

Central in all this has been a general proposition put by them that the taxonomy of Wells and Wellington is simply wrong and that therefore their names need not be used.

A clear example of this is seen in the online database they effectively control and censor, called "*The Reptile database*", now marketed as the "go to" reference for herpetological taxonomy and nomenclature.

Online at:
https://reptile-database.reptarium.cz

and optimized for Google (via so-called search engine optimisation), this website comes up for searches for most species of reptile globally when searched for by scientific name.

Once there, the internet user is fed the warped and twisted world view of reptile taxonomy as promulgated by Wolfgang Wüster and his gang of thieves.

In terms of the genus *Acritoscincus*, the name was over-written by Hutchinson *et al.* in 1990, with their own coined version *Bassiana*, both with the type species of *Tiliqua duperreyi* Gray, 1838.

Hutchinson *et al.* (1990) chose to over-write the Wells and Wellington name in anticipation of the ICZN ruling against Wells and Wellington and so they sought to "beat the rush" of other herpetologists stealing the work of Wells and Wellington to name the dozens of newly available to be named taxa.

Because the ICZN ruled in favour of Wells and Wellington in 1991, the name *Acritoscincus* has date priority over *Bassiana* and so it is the correct scientific name.

Because *Bassiana* has the same type species as *Acritoscincus* it is an objective synonym and is therefore simply an unavailable name for nomenclatural purposes in zoology.

Notwithstanding this, the name *Bassiana* has been improperly used by publishing authors in Australia for the relevant species in more recent times, including Cogger (2000) (who commenced using *Acritoscincus* in his books in Cogger 2014, as well as in a revised edition), Flatt *et al.* (2001), Dubey and Shine (2010) and Dissanayake *et al.* (2021).

Two of the last three cited papers all had Richard Shine, the main protagonist against Wells and Wellington listed as a co-author, while the most recent one Dissanayake *et al.* (2021), was co-authored by Arthur Georges, who has aggressively overwritten a number of Wells, or Wells and Wellington names in acts of attempted name authority theft, also in direct breach of the *International Code of Zoological Nomenclature*, making him a major protagonist against Wells and Wellington.

As of 2022, most publishing authors including Cogger (2014), represented the "popular" or "consensus" view of Australian reptile taxonomy, or at times, the Wüster gang view being foisted on all others.

That is not to say their view is correct.

In fact from it.

However this is what is put as "correct" in places and publications they control, including for example "The Reptile Database".

Science has however continued and it has become increasingly self-evident that each of the two species recognized by Cogger *et al.* (1983) are composite.

To that effect, the name *Tiliqua duperreyi* Gray, 1838 has been resurrected from synonymy for the eastern Australian species and appears as a valid species in for example Cogger (2014) and numerous other contemporary texts.

No publishing herpetologist that I am aware of, has however sought to recognize either of the taxa named by Wells and Wellington, in 1985 with *Acritoscincus buddeni* Wells and Wellington, 1985 being synonymised with *A. duperreyi* and *A. donnellani* Wells and Wellington, 1985 being synonymised with *A. platynotus* (Peters, 1881), these both being the earlier named taxa which are most closely related to the newly named forms.

This remains the case even after publication of Hoser (2007).

This continued non-recognition of either taxon as valid has occurred in the face of the molecular results of both Dubey and Shine (2010) and Dissanayake *et al.* (2021) which not only confirmed the validity of each, but also provided evidence of several other potentially unnamed species.

In the face of the preceding, and as part of an ongoing audit of the Australian herpetology, I had no choice but to revisit the earlier works just cited to determine which putative taxa were identifiable as valid species and needed to be recognized and/or formally named as appropriate.

MATERIALS AND METHODS

A review of the relevant literature encompassing the three putative species within *Acritoscincus* Wells and Wellington, 1985, as recently defined by Cogger (2014) was conducted.

This included the molecular studies of Dubey and Shine (2010) and Dissanayake *et al.* (2021), which flagged potentially

unidentified or unnamed species or subspecies.

Specimens of each putative species from across their known ranges were inspected, including both live and dead animals as well as photos of specimens with known provenance.

The regional populations conforming to putative species identified as potentially unnamed species by Dubey and Shine (2010) and Dissanayake *et al.* (2021) were inspected as were other unsampled populations, these usually being outlier populations, including some known to separated by previously determined biogeographical barriers.

The detailed work of Pengilley (1972), evidently relied upon by Wells and Wellington in 1985, was useful, even though Pengilley's ultimate conclusions were not matched here.

The lizards were inspected with a view to confirming if there were consistent identifiable differences between putative species enabling formal descriptions to be made as required.

The taxonomic history of the relevant lizards is summarized in Cogger *et al.* (1983) save for the changes of Wells and Wellington (1984, 1985), there being no changes in taxonomy or nomenclature since then, bar the work of Hutchinson *et el.* (1990), which for reasons already explained is now wholly irrelevant and simply a cluttering of the scientific literature in the form of unscientific taxonomic vandalism.

Literature relevant to the taxonomic conclusions herein, including other recent splits of putative species from south-east Australia include the following:

Cogger (2014) , Cogger *et al.* (2013), Greer (1982), Dissanayake *et al.* (2021), Dubey and Shine (2010), Duméril and Bibron (1839), Flatt *et al.* (2001), Gray (1838), Haines *et al.* (2014), Hoser (2016a, 2020 a-e), Hutchinson and Donnellan (1988, 1992), Hutchinson *et al.* (1990), Jenkins and Bartell (1980), Joyce (2003), Miner and Rosengren (2019), Pengilley (1972), Peters (1881), Rawlinson (1974), Schäuble *et al.* (2000), Smith (1937), Wells and Wellington (1984, 1985) and sources cited therein.

RESULTS

The taxonomy of the relevant putative species of lizards broadly conforms with that of Dubey and Shine (2010) and Dissanayake *et al.* (2021).

In terms of each of the relevant putative taxa, I was able to find consistently different characters between each of the different forms, enabling identification of each in the field or in the lab.

In terms of the three currently recognized putative species (as per Cogger 2014), namely *A. duperreyi*, *A. trilineatus* and *A. platynotus* all were identified as composite (or species groups), which is in line with the general findings of Dubey and Shine (2010) and Dissanayake *et al.* (2021).

The Wells and Wellington taxa, *A. buddeni* and *A. donnellani* are therefore formally resurrected from synonymy.

I note that this should have been the case arising from the publication of Dubey and Shine (2010) and not something I should be forced to do 12 years later!

Notwithstanding some findings of potential geologically recent gene flow across Bass Strait between *A. buddeni* and *A. duperreyi* by Dissanayake *et al.* (2021), I tentatively continue to recognize *A. buddeni* as a full species as opposed to downgrading the taxon to subspecies.

In summary:

Putative *A. duperreyi* is split seven ways, with five species formally named herein as new within this species group.

Dubey and Shine (2010) wrote of the five lineages herein formally named as new species:

"*Within* B. duperreyi*, the estimates dates of divergence between the major lineages began in the Upper Miocene and/or Upper Pliocene (3.9 Myr, 95% HPD: 3.6-5.9; 4.8, 95% HPD 4.2-6.6; 5.7 Myr, 95% HPD: 4.7-6.6; 3.3 Myr, 95% HPD: 2.6-3.7), depending on the calibration method*."

2.6-6.6 MYA is clearly species-level divergence.

A. trilineatus is split two ways, with one new species named herein.

This is a second distinctive species group.

In terms of the newly named species *A. davidmerceicai sp. nov.* Dubey and Shine (2010) wrote that the divergence:

"*within* B. trilineata *(was) from the Lower Pliocene to the Lower Pleistocene between the two main lineages (3.3 Myr, 95% HPD: 1.9–3.8; 3.7, 95% HPD 2.3–4.3; 3.0 Myr, 95% HPD: 2.5–4.3; 1.7 Myr, 95% HPD: 1.4–2.4), again depending on the calibration method*."

1.4-4.3 MYA is again clearly species-level divergence.

A. platynotus the third main species group is split four ways, with two new species named herein as well as a new subspecies.

In terms of putative *A. duperreyi* the taxa named generally reflect divisions of the western populations along the same lines as Dubey and Shine (2010) and Dissanayake *et al.* (2021).

I note here that in terms of *A. trilineatus*, I did not concur with Greer 1982, that there were two distinctive forms of *A. trilineatus* in south-western western Australia. Put another way, the local differences I observed between specimens was not of the species or subspecies level.

This position was also confirmed by Dubey and Shine (2010).

The eastern (South Australian) population is morphologically distinct, geographically separate and therefore formally named as a new species, which is also reflected by the genetic data of Dubey and Shine (2010).

For the *A. platynotus* species group, the split is not strictly in line with that of Dubey and Shine (2010).

The type specimen of *A. platynotus* (Peters, 1881), for which I have seen a published photograph clearly conforms to the coastal NSW form from around Sydney, New South Wales and so that is the type form of that species.

A. donnellani is of the lower New England Tableland population.

The Southern New South Wales population with a divergence of about 3 MYA is formally named *A. katrinahoserae sp. nov.*.

An isolated population from the Girraween National Park area in southern Queensland is formally named *A. paulwoolfi sp. nov.*.

The population from Morton National Park and Kanangra Walls in New South Wales is regarded as conspecific with the type form of *A. platynotus*, but is sufficiently divergent to warrant being treated as a subspecies (based on a divergence of about 1 MYA) and so is formally named herein as *A. platynotus diversus subsp. nov.*.

For the preceding newly named species Dubey and Shine (2010) wrote:

"*Within B.* platynotus*, the splits between the major lineages began in the Lower and Upper Pliocene (3.2 Myr, 95% HPD: 3.2–5.3; 4.3, 95% HPD 3.7–5.9; 4.4 Myr, 95% HPD: 4.1–5.9; 2.3 Myr, 95% HPD: 2.3–3.3)."*

2.2-5.9 MYA is clearly species-level divergence for the relevant taxa.

Dubey and Shine (2010) also gave divergences for each of the three main species groups in the vicinity of 10 MYA or longer, this being treated as genus-level division for many other vertebrates and reptiles.

These species groups diverged between 7.9 to 19.3 MYA depending on method of estimation, with most being well in excess of 10 MYA.

To that effect, each are placed in subgenera, two formally named for the first time.

All the preceding is done in accordance with the rules of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999, as amended online since).

While previously named taxa are not explicitly redefined in this paper, they are in effect redefined by virtue of the descriptions of the new forms, which in turn separate them from the previously named forms.

As part of the diagnosis for each genus, subgenus, species or subspecies, the species groups or similar are also separated from other relevant forms.

INFORMATION RELEVANT TO THE FORMAL DESCRIPTIONS THAT FOLLOW

There is no conflict of interest in terms of this paper or the conclusions arrived at herein.

Several people including anonymous peer reviewers who revised the manuscript prior to publication are also thanked as are relevant staff at museums who made specimens and records available in line with international obligations.

In terms of the following formal descriptions, spellings should not be altered in any way for any purpose unless expressly and exclusively called for by the rules governing Zoological Nomenclature as administered by the International Commission of Zoological Nomenclature (ICZN).

This includes if gender assignment of suffixes seems incorrect, Latinisation is wrong, apparent spelling mistakes and so on.

In the unlikely event two or more newly named taxa are deemed to be the same by a first reviser, then the name to be used and retained is that which first appears in this paper by way of page priority and as listed in the abstract keywords.

Some material in descriptions for taxa may be repeated for other taxa in this paper and this is necessary to ensure each fully complies with the provisions of the *International Code of Zoological Nomenclature* (fourth edition) (Ride *et al.* 1999) as amended online since.

Material downloaded from the internet and cited anywhere in this paper was downloaded and checked most recently as of 19 April 2022 (including if also viewed prior), unless otherwise stated and was accurate in terms of the content cited herein as of that date.

Any online citations within this paper, including copied emails and the like, are not as a rule cited in the references part of this paper and have the same most recent viewing date as just given.

Unless otherwise stated explicitly, colour and other descriptions apply to living adult specimens of generally good health, as seen by day, and not under any form of stress by means such as excessive cool, heat, dehydration, excessive ageing, abnormal skin or reaction to chemical or other input.

SVL or SV means snout-vent length, TL means tail length, preanal pores = precloacal pores, preanal = precloacal, tail measurements refer to original tails, max. size refers to maximum known, sometimes approximated up to the nearest 10 mm if number of measured specimens is below 10.

While numerous texts and references were consulted prior to publication of this paper, the criteria used to separate the relevant genera, subgenera, species or subspecies has already been spelt out and/or is done so within each formal description and does not rely on material within publications not explicitly cited herein.

CONSERVATION STATUS OF THE RELEVANT TAXA

Using accepted criteria, none of the relevant species are of immediate conservation concern. However on a larger time frame (hundreds of years), the comments in Hoser (1989, 1991, 1993 and 1996) apply, as do the comments in Hoser (2019a, 2019b).

GENUS *ACRITOSCINCUS* WELLS AND WELLINGTON, 1985

Type species: *Tiliqua duperreyi* Gray, 1838.

Diagnosis: Skinks in the genus *Acritoscincus sensu lato* are separated from all other Australasian skink lizards by the following unique suite of characters:

Slightly elongated body, somewhat horizontally flattened; pentadactyle limbs, limbs short, usually just touching when adpressed; parietal shields in contact behind the interparietal; 5-7 (usually 6-7) supraciliaries that are not noticeably enlarged; transparent palpebral disc in a movable lower eyelid; frontoparietals fused to form a single shield; interparietal reduced; supranasals absent; rostral-frontonasal suture is almost as wide as frontal; nasals usually narrowly separated and undivided; ear opening prominent and without lobules; breeding males have a red throat colouration; 60 mm snout-vent in adults with original tail about 150 percent of that.

Dorsal colouration is usually greyish or brownish on the upper surface, with or without flecks or other markings, with dark below that and light striping on the flanks of the body. Upper labials usually white or whitish.

Species in each of the newly identified subgenera are separated from one another as follows:

Both the nominate subgenus *Acritoscincus* and the subgenus *Labialalbum subgen. nov*. have some indication of one or more pale longitudinal stripes running down the back, these not being consistent with each scale row running down the back.

Other than perhaps dark or black spotting on each scale in each scale row running down the back in some specimens in the subgenus *Celerscincus subgen. nov.* there is no indication of pale striping running down the back.

Celerscincus subgen. nov. is further separated from the other two subgenera by having a body in adults that is noticeably horizontally flattened and wide, versus not so in the others.

Acritoscincus is readily separated from *Labialalbum subgen. nov*. by the presence of a pale mid lateral stripe with a prominent border, versus one that is ill-defined in *Labialalbum subgen. nov.*.

Dubey and Shine (2010) found that the three relevant subgenera diverged from one another somewhere between 7.9 and 19.3 MYA.

The content of the subgenus *Acritoscincus* is the seven species listed as follows: *Acritoscincus duperreyi* (Gray, 1838) (type species); *A. adelynhoserae sp. nov.*; *A buddeni* Wells and Wellington, 1985; *A. jackyhoserae sp. nov.*; *A. granti sp. nov.*; *A. taipanbarnetti sp. nov.*; *A. tybarnetti sp. nov.*.

Distribution: *Acritoscincus* occurs in the cooler parts of southern Australia, from upland parts of far south-east Queensland, through, New South Wales, Victoria, Tasmania and far southern South Australia, to south-western Australia.

Etymology: Taken from Wells and Wellington, 1985.

"*Etymology:* Acritoscincus*, from* Akritos - *mixed,* scincus - *skink, and alludes to the previous assemblage when this group was placed within the genus* Leiolopisma."

Content: *Acritoscincus duperreyi* (Gray, 1838) (type species); *A. adelynhoserae sp. nov.*; *A buddeni* Wells and Wellington, 1985; *A. davidmerceicai sp. nov.*; *A. donnellani* Wells and Wellington, 1985; *A. jackyhoserae sp. nov.*; *A. katrinahoserae sp. nov.*; *A. paulwoolfi sp. nov.*; *A. platynotus* (Peters, 1881); *A. granti sp. nov.*; *A. taipanbarnetti sp. nov.*; *A. trilineatus* (Gray, 1838); *A. tybarnetti sp. nov.*.

LABIALALBUM SUBGEN. NOV.

LSIDurn:lsid:zoobank.org:act:9540D7BA-3565-4A4C-8003-0855AB8AB60F

Type species: *Acritoscincus* (*Labialalbum*) *davidmerceicai sp. nov.*.

Diagnosis: Species in each of the newly identified subgenera including *Labialalbum subgen. nov*. are separated from one another as follows:

Both the nominate subgenus *Acritoscincus* and the subgenus *Labialalbum subgen. nov*. have some indication of one or more pale longitudinal stripes running down the back, these not being consistent with each scale row running down the back.

Other than perhaps dark or black spotting on each scale in each scale row running down the back in some specimens in the third subgenus *Celerscincus subgen. nov.* there is no indication of pale striping running down the back in that subgenus.

Celerscincus subgen. nov. is further separated from the other two subgenera by having a body in adults that is noticeably horizontally flattened and wide, versus not so in the others.

Acritoscincus is readily separated from *Labialalbum subgen. nov.* by the presence of a pale mid lateral stripe with a prominent border, versus one that is ill-defined in *Labialalbum subgen. nov.*.

Skinks in the genus *Acritoscincus sensu lato* are separated from all other Australasian skink lizards by the following unique suite of characters:

Slightly elongated body, somewhat horizontally flattened; pentadactyle limbs, limbs short, usually just touching when adpressed; parietal shields in contact behind the interparietal; 5-7 (usually 6-7) supraciliaries that are not noticeably enlarged; transparent palpebral disc in a movable lower eyelid; frontoparietals fused to form a single shield; interparietal reduced; supranasals absent; rostral-frontonasal suture is almost as wide as frontal; nasals usually narrowly separated and undivided; ear opening prominent and without lobules; breeding males have a red throat colouration; 60 mm snout-vent in adults with original tail about 150 percent of that.

Dorsal colouration is usually greyish or brownish on the upper surface, with or without flecks or other markings, with dark below that light striping on the flanks of the body. Upper labials usually white or whitish.

Dubey and Shine (2010) found that the three relevant subgenera diverged from one another somewhere between 7.9 and 19.3 MYA.

Distribution: South-western Western Australia, west of the Nullarbor and also in the far south of the Eyre Peninsula in South Australia.

Etymology: The new subgenus name *Labialalbum* derives from reference to the labial scales and the Latin word album or white, referring to the colour of these scales in the relevant species.

Content: *Acritoscincus* (*Labialalbum*) *davidmerceicai sp. nov.* (type species): *A.* (*Labialalbum*) *trilineatus* (Gray, 1838).

CELERSCINCUS SUBGEN. NOV.

LSIDurn:lsid:zoobank.org:act:A6AAFD5C-E074-481D-AD21-2BF7759AAACB

Type species: *Acritoscincus* (*Celerscincus*) *katrinahoserae sp. nov.*.

Diagnosis: Species in each of the newly identified subgenera including *Celerscincus subgen. nov.* are separated from one another as follows:

Both the nominate subgenus *Acritoscincus* and the subgenus *Labialalbum subgen. nov.* have some indication of one or more pale longitudinal stripes running down the back, these not being consistent with each scale row running down the back.

Other than perhaps dark or black spotting on each scale in each scale row running down the back in some specimens in the third subgenus *Celerscincus subgen. nov.* there is no indication of pale striping running down the back in that subgenus.

Celerscincus subgen. nov. is further separated from the other two subgenera by having a body in adults that is noticeably horizontally flattened and wide, versus not so in the others.

Acritoscincus is readily separated from *Labialalbum subgen. nov.* by the presence of a pale mid lateral stripe with a prominent border, versus one that is ill-defined in *Labialalbum subgen. nov.*.

Skinks in the genus *Acritoscincus sensu lato* are separated from all other Australasian skink lizards by the following unique suite of characters:

Slightly elongated body, somewhat horizontally flattened; pentadactyle limbs, limbs short, usually just touching when adpressed; parietal shields in contact behind the interparietal; 5-7 (usually 6-7) supraciliaries that are not noticeably enlarged; transparent palpebral disc in a movable lower eyelid; frontoparietals fused to form a single shield; interparietal reduced; supranasals absent; rostral-frontonasal suture is almost as wide as frontal; nasals usually narrowly separated and undivided; ear opening prominent and without lobules; breeding males have a red throat colouration; 60 mm snout-vent in adults with original tail about 150 percent of that.

Dorsal colouration is usually greyish or brownish on the upper surface, with or without flecks or other markings, with dark below that light striping on the flanks of the body. Upper labials usually white or whitish.

Dubey and Shine (2010) found that the three relevant subgenera diverged from one another somewhere between 7.9 and 19.3 MYA.

This subgenus as recognized herein includes four species, two of which are newly named, as well as a single newly named subspecies.

Distribution: Coast and ranges of New South Wales, Australia just entering Queensland in the far south-east in the Granite Belt and into far north-east Victoria on the coast and nearby ranges, generally in rocky areas.

Etymology: The new subgenus name *Celerscincus* derives from the Latin word "*celer*" meaning fast in reference to the fact that in terms of movement at high temperatures this is a very fast moving type of skink, especially as compared to other species of similar size inhabiting the same areas.

Content: *Acritoscincus* (*Celerscincus*) *katrinahoserae sp. nov.* (type species); *A.* (*Celerscincus*) *donnellani* Wells and Wellington, 1985; *A.* (*Celerscincus*) *paulwoolfi sp. nov.*; *A.* (*Celerscincus*) *platynotus* (Peters, 1881).

ACRITOSCINCUS* (*ACRITOSCINCUS*) *ADELYNHOSERAE SP. NOV.

LSIDurn:lsid:zoobank.org:act:DFC43E6C-7D7C-40ED-9043-29D97D5E420E

Holotype: A preserved specimen in the National Museum of Victoria, Melbourne, Victoria, Australia, specimen number D53755 collected from Granite Road, 5 km North, north-east of Anakie, Victoria, Australia, Latitude -37.87 S., Longitude 144.27 E.

This government-owned facility allows access to its holdings.

Paratypes: 1/ Three preserved specimens in the National Museum of Victoria, Melbourne, Victoria, Australia, specimen numbers D53426-8 all collected from 0.6 km North of the Yarringa Boat Ramp, North of Hastings, Victoria, Australia, Latitude -38.23 S., Longitude 145.23 E.

2/ Three preserved specimens in the Museum of Comparative Zoology, Harvard University in Cambridge, Massachusetts, USA, specimen numbers MCZ 61394-61396 collected from Dreeite, near Colac, Victoria, Australia, Latitude 38.1690 S., Longitude 143.5024 E.

Diagnosis: The species *Acritoscincus adelynhoserae sp. nov.* has until now been treated by most authors as a population of *Acritoscincus duperreyi* (Gray, 1838) *sensu lato* as per Dissanayake *et al.* (2021), noting that they regarded this as a potentially unnamed species.

Acritoscincus duperreyi (Gray, 1838) *sensu lato* as defined by Cogger (2014) and most other authors is herein treated as the following seven species, being:

Acritoscincus duperreyi (Gray, 1838) (type species), herein treated as being confined to Tasmania and the islands immediately offshore to the north.

A. adelynhoserae sp. nov. being found on the Mornington Peninsula south-east of Melbourne, including the shores of Western Port Bay, throughout the Melbourne metropolitan area, but mainly on the outskirts, or (nowadays rarely) larger reserves closer to the city, and west and south-west to about Colac, Victoria.

A buddeni Wells and Wellington, 1985 herein tentatively treated as a separate species to *A. duperreyi* being a species from the ACT and nearby parts of New South Wales and north-east Victoria.

A. jackyhoserae sp. nov. restricted to the Grampians in western Victoria.

A. granti sp. nov. from the hills east of Adelaide and cooler environs in South Australia.
A. taipanbarnetti sp. nov. from Kangaroo Island, South Australia.
A. tybarnetti sp. nov. from the south-east of South Australia.

With the exception of between the species *A. duperreyi* and *A. buddeni*, no evidence has been published suggesting recent gene flow between any of these taxa.

The five newly named species in this subgenus are readily separated from the other two previously named species (*A. duperreyi* and *A. buddeni*) by the following unique suite of characters:

A/ The vertebral stripe is a continuous (line) or occasionally somewhat broken (lines plus spots), except for *A. jackyhoserae sp. nov*. (see below), versus mostly obviously broken or as spots in *A. duperreyi* and *A. buddeni* (rarely continuous in a few specimens of *A. duperreyi*).

B/ Upper light line does not sit wholly over a row of scales (as it does in *A. duperreyi* and *A. buddeni*).

C/ Dark lateral band at midbody is normally on scale row 3, as opposed to 4 in *A. duperreyi* and *A. buddeni* as well as for *A.* (*Labialalbum*) *trilineatus* and *A.* (*Labialalbum*) *merceicai sp. nov.*.

D/ Lower light line is on scale rows 6 and 7, and bordered below by a dark line versus not so in *A. buddeni*, and only with black spotting in a linear form in *A. duperreyi*.

E/ 7 or 8 lower labials, usually 7; 5-7 lower labials, usually 5 or 6; 4-6 supraciliaries, usually 5;

7-10 upper ciliaries; 8-15 lower ciliaries; 39-51 fore toe subdigital lamellae; 53-72 hind toe subdigital lamellae; 25-31 midbody scale rows.

A buddeni is separated from *A. duperreyi* by having a light brown, versus dark copper brown dorsum and that the lower light line on the flank has no obvious border, versus one that has black spotting in a linear form in *A. duperreyi*.

The five newly named species *A. adelynhoserae sp. nov.*, *A. jackyhoserae sp. nov.*, *A. granti sp. nov.*, *A. taipanbarnetti sp. nov.* and *A. tybarnetti sp. nov.* are separated from one another by the following unique combinations of characters:

A. adelynhoserae sp. nov. has a mainly chocolate brown dorsum with a well-defined continuous thick, shiny black mid-dorsal stripe commencing from the back of the head and onto the anterior part of the tail, beyond which it breaks up and disintegrates; between the mid-dorsal stripe and the white lateral stripe at the top of the flanks is black spotting running down the back indicative of a dorso-lateral stripe; the white lateral stripe at the top of the flanks is also bounded at the top by a well defined shiny black line and below by the thick black lateral band, with a well defined white band below and below that a well-defined black lower border, with a mainly unmarked white venter. Upper labials are white and either unmarked or with only scattered flecks or scattered tiny spots only. Upper surfaces of the anterior limbs are heavily mottled black.

Many specimens have black spotting on the otherwise dark brown upper surface of the head.

Tail tapers reddish.

A. jackyhoserae sp. nov. is mainly brown on the dorsum with the mid-dorsal stripe barely visible or distinct, being thin (much less than a scale wide), broken in parts and not going beyond the pelvic region onto the tail. The tail is distinctly lighter and more greyish in colour. No obvious spotting or blotches are on the brown coloured upper surface of the head.

The upper boundary of the yellow or white lines on the top of the flanks is thin and barely discernible and greyish in colour, not black. The upper surfaces of the anterior limbs are mainly grey brown in colour with scattered dark spots or lines on the angles of the limbs.

A. granti sp. nov. has a strong greyish wash through the brown dorsum colouration. The mid-dorsal line is black in colour, but is quite evidently of irregular thickness as it runs down the body. The black boundary of the upper surface of the white band at the top of each flank has a jagged edge. The white band on the lower flank is peppered with grey. The brown coloured upper surface of the head may or may not have scattered tiny spots of flecks. Many specimens have scattered black spotting running in lines down either side of the back between the mid dorsal stripe and the top of the flanks.

Tail tapers greyish.

A. taipanbarnetti sp. nov. is similar in appearance in most respects to *A. granti sp. nov.* (see above), but is separated from that species by the presence of grey peppering on the very white upper labials and a greyish-brown as opposed to brown upper surface of the head. The head of this species is obviously marked with darker brownish-black patches within some or most dorsal scales.

Peppering forms a greyish stripe on either side of the upper surface of the anterior tail.

A. taipanbarnetti sp. nov. is further separated from the other four species by extensive cream coloured areas on the sides of the neck and fore-flanks which in turn have scattered brown or grey peppering.

*A. tybarnetti sp. nov.*is readily separated from all the preceding species by a dorsum that to a large extent merges the intensity of the contrasting colours on the dorsum and flanks. The mid dorsal stripe is thick and even along its length, but dark grey as opposed to black. The black lateral stripe is also reduced in intensity, to be dark grey, but the intensity is not reduced as much as the mid-dorsal stripe. The white line along the upper surface of the flank is jagged edged above and below and in turn bounded above by a thick greyish-black line which is not at all jagged edged at the mid body side and 2-3 times as thick as the white line it borders.

The white line on the lower flanks is reduced in width to be less than one scale wide and bound at the bottom by a series of well-defined black triangles on a white background, these triangles being wider than the line itself above. The upper surface of that line is also jagged edged and therefore appears to be somewhat indistinct.

The light brown head is heavily spotted with grey or brown; the upper anterior labials are spotted grey or brown. Forelimbs are light grey with dark flecks or spots.

White surfaces on the sides of the back of the head and neck are heavily peppered with grey spots or flecks. Tail becomes mainly grey.

Species in each of the newly identified subgenera are separated from one another as follows:

Both the nominate subgenus *Acritoscincus* (including the seven species accounted for above) and the subgenus *Labialalbum subgen. nov.* have some indication of one or more pale longitudinal stripes running down the back, these not being consistent with each scale row running down the back.

Other than perhaps dark or black spotting on each scale in each scale row running down the back in some specimens in the subgenus *Celerscincus subgen. nov.* there is no indication of pale striping running down the back.

Celerscincus subgen. nov. is further separated from the other two subgenera by having a body in adults that is noticeably horizontally flattened and wide, versus not so in the others.

Acritoscincus is readily separated from *Labialalbum subgen. nov.* by the presence of a pale mid lateral stripe with a prominent upper border, versus one that is ill-defined in *Labialalbum subgen. nov.*.

Dubey and Shine (2010) found that the three relevant subgenera diverged from one another somewhere between 7.9 and 19.3 MYA, making genus-level recognition for each species group appropriate.

Colour images of *A. adelynhoserae sp. nov.* in life can be found online at:

https://www.inaturalist.org/observations/108930882

and
https://www.inaturalist.org/observations/61070498
and
https://www.inaturalist.org/observations/72589131
and
https://www.inaturalist.org/observations/35083376
and
https://www.inaturalist.org/observations/76346912
A colour image of *A. adelynjackyhoserae sp. nov.* in life can be found online at:
https://www.inaturalist.org/observations/85406397
Colour images of *A. granti sp. nov.* in life can be found online at:
https://www.inaturalist.org/observations/75138008
and
https://www.inaturalist.org/observations/57632755
and
https://www.inaturalist.org/observations/88775040
Colour images of *A. tybarnetti* in life can be found online at:
https://www.inaturalist.org/observations/96410777
and
https://www.inaturalist.org/observations/105075526
Colour images of *A. duperreyi* in life can be found online at:
https://www.inaturalist.org/observations/101430422
and
https://www.inaturalist.org/observations/35913907
and
https://www.inaturalist.org/observations/36463417
and
https://www.inaturalist.org/observations/87192890
Colour images of *A. buddeni* in life can be found in Hoser (1989) at page 103, in second image down from top and online at:
https://www.inaturalist.org/observations/34894404
Dubey and Shine (2010) wrote of the five lineages herein formally named as new species:
"*Within* B. duperreyi*, the estimates dates of divergence between the major lineages began in the Upper Miocene and/or Upper Pliocene (3.9 Myr, 95% HPD: 3.6-5.9; 4.8, 95% HPD 4.2-6.6; 5.7 Myr, 95% HPD: 4.7-6.6; 3.3 Myr, 95% HPD: 2.6-3.7), depending on the calibration method*."
2.6-6.6 MYA is clearly species-level divergence.
Skinks in the genus *Acritoscincus sensu lato* are separated from all other Australasian skink lizards by the following unique suite of characters:
Slightly elongated body, somewhat horizontally flattened; pentadactyle limbs, limbs short, usually just touching when adpressed; parietal shields in contact behind the interparietal; 5-7 (usually 6-7) supraciliaries that are not noticeably enlarged; transparent palpebral disc in a movable lower eyelid; frontoparietals fused to form a single shield; interparietal reduced; supranasals absent; rostral-frontonasal suture is almost as wide as frontal; nasals usually narrowly separated and undivided; ear opening prominent and without lobules; breeding males have a red throat colouration; 60 mm snout-vent in adults with original tail about 150 percent of that.
Dorsal colouration is usually greyish or brownish on the upper surface, with or without flecks or other markings, with dark below that light striping on the flanks of the body. Upper labials usually white or whitish.
Distribution: *A. adelynhoserae sp. nov.* occurs on the Mornington Peninsula south-east of Melbourne, including the shores of Western Port Bay, throughout the Melbourne metropolitan area, but mainly on the outskirts, or (nowadays rarely) larger reserves closer to the city, and west and south-west to about Colac, Victoria.
Etymology: *A. adelynhoserae sp. nov.* is named in honour of my eldest daughter, Adelyn Kimberley Hoser, born in 1999 in recognition of more than two decades of thankless work with wildlife conservation and education, including with Snakebusters: Australia's best reptiles shows, being the only reptile shows in Australia that are hands on and let people hold the animals.
In July 2011, Adelyn Hoser, then aged 12 proudly volunteered to take bites from surgically devenomized snakes at a public wildlife display at the Melton Shopping Mall (Victoria), to shatter a lie being peddled by Helen McCracken, a head veterinary surgeon at Melbourne Zoo at Zoos Victoria, that surgically devenomized snakes owned by Snakebusters had regenerated venom.
In a later court case relating to the McCracken lies and the bites by the devenomized snakes, including an Inland Taipan and Death Adder, three Supreme Court judges found in 2014 that her actions were appropriate bearing in mind the damage the lies of McCracken were causing to the Hoser wildlife display business and wildlife conservation and education generally. A year later, in 2015, VCAT Judge Gerard Butcher, also found against the lies of McCracken, leading him to state they had made Adelyn Hoser's volunteering to take bites to shatter the lies as wholly justified and the best way to prove as fact that the devenomized snakes had not and could not ever regenerate venom.

ACRITOSCINCUS* (*ACRITOSCINCUS*) *JACKYHOSERAE SP. NOV.

LSIDurn:lsid:zoobank.org:act:674495C5-D674-468C-B0A3-77C0886F2D78

Holotype: A preserved adult female specimen at the National Museum of Victoria, Melbourne, Victoria, Australia, specimen number D34914 collected from the Mount Rosea Track, Tower Hill, Grampians, Victoria, Australia, Latitude -37.2 S., Longitude 142.47 E. This government-owned facility allows access to its holdings.
Paratypes: Two preserved specimens at the National Museum of Victoria, Melbourne, Victoria, Australia, specimen numbers D39513 and D39514 collected from 6.4 km west of Mount Rosea at the Black Range camping area, Grampians, Victoria, Australia, Latitude -37.2 S., Longitude 142.42 E.
Diagnosis: The species *Acritoscincus jackyhoserae sp. nov.* has until now been treated by most authors as a population of *Acritoscincus duperreyi* (Gray, 1838) *sensu lato* as per Dubey and Shine (2010) and/or Dissanayake *et al.* (2021), noting that they regarded this as a potentially unnamed species.
Acritoscincus duperreyi (Gray, 1838) *sensu lato* as defined by Cogger (2014) and most other authors is herein treated as the following seven species, being:
Acritoscincus duperreyi (Gray, 1838) (type species), herein treated as being confined to Tasmania and the islands immediately offshore to the north.
A. adelynhoserae sp. nov. being found on the Mornington Peninsula south-east of Melbourne, including the shores of Western Port Bay, throughout the Melbourne metropolitan area, but mainly on the outskirts, or (nowadays rarely) larger reserves closer to the city, and west and south-west to about Colac, Victoria.
A buddeni Wells and Wellington, 1985 herein tentatively treated as a separate species to *A. duperreyi* being a species from the ACT and nearby parts of New South Wales and north-east Victoria.
A. jackyhoserae sp. nov. restricted to the Grampians in western Victoria.
A. granti sp. nov. from the hills east of Adelaide and cooler environs in South Australia.
A. taipanbarnetti sp. nov. from Kangaroo Island, South Australia.
A. tybarnetti sp. nov. from the south-east of South Australia.
With the exception of between the species *A. duperreyi* and *A. buddeni*, no evidence has been published suggesting recent gene flow between any of these taxa.

The five newly named species in this subgenus are readily separated from the other two previously named species (*A. duperreyi* and *A. buddeni*) by the following unique suite of characters:

A/ The vertebral stripe is a continuous (line) or occasionally somewhat broken (lines plus spots), except for *A. jackyhoserae sp. nov.* (see below), versus mostly obviously broken or as spots in *A. duperreyi* and *A. buddeni* (rarely continuous in a few specimens of *A. duperreyi*).

B/ Upper light line does not sit wholly over a row of scales (as it does in *A. duperreyi* and *A. buddeni*).

C/ Dark lateral band at midbody is normally on scale row 3, as opposed to 4 in *A. duperreyi* and *A. buddeni* as well as for *A.* (*Labialalbum*) *trilineatus* and *A.* (*Labialalbum*) *merceicai sp. nov.*.

D/ Lower light line is on scale rows 6 and 7, and bordered below by a dark line versus not so in *A. buddeni*, and only with black spotting in a linear form in *A. duperreyi*.

E/ 7 or 8 lower labials, usually 7; 5-7 lower labials, usually 5 or 6; 4-6 supraciliaries, usually 5;

7-10 upper ciliaries; 8-15 lower ciliaries; 39-51 fore toe subdigital lamellae; 53-72 hind toe subdigital lamellae; 25-31 midbody scale rows.

A buddeni is separated from *A. duperreyi* by having a light brown, versus dark copper brown dorsum and that the lower light line on the flank has no obvious border, versus one that has black spotting in a linear form in *A. duperreyi*.

The five newly named species *A. adelynhoserae sp. nov.*, *A. jackyhoserae sp. nov.*, *A. granti sp. nov.*, *A. taipanbarnetti sp. nov.* and *A. tybarnetti sp. nov.* are separated from one another by the following unique combinations of characters:

A. adelynhoserae sp. nov. has a mainly chocolate brown dorsum with a well-defined continuous thick, shiny black mid-dorsal stripe commencing from the back of the head and onto the anterior part of the tail, beyond which it breaks up and disintegrates; between the mid-dorsal stripe and the white lateral stripe at the top of the flanks is black spotting running down the back indicative of a dorso-lateral stripe; the white lateral stripe at the top of the flanks is also bounded at the top by a well defined shiny black line and below by the thick black lateral band, with a well defined white band below and below that a well-defined black lower border, with a mainly unmarked white venter. Upper labials are white and either unmarked or with only scattered flecks or scattered tiny spots only. Upper surfaces of the anterior limbs are heavily mottled black.

Many specimens have black spotting on the otherwise dark brown upper surface of the head.

Tail tapers reddish.

A. jackyhoserae sp. nov. is mainly brown on the dorsum with the mid-dorsal stripe barely visible or distinct, being thin (much less than a scale wide), broken in parts and not going beyond the pelvic region onto the tail. The tail is distinctly lighter and more greyish in colour. No obvious spotting or blotches are on the brown coloured upper surface of the head.

The upper boundary of the yellow or white lines on the top of the flanks is thin and barely discernible and greyish in colour, not black. The upper surfaces of the anterior limbs are mainly grey brown in colour with scattered dark spots or lines on the angles of the limbs.

A. granti sp. nov. has a strong greyish wash through the brown dorsum colouration. The mid-dorsal line is black in colour, but is quite evidently of irregular thickness as it runs down the body. The black boundary of the upper surface of the white band at the top of each flank has a jagged edge. The white band on the lower flank is peppered with grey. The brown coloured upper surface of the head may or may not have scattered tiny spots of flecks. Many specimens have scattered black spotting running in lines down either side of the back between the mid dorsal stripe and the top of the flanks.

Tail tapers greyish.

A. taipanbarnetti sp. nov. is similar in appearance in most respects to *A. granti sp. nov.* (see above), but is separated from that species by the presence of grey peppering on the very white upper labials and a greyish-brown as opposed to brown upper surface of the head. The head of this species is obviously marked with darker brownish-black patches within some or most dorsal scales.

Peppering forms a greyish stripe on either side of the upper surface of the anterior tail.

A. taipanbarnetti sp. nov. is further separated from the other four species by extensive cream coloured areas on the sides of the neck and fore-flanks which in turn have scattered brown or grey peppering.

*A. tybarnetti sp. nov.*is readily separated from all the preceding species by a dorsum that to a large extent merges the intensity of the contrasting colours on the dorsum and flanks. The mid dorsal stripe is thick and even along its length, but dark grey as opposed to black. The black lateral stripe is also reduced in intensity, to be dark grey, but the intensity is not reduced as much as the mid-dorsal stripe. The white line along the upper surface of the flank is jagged edged above and below and in turn bounded above by a thick greyish-black line which is not at all jagged edged at the mid body side and 2-3 times as thick as the white line it borders.

The white line on the lower flanks is reduced in width to be less than one scale wide and bound at the bottom by a series of well-defined black triangles on a white background, these triangles being wider than the line itself above. The upper surface of that line is also jagged edged and therefore appears to be somewhat indistinct.

The light brown head is heavily spotted with grey or brown; the upper anterior labials are spotted grey or brown. Forelimbs are light grey with dark flecks or spots.

White surfaces on the sides of the back of the head and neck are heavily peppered with grey spots or flecks. Tail becomes mainly grey.

Species in each of the newly identified subgenera are separated from one another as follows:

Both the nominate subgenus *Acritoscincus* (including the seven species accounted for above) and the subgenus *Labialalbum subgen. nov.* have some indication of one or more pale longitudinal stripes running down the back, these not being consistent with each scale row running down the back.

Other than perhaps dark or black spotting on each scale in each scale row running down the back in some specimens in the subgenus *Celerscincus subgen. nov.* there is no indication of pale striping running down the back.

Celerscincus subgen. nov. is further separated from the other two subgenera by having a body in adults that is noticeably horizontally flattened and wide, versus not so in the others.

Acritoscincus is readily separated from *Labialalbum subgen. nov.* by the presence of a pale mid lateral stripe with a prominent upper border, versus one that is ill-defined in *Labialalbum subgen. nov.*.

Dubey and Shine (2010) found that the three relevant subgenera diverged from one another somewhere between 7.9 and 19.3 MYA, making genus-level recognition for each species group appropriate.

Colour images of *A. adelynhoserae sp. nov.* in life can be found online at:

https://www.inaturalist.org/observations/108930882

and

https://www.inaturalist.org/observations/61070498

and

https://www.inaturalist.org/observations/72589131

and

https://www.inaturalist.org/observations/35083376

and

https://www.inaturalist.org/observations/76346912

A colour image of *A. adelynjackyhoserae sp. nov.* in life can be found online at:

https://www.inaturalist.org/observations/85406397

Colour images of *A. granti sp. nov.* in life can be found online at:

https://www.inaturalist.org/observations/75138008

and

https://www.inaturalist.org/observations/57632755

and

https://www.inaturalist.org/observations/88775040

Colour images of *A. tybarnetti* in life can be found online at:

https://www.inaturalist.org/observations/96410777

and

https://www.inaturalist.org/observations/105075526

Colour images of *A. duperreyi* in life can be found online at:

https://www.inaturalist.org/observations/101430422

and

https://www.inaturalist.org/observations/35913907

and

https://www.inaturalist.org/observations/36463417

and

https://www.inaturalist.org/observations/87192890

Colour images of *A. buddeni* in life can be found in Hoser (1989) at page 103, in second image down from top and online at:

https://www.inaturalist.org/observations/34894404

Dubey and Shine (2010) wrote of the five lineages herein formally named as new species:

"*Within* B. duperreyi*, the estimates dates of divergence between the major lineages began in the Upper Miocene and/or Upper Pliocene (3.9 Myr, 95% HPD: 3.6-5.9; 4.8, 95% HPD 4.2-6.6; 5.7 Myr, 95% HPD: 4.7-6.6; 3.3 Myr, 95% HPD: 2.6-3.7), depending on the calibration method*."

2.6-6.6 MYA is clearly species-level divergence.

Skinks in the genus *Acritoscincus sensu lato* are separated from all other Australasian skink lizards by the following unique suite of characters:

Slightly elongated body, somewhat horizontally flattened; pentadactyle limbs, limbs short, usually just touching when adpressed; parietal shields in contact behind the interparietal; 5-7 (usually 6-7) supraciliaries that are not noticeably enlarged; transparent palpebral disc in a movable lower eyelid; frontoparietals fused to form a single shield; interparietal reduced; supranasals absent; rostral-frontonasal suture is almost as wide as frontal; nasals usually narrowly separated and undivided; ear opening prominent and without lobules; breeding males have a red throat colouration; 60 mm snout-vent in adults with original tail about 150 percent of that.

Dorsal colouration is usually greyish or brownish on the upper surface, with or without flecks or other markings, with dark below that light striping on the flanks of the body. Upper labials usually white or whitish.

Distribution: *A. jackyhoserae sp. nov.* appears to be restricted to the Grampians in western Victoria, Australia.

Etymology: *A. jackyhoserae sp. nov.* is named in honour of my youngest daughter, Jacky Indigo Hoser, born in 2001 in recognition of more than two decades of thankless work with wildlife conservation and education, including with Snakebusters: Australia's best reptiles shows, being the only reptile shows in Australia that are hands on and let people hold the animals.

On 10 August 2011 at age 10, Jacky Hoser was violently arrested by police while in her classroom at school and then viciously assaulted, after it was reported in the tabloid media that she had volunteered to take bites from devenomized snakes to prove they were safe.

The arrest and assault were wholly illegal and occurred as a result of a campaign by Zoos Victoria to attack the Hoser wildlife education business, they saw as a potential threat to the Zoos Victoria monopoly on the "wildlife business" in Victoria.

She was arrested illegally again 6 days later in her own home in an unlawful nine hour armed raid.

Jacky Hoser, had volunteered to take bites from devenomized snakes in front of a shopping mall audience a month later, but had not done so on the day in question. It was her older sister Adelyn, that did so and was filmed in front of a massive crowd at the Melton Shopping Mall doing so.

It was Jacky who was arrested and assaulted because the police believed the tabloid media reports that erroneously said she was the person who had been bitten by the snakes.

Both Jacky and Adelyn had seen myself (Raymond Hoser), bitten by devenomized snakes (mainly Inland Taipan and Tiger Snakes) countless times over the previous decade and had asked what it felt like, to which they were told, "bugger all", leading them both to ask to be bitten, so they knew exactly what it felt like.

It is also important that a person handling venomous snakes that are devenomized be aware of what an innocuous bite is like, so that they do not over-react if and when a snake moves their head towards them, noting that bites are relatively uncommon anyway.

Devenomized snakes can of course be handled exactly the same was any other effectively harmless non-venomous snake.

This is an essential part of the training of a snake handler in a wildlife display business working with devenomized snakes. This is particularly so, noting that both daughters had worked in the wildlife education business literally from birth.

It goes without saying that in the Hoser business, devenomizing snakes surgically involved complete removal of venom glands, and confirmation of the non-venomous state several times and in several ways, before the snakes were used in venomous snake shows and displays.

In other words, there had never been any serious possibility of venom regeneration in devenomized snakes and lie was invented purely for the commercial benefit of Zoos Victoria and other business rivals, none of whom had any interest in wildlife conservation, but instead only their own financial self-gratification.

ACRITOSCINCUS* (*ACRITOSCINCUS*) *GRANTI SP. NOV.

LSIDurn:lsid:zoobank.org:act:8729ACEA-1263-4AE1-A1BB-94A1C0A195B2

Holotype: A preserved specimen at the South Australian Museum, Adelaide, South Australia, Australia, specimen number SAM R10641 collected from Spring Mountain, South Australia, Australia, Latitude -35.43 S., Longitude 138.53 E. This government-owned facility allows access to its holdings.

Paratypes: Five preserved specimens at the South Australian Museum, Adelaide, South Australia, Australia, specimen numbers R53557 and R53559 both collected from 4.6 km north-west of Inman Valley, South Australia, Australia, Latitude -35.4569 S., Longitude 138.4381 E.; specimen number R71215 collected from 1.9 km west north-west of Spring Mountain, South Australia, Australia, Latitude -35.4292 S., Longitude 138.5128 S.; and specimen numbers R53584 and R53587 both collected from 1.6 km west of Spring Mountain, South Australia, Australia, Latitude -35.4397 S., Longitude 138.5239 E.

Diagnosis: The species *Acritoscincus granti sp. nov.* has until now been treated by most authors as a population of *Acritoscincus duperreyi* (Gray, 1838) *sensu lato* as per Dubey and Shine (2010) and/or Dissanayake *et al.* (2021), noting that they regarded this as a potentially unnamed species.

Acritoscincus duperreyi (Gray, 1838) *sensu lato* as defined by Cogger (2014) and most other authors is herein treated as the following seven species, being:

Acritoscincus duperreyi (Gray, 1838) (type species), herein treated as being confined to Tasmania and the islands

immediately offshore to the north.

A. adelynhoserae sp. nov. being found on the Mornington Peninsula south-east of Melbourne, including the shores of Western Port Bay, throughout the Melbourne metropolitan area, but mainly on the outskirts, or (nowadays rarely) larger reserves closer to the city, and west and south-west to about Colac, Victoria.

A buddeni Wells and Wellington, 1985 herein tentatively treated as a separate species to *A. duperreyi* being a species from the ACT and nearby parts of New South Wales and north-east Victoria.

A. jackyhoserae sp. nov. restricted to the Grampians in western Victoria.

A. granti sp. nov. from the hills east of Adelaide and cooler environs in South Australia.

A. taipanbarnetti sp. nov. from Kangaroo Island, South Australia.

A. tybarnetti sp. nov. from the south-east of South Australia.

With the exception of between the species *A. duperreyi* and *A. buddeni*, no evidence has been published suggesting recent gene flow between any of these taxa.

The five newly named species in this subgenus are readily separated from the other two previously named species (*A. duperreyi* and *A. buddeni*) by the following unique suite of characters:

A/ The vertebral stripe is a continuous (line) or occasionally somewhat broken (lines plus spots), except for *A. jackyhoserae sp. nov*. (see below), versus mostly obviously broken or as spots in *A. duperreyi* and *A. buddeni*, (rarely continuous in a few specimens of *A. duperreyi*).

B/ Upper light line does not sit wholly over a row of scales (as it does in *A. duperreyi* and *A. buddeni*).

C/ Dark lateral band at midbody is normally on scale row 3, as opposed to 4 in *A. duperreyi* and *A. buddeni* as well as for *A.* (*Labialalbum*) *trilineatus* and *A.* (*Labialalbum*) *merceicai sp. nov.*.

D/ Lower light line is on scale rows 6 and 7, and bordered below by a dark line versus not so in *A. buddeni*, and only with black spotting in a linear form in *A. duperreyi*.

E/ 7 or 8 lower labials, usually 7; 5-7 lower labials, usually 5 or 6; 4-6 supraciliaries, usually 5;

7-10 upper ciliaries; 8-15 lower ciliaries; 39-51 fore toe subdigital lamellae; 53-72 hind toe subdigital lamellae; 25-31 midbody scale rows.

A buddeni is separated from *A. duperreyi* by having a light brown, versus dark copper brown dorsum and that the lower light line on the flank has no obvious border, versus one that has black spotting in a linear form in *A. duperreyi*.

The five newly named species *A. adelynhoserae sp. nov.*, *A. jackyhoserae sp. nov.*, *A. granti sp. nov.*, *A. taipanbarnetti sp. nov.* and *A. tybarnetti sp. nov.* are separated from one another by the following unique combinations of characters:

A. adelynhoserae sp. nov. has a mainly chocolate brown dorsum with a well-defined continuous thick, shiny black mid-dorsal stripe commencing from the back of the head and onto the anterior part of the tail, beyond which it breaks up and disintegrates; between the mid-dorsal stripe and the white lateral stripe at the top of the flanks is black spotting running down the back indicative of a dorso-lateral stripe; the white lateral stripe at the top of the flanks is also bounded at the top by a well defined shiny black line and below by the thick black lateral band, with a well defined white band below and below that a well-defined black lower border, with a mainly unmarked white venter. Upper labials are white and either unmarked or with only scattered flecks or scattered tiny spots only. Upper surfaces of the anterior limbs are heavily mottled black.

Many specimens have black spotting on the otherwise dark brown upper surface of the head.

Tail tapers reddish.

A. jackyhoserae sp. nov. is mainly brown on the dorsum with the mid-dorsal stripe barely visible or distinct, being thin (much less than a scale wide), broken in parts and not going beyond the pelvic region onto the tail. The tail is distinctly lighter and more greyish in colour. No obvious spotting or blotches are on the brown coloured upper surface of the head.

The upper boundary of the yellow or white lines on the top of the flanks is thin and barely discernible and greyish in colour, not black. The upper surfaces of the anterior limbs are mainly grey brown in colour with scattered dark spots or lines on the angles of the limbs.

A. granti sp. nov. has a strong greyish wash through the brown dorsum colouration. The mid-dorsal line is black in colour, but is quite evidently of irregular thickness as it runs down the body. The black boundary of the upper surface of the white band at the top of each flank has a jagged edge. The white band on the lower flank is peppered with grey. The brown coloured upper surface of the head may or may not have scattered tiny spots of flecks. Many specimens have scattered black spotting running in lines down either side of the back between the mid dorsal stripe and the top of the flanks.

Tail tapers greyish.

A. taipanbarnetti sp. nov. is similar in appearance in most respects to *A. granti sp. nov.* (see above), but is separated from that species by the presence of grey peppering on the very white upper labials and a greyish-brown as opposed to brown upper surface of the head. The head of this species is obviously marked with darker brownish-black patches within some or most dorsal scales.

Peppering forms a greyish stripe on either side of the upper surface of the anterior tail.

A. taipanbarnetti sp. nov. is further separated from the other four species by extensive cream coloured areas on the sides of the neck and fore-flanks which in turn have scattered brown or grey peppering.

*A. tybarnetti sp. nov.*is readily separated from all the preceding species by a dorsum that to a large extent merges the intensity of the contrasting colours on the dorsum and flanks. The mid dorsal stripe is thick and even along its length, but dark grey as opposed to black. The black lateral stripe is also reduced in intensity, to be dark grey, but the intensity is not reduced as much as the mid-dorsal stripe. The white line along the upper surface of the flank is jagged edged above and below and in turn bounded above by a thick greyish-black line which is not at all jagged edged at the mid body side and 2-3 times as thick as the white line it borders.

The white line on the lower flanks is reduced in width to be less than one scale wide and bound at the bottom by a series of well-defined black triangles on a white background, these triangles being wider than the line itself above. The upper surface of that line is also jagged edged and therefore appears to be somewhat indistinct.

The light brown head is heavily spotted with grey or brown; the upper anterior labials are spotted grey or brown. Forelimbs are light grey with dark flecks or spots.

White surfaces on the sides of the back of the head and neck are heavily peppered with grey spots or flecks. Tail becomes mainly grey.

Species in each of the newly identified subgenera are separated from one another as follows:

Both the nominate subgenus *Acritoscincus* (including the seven species accounted for above) and the subgenus *Labialalbum subgen. nov.* have some indication of one or more pale longitudinal stripes running down the back, these not being consistent with each scale row running down the back.

Other than perhaps dark or black spotting on each scale in each scale row running down the back in some specimens in the subgenus *Celerscincus subgen. nov.* there is no indication of pale striping running down the back.

Celerscincus subgen. nov. is further separated from the other two subgenera by having a body in adults that is noticeably

horizontally flattened and wide, versus not so in the others.

Acritoscincus is readily separated from *Labialalbum subgen. nov*. by the presence of a pale mid lateral stripe with a prominent upper border, versus one that is ill-defined in *Labialalbum subgen. nov*..

Dubey and Shine (2010) found that the three relevant subgenera diverged from one another somewhere between 7.9 and 19.3 MYA, making genus-level recognition for each species group appropriate.

Colour images of *A. adelynhoserae sp. nov.* in life can be found online at:

https://www.inaturalist.org/observations/108930882

and

https://www.inaturalist.org/observations/61070498

and

https://www.inaturalist.org/observations/72589131

and

https://www.inaturalist.org/observations/35083376

and

https://www.inaturalist.org/observations/76346912

A colour image of *A. adelynjackyhoserae sp. nov.* in life can be found online at:

https://www.inaturalist.org/observations/85406397

Colour images of *A. granti sp. nov.* in life can be found online at:

https://www.inaturalist.org/observations/75138008

and

https://www.inaturalist.org/observations/57632755

and

https://www.inaturalist.org/observations/88775040

Colour images of *A. tybarnetti* in life can be found online at:

https://www.inaturalist.org/observations/96410777

and

https://www.inaturalist.org/observations/105075526

Colour images of *A. duperreyi* in life can be found online at:

https://www.inaturalist.org/observations/101430422

and

https://www.inaturalist.org/observations/35913907

and

https://www.inaturalist.org/observations/36463417

and

https://www.inaturalist.org/observations/87192890

Colour images of *A. buddeni* in life can be found in Hoser (1989) at page 103, in second image down from top and online at:

https://www.inaturalist.org/observations/34894404

Dubey and Shine (2010) wrote of the five lineages herein formally named as new species:

"*Within* B. duperreyi*, the estimates dates of divergence between the major lineages began in the Upper Miocene and/or Upper Pliocene (3.9 Myr, 95% HPD: 3.6-5.9; 4.8, 95% HPD 4.2-6.6; 5.7 Myr, 95% HPD: 4.7-6.6; 3.3 Myr, 95% HPD: 2.6-3.7), depending on the calibration method*."

2.6-6.6 MYA is clearly species-level divergence.

Skinks in the genus *Acritoscincus sensu lato* are separated from all other Australasian skink lizards by the following unique suite of characters:

Slightly elongated body, somewhat horizontally flattened; pentadactyle limbs, limbs short, usually just touching when adpressed; parietal shields in contact behind the interparietal; 5-7 (usually 6-7) supraciliaries that are not noticeably enlarged; transparent palpebral disc in a movable lower eyelid; frontoparietals fused to form a single shield; interparietal reduced; supranasals absent; rostral-frontonasal suture is almost as wide as frontal; nasals usually narrowly separated and undivided; ear opening prominent and without lobules; breeding males have a red throat colouration; 60 mm snout-vent in adults with original tail about 150 percent of that.

Dorsal colouration is usually greyish or brownish on the upper surface, with or without flecks or other markings, with dark below that light striping on the flanks of the body. Upper labials usually white or whitish.

Distribution: *A. granti sp. nov*. is a taxon from the hills east of Adelaide and cooler environs in South Australia, including the Fleurieu Peninsula.

Etymology: The new species *A. granti sp. nov.* is named in honour of Scott Grant of Whyalla, South Australia (as of 2021), in recognition of his services to wildlife conservation. He took over the lease on the Whyalla Fauna and Reptile Park, but was within three short years forced to shut down at gunpoint in late 2021. This is because his zoo was too successful and popular with the general public. This meant that his business posed a potential threat to the business success of the government-owned zoos in Adelaide, who prefer to operate in a monopolistic environment, where they are the only or main wildlife experience for the local population.

The announcement of his shut down was in the first instance on his Facebook page where he wrote:

"*Eyre Reptile & Wildlife Park, November 10, 2021*

It is with regret that the operators of the Eyre Reptile and Wildlife Park and Whyalla City Council can confirm that the park is closing as of Monday 15 November.

The park has provided access to a range of wildlife for both the community of Whyalla and visitors over a number of years, helping educate students and enable children to get up-close and interact with some of their favourite animals."

In turn the Murdoch Press via the Adelaide *Advertiser* newspaper did on 15 November, vilified Scott Grant and his business as part of their close relationship to the State Government and doing the bidding for the government's own dysfunctional zoo business.

There was no mention in their "news stories" of the important wildlife conservation work of Grant and his hard working family.

Successful wildlife conservation enterprises in South Australia are routinely shut down by the State Government, an earlier example being the successful Warrawong Sanctuary in the Adelaide Hills, owned by John Walmsley.

The Adelaide Zoo has had some very "successful" captive breeding programs for reptiles, including for the Pygmy Bluetongued Lizard *Lazarusus adelaidensis* (Peters, 1863), see Hoser (1991 and 2016b) for more on this species and the Western Ranges Taipan *Oxyuranus temporalis* Doughty *et al*., 2007.

The "success" of these programs is always measured by them NOT breeding the species, because if they bred them and supplied specimens to other (rival) zoos, then they would lose their monopoly on possession of the species. This would damage their income flow in the form of visitors and cash hands outs from government and business to (supposedly) try to breed these species.

Being the only source of photos of these endangered species is also a massive cash cow. To maintain this monopoly, the lizards are kept behind a double glass fronted cage, in turn with high grass tussocks at the front of the cage, making it effectively impossible for a visitor to the zoo to get any publication-grade photos of the lizards put on display.

The government-granted monopoly that the Adelaide Zoo has on the Pygmy Bluetongued Lizard has been severely undermined in recent years by Queensland based reptile collector, private zoo owner and conservationist David Merceica (see below), who was lucky to get some orphaned specimens from a wildlife rescue group in Tasmania and who has been breeding them in plague numbers ever since.

How those specimens got to Tasmania in the first instance is not known, but Merceica's acquisition of the lizards was wholly legal and much to the consternation of the Adelaide Zoo business.

ACRITOSCINCUS* (*ACRITOSCINCUS*) *TAIPANBARNETTI SP. NOV.

LSIDurn:lsid:zoobank.org:act:EE59BD1A-8594-45B1-BB3D-711E04C25F1B

Holotype: A preserved specimen at the Tasmanian Museum and Art Gallery, Hobart, Tasmania, Australia, specimen number C87, collected at Kangaroo Island, South Australia, Australia, Latitude -35.7620 S., Longitude 137.619 E. This government-owned facility allows access to their holdings.

Paratypes: Four preserved specimens in the South Australian Museum, Adelaide, South Australia, specimen numbers SAM R11685 collected from 6 miles east of Karatta, Kangaroo Island, South Australia, Australia, Latitude 137.05 S., Longitude -35.95 E.; SAM R37407 and R37408 both collected from 12 km east south-east of Karatta, Kangaroo Island, South Australia, Australia, Latitude -36.015 S., Longitude -137.0142 E.; and R37268 collected from 7 km north-east of Vivionne Bay, Kangaroo Island, South Australia, Australia, Latitude -35.9497 S., Longitude 137.2431 E.

Diagnosis: The species *Acritoscincus taipanbarnetti sp. nov.* has until now been treated by most authors as a population of *Acritoscincus duperreyi* (Gray, 1838) *sensu lato* as per Dubey and Shine (2010) and/or Dissanayake *et al.* (2021), noting that they regarded this as a potentially unnamed species.

Acritoscincus duperreyi (Gray, 1838) *sensu lato* as defined by Cogger (2014) and most other authors is herein treated as the following seven species, being:

Acritoscincus duperreyi (Gray, 1838) (type species), herein treated as being confined to Tasmania and the islands immediately offshore to the north.

A. adelynhoserae sp. nov. being found on the Mornington Peninsula south-east of Melbourne, including the shores of Western Port Bay, throughout the Melbourne metropolitan area, but mainly on the outskirts, or (nowadays rarely) larger reserves closer to the city, and west and south-west to about Colac, Victoria.

A buddeni Wells and Wellington, 1985 herein tentatively treated as a separate species to *A. duperreyi* being a species from the ACT and nearby parts of New South Wales and north-east Victoria.

A. jackyhoserae sp. nov. restricted to the Grampians in western Victoria.

A. granti sp. nov. from the hills east of Adelaide and cooler environs in South Australia.

A. taipanbarnetti sp. nov. from Kangaroo Island, South Australia.

A. tybarnetti sp. nov. from the south-east of South Australia.

With the exception of between the species *A. duperreyi* and *A. buddeni*, no evidence has been published suggesting recent gene flow between any of these taxa.

The five newly named species in this subgenus are readily separated from the other two previously named species (*A. duperreyi* and *A. buddeni*) by the following unique suite of characters:

A/ The vertebral stripe is a continuous (line) or occasionally somewhat broken (lines plus spots), except for *A. jackyhoserae sp. nov.* (see below), versus mostly obviously broken or as spots in *A. duperreyi* and *A. buddeni*, (rarely continuous in a few specimens of *A. duperreyi*).

B/ Upper light line does not sit wholly over a row of scales (as it does in *A. duperreyi* and *A. buddeni*).

C/ Dark lateral band at midbody is normally on scale row 3, as opposed to 4 in *A. duperreyi* and *A. buddeni* as well as for *A.* (*Labialalbum*) *trilineatus* and *A.* (*Labialalbum*) *merceicai sp. nov.*.

D/ Lower light line is on scale rows 6 and 7, and bordered below by a dark line versus not so in *A. buddeni*, and only with black spotting in a linear form in *A. duperreyi*.

E/ 7 or 8 lower labials, usually 7; 5-7 lower labials, usually 5 or 6; 4-6 supraciliaries, usually 5;

7-10 upper ciliaries; 8-15 lower ciliaries; 39-51 fore toe subdigital lamellae; 53-72 hind toe subdigital lamellae; 25-31 midbody scale rows.

A buddeni is separated from *A. duperreyi* by having a light brown, versus dark copper brown dorsum and that the lower light line on the flank has no obvious border, versus one that has black spotting in a linear form in *A. duperreyi*.

The five newly named species *A. adelynhoserae sp. nov.*, *A. jackyhoserae sp. nov.*, *A. granti sp. nov.*, *A. taipanbarnetti sp. nov.* and *A. tybarnetti sp. nov.* are separated from one another by the following unique combinations of characters:

A. adelynhoserae sp. nov. has a mainly chocolate brown dorsum with a well-defined continuous thick, shiny black mid-dorsal stripe commencing from the back of the head and onto the anterior part of the tail, beyond which it breaks up and disintegrates; between the mid-dorsal stripe and the white lateral stripe at the top of the flanks is black spotting running down the back indicative of a dorso-lateral stripe; the white lateral stripe at the top of the flanks is also bounded at the top by a well defined shiny black line and below by the thick black lateral band, with a well defined white band below and below that a well-defined black lower border, with a mainly unmarked white venter. Upper labials are white and either unmarked or with only scattered flecks or scattered tiny spots only. Upper surfaces of the anterior limbs are heavily mottled black.

Many specimens have black spotting on the otherwise dark brown upper surface of the head.

Tail tapers reddish.

A. jackyhoserae sp. nov. is mainly brown on the dorsum with the mid-dorsal stripe barely visible or distinct, being thin (much less than a scale wide), broken in parts and not going beyond the pelvic region onto the tail. The tail is distinctly lighter and more greyish in colour. No obvious spotting or blotches are on the brown coloured upper surface of the head.

The upper boundary of the yellow or white lines on the top of the flanks is thin and barely discernible and greyish in colour, not black. The upper surfaces of the anterior limbs are mainly grey brown in colour with scattered dark spots or lines on the angles of the limbs.

A. granti sp. nov. has a strong greyish wash through the brown dorsum colouration. The mid-dorsal line is black in colour, but is quite evidently of irregular thickness as it runs down the body. The black boundary of the upper surface of the white band at the top of each flank has a jagged edge. The white band on the lower flank is peppered with grey. The brown coloured upper surface of the head may or may not have scattered tiny spots of flecks. Many specimens have scattered black spotting running in lines down either side of the back between the mid dorsal stripe and the top of the flanks.

Tail tapers greyish.

A. taipanbarnetti sp. nov. is similar in appearance in most respects to *A. granti sp. nov*. (see above), but is separated from that species by the presence of grey peppering on the very white upper labials and a greyish-brown as opposed to brown upper surface of the head. The head of this species is obviously marked with darker brownish-black patches within some or most dorsal scales.

Peppering forms a greyish stripe on either side of the upper surface of the anterior tail.

A. taipanbarnetti sp. nov. is further separated from the other four species by extensive cream coloured areas on the sides of the neck and fore-flanks which in turn have scattered brown or grey peppering.

*A. tybarnetti sp. nov.*is readily separated from all the preceding species by a dorsum that to a large extent merges the intensity of the contrasting colours on the dorsum and flanks. The mid dorsal stripe is thick and even along its length, but dark grey as opposed to black. The black lateral stripe is also reduced in intensity, to be dark grey, but the intensity is not reduced as much as the mid-dorsal stripe. The white line along the upper

surface of the flank is jagged edged above and below and in turn bounded above by a thick greyish-black line which is not at all jagged edged at the mid body side and 2-3 times as thick as the white line it borders.

The white line on the lower flanks is reduced in width to be less than one scale wide and bound at the bottom by a series of well-defined black triangles on a white background, these triangles being wider than the line itself above. The upper surface of that line is also jagged edged and therefore appears to be somewhat indistinct.

The light brown head is heavily spotted with grey or brown; the upper anterior labials are spotted grey or brown. Forelimbs are light grey with dark flecks or spots.

White surfaces on the sides of the back of the head and neck are heavily peppered with grey spots or flecks. Tail becomes mainly grey.

Species in each of the newly identified subgenera are separated from one another as follows:

Both the nominate subgenus *Acritoscincus* (including the seven species accounted for above) and the subgenus *Labialalbum subgen. nov*. have some indication of one or more pale longitudinal stripes running down the back, these not being consistent with each scale row running down the back.

Other than perhaps dark or black spotting on each scale in each scale row running down the back in some specimens in the subgenus *Celerscincus subgen. nov.* there is no indication of pale striping running down the back.

Celerscincus subgen. nov. is further separated from the other two subgenera by having a body in adults that is noticeably horizontally flattened and wide, versus not so in the others.

Acritoscincus is readily separated from *Labialalbum subgen. nov*. by the presence of a pale mid lateral stripe with a prominent upper border, versus one that is ill-defined in *Labialalbum subgen. nov*..

Dubey and Shine (2010) found that the three relevant subgenera diverged from one another somewhere between 7.9 and 19.3 MYA, making genus-level recognition for each species group appropriate.

Skinks in the genus *Acritoscincus sensu lato* are separated from all other Australasian skink lizards by the following unique suite of characters:

Slightly elongated body, somewhat horizontally flattened; pentadactyle limbs, limbs short, usually just touching when adpressed; parietal shields in contact behind the interparietal; 5-7 (usually 6-7) supraciliaries that are not noticeably enlarged; transparent palpebral disc in a movable lower eyelid; frontoparietals fused to form a single shield; interparietal reduced; supranasals absent; rostral-frontonasal suture is almost as wide as frontal; nasals usually narrowly separated and undivided; ear opening prominent and without lobules; breeding males have a red throat colouration; 60 mm snout-vent in adults with original tail about 150 percent of that.

Dorsal colouration is usually greyish or brownish on the upper surface, with or without flecks or other markings, with dark below that light striping on the flanks of the body. Upper labials usually white or whitish.

Colour images of *A. adelynhoserae sp. nov.* in life can be found online at:

https://www.inaturalist.org/observations/108930882

and

https://www.inaturalist.org/observations/61070498

and

https://www.inaturalist.org/observations/72589131

and

https://www.inaturalist.org/observations/35083376

and

https://www.inaturalist.org/observations/76346912

A colour image of *A. adelynjackyhoserae sp. nov.* in life can be found online at:

https://www.inaturalist.org/observations/85406397

Colour images of *A. granti sp. nov.* in life can be found online at:

https://www.inaturalist.org/observations/75138008

and

https://www.inaturalist.org/observations/57632755

and

https://www.inaturalist.org/observations/88775040

Colour images of *A. tybarnetti* in life can be found online at:

https://www.inaturalist.org/observations/96410777

and

https://www.inaturalist.org/observations/105075526

Colour images of *A. duperreyi* in life can be found online at:

https://www.inaturalist.org/observations/101430422

and

https://www.inaturalist.org/observations/35913907

and

https://www.inaturalist.org/observations/36463417

and

https://www.inaturalist.org/observations/87192890

Colour images of *A. buddeni* in life can be found in Hoser (1989) at page 103, in second image down from top and online at:

https://www.inaturalist.org/observations/34894404

Dubey and Shine (2010) wrote of the five lineages herein formally named as new species:

"*Within* B. duperreyi*, the estimates dates of divergence between the major lineages began in the Upper Miocene and/or Upper Pliocene (3.9 Myr, 95% HPD: 3.6-5.9; 4.8, 95% HPD 4.2-6.6; 5.7 Myr, 95% HPD: 4.7-6.6; 3.3 Myr, 95% HPD: 2.6-3.7), depending on the calibration method*."

2.6-6.6 MYA is clearly species-level divergence.

Distribution: *A. taipanbarnetti sp. nov.* is a species apparently restricted to Kangaroo Island, South Australia.

Etymology: The new species *A. taipanbarnetti sp. nov.* is named in honour of Taipan Brian Joshua Barnett of Sunshine Victoria, Australia, in recognition of his services to sporting in Australia and keeping youth healthy and active in his home city of Melbourne, Australia. His main area of achievement has been in the difficult sport of Kick Boxing, where he has won a number of coveted titles.

Taipan is the son of Ty Thomas Barnett (see below), in turn son of Brian and Lani Barnett, who as part of a team, played a leading and often difficult role for decades running the Victorian Herpetological Society Incorporated.

ACRITOSCINCUS* (*ACRITOSCINCUS*) *TYBARNETTI SP. NOV.

LSIDurn:lsid:zoobank.org:act:9AF9376B-8421-445F-BA5F-432DB33734F1

Holotype: A preserved specimen at the South Australian Museum, Adelaide, South Australia, Australia, specimen number SAM 10671 collected from Euringa, Naracoorte, South Australia, Australia, Latitude -39.67 S., Longitude 140.75 E.

This government-owned facility allows access to its holdings.

Paratypes: Six other preserved specimens at the South Australian Museum, Adelaide, South Australia, Australia, specimen numbers (SAM) R3272, R8875, R10672, 10673, R11134, R11135, all collected from Naracoorte, South Australia, Australia.

Diagnosis: The species *Acritoscincus tybarnetti sp. nov.* has until now been treated by most authors as a population of *Acritoscincus duperreyi* (Gray, 1838) *sensu lato* as per Dubey and Shine (2010) and/or Dissanayake *et al.* (2021), noting that they regarded this as a potentially unnamed species.

Acritoscincus duperreyi (Gray, 1838) *sensu lato* as defined by Cogger (2014) and most other authors is herein treated as the following seven species, being:

Acritoscincus duperreyi (Gray, 1838) (type species), herein

treated as being confined to Tasmania and the islands immediately offshore to the north.

A. adelynhoserae sp. nov. being found on the Mornington Peninsula south-east of Melbourne, including the shores of Western Port Bay, throughout the Melbourne metropolitan area, but mainly on the outskirts, or (nowadays rarely) larger reserves closer to the city, and west and south-west to about Colac, Victoria.

A buddeni Wells and Wellington, 1985 herein tentatively treated as a separate species to *A. duperreyi* being a species from the ACT and nearby parts of New South Wales and north-east Victoria.

A. jackyhoserae sp. nov. restricted to the Grampians in western Victoria.

A. granti sp. nov. from the hills east of Adelaide and cooler environs in South Australia.

A. taipanbarnetti sp. nov. from Kangaroo Island, South Australia.

A. tybarnetti sp. nov. from the south-east of South Australia.

With the exception of between the species *A. duperreyi* and *A. buddeni*, no evidence has been published suggesting recent gene flow between any of these taxa.

The five newly named species in this subgenus are readily separated from the other two previously named species (*A. duperreyi* and *A. buddeni*) by the following unique suite of characters:

A/ The vertebral stripe is a continuous (line) or occasionally somewhat broken (lines plus spots), except for *A. jackyhoserae sp. nov.* (see below), versus mostly obviously broken or as spots in *A. duperreyi* and *A. buddeni*, (rarely continuous in a few specimens of *A. duperreyi*).

B/ Upper light line does not sit wholly over a row of scales (as it does in *A. duperreyi* and *A. buddeni*).

C/ Dark lateral band at midbody is normally on scale row 3, as opposed to 4 in *A. duperreyi* and *A. buddeni* as well as for *A.* (*Labialalbum*) *trilineatus* and *A.* (*Labialalbum*) *merceicai sp. nov.*.

D/ Lower light line is on scale rows 6 and 7, and bordered below by a dark line versus not so in *A. buddeni*, and only with black spotting in a linear form in *A. duperreyi*.

E/ 7 or 8 lower labials, usually 7; 5-7 lower labials, usually 5 or 6; 4-6 supraciliaries, usually 5;

7-10 upper ciliaries; 8-15 lower ciliaries; 39-51 fore toe subdigital lamellae; 53-72 hind toe subdigital lamellae; 25-31 midbody scale rows.

A buddeni is separated from *A. duperreyi* by having a light brown, versus dark copper brown dorsum and that the lower light line on the flank has no obvious border, versus one that has black spotting in a linear form in *A. duperreyi*.

The five newly named species *A. adelynhoserae sp. nov.*, *A. jackyhoserae sp. nov.*, *A. granti sp. nov.*, *A. taipanbarnetti sp. nov.* and *A. tybarnetti sp. nov.* are separated from one another by the following unique combinations of characters:

A. adelynhoserae sp. nov. has a mainly chocolate brown dorsum with a well-defined continuous thick, shiny black mid-dorsal stripe commencing from the back of the head and onto the anterior part of the tail, beyond which it breaks up and disintegrates; between the mid-dorsal stripe and the white lateral stripe at the top of the flanks is black spotting running down the back indicative of a dorso-lateral stripe; the white lateral stripe at the top of the flanks is also bounded at the top by a well defined shiny black line and below by the thick black lateral band, with a well defined white band below and below that a well-defined black lower border, with a mainly unmarked white venter. Upper labials are white and either unmarked or with only scattered flecks or scattered tiny spots only. Upper surfaces of the anterior limbs are heavily mottled black.

Many specimens have black spotting on the otherwise dark brown upper surface of the head.

Tail tapers reddish.

A. jackyhoserae sp. nov. is mainly brown on the dorsum with the mid-dorsal stripe barely visible or distinct, being thin (much less than a scale wide), broken in parts and not going beyond the pelvic region onto the tail. The tail is distinctly lighter and more greyish in colour. No obvious spotting or blotches are on the brown coloured upper surface of the head.

The upper boundary of the yellow or white lines on the top of the flanks is thin and barely discernible and greyish in colour, not black. The upper surfaces of the anterior limbs are mainly grey brown in colour with scattered dark spots or lines on the angles of the limbs.

A. granti sp. nov. has a strong greyish wash through the brown dorsum colouration. The mid-dorsal line is black in colour, but is quite evidently of irregular thickness as it runs down the body. The black boundary of the upper surface of the white band at the top of each flank has a jagged edge. The white band on the lower flank is peppered with grey. The brown coloured upper surface of the head may or may not have scattered tiny spots of flecks. Many specimens have scattered black spotting running in lines down either side of the back between the mid dorsal stripe and the top of the flanks.

Tail tapers greyish.

A. taipanbarnetti sp. nov. is similar in appearance in most respects to *A. granti sp. nov.* (see above), but is separated from that species by the presence of grey peppering on the very white upper labials and a greyish-brown as opposed to brown upper surface of the head. The head of this species is obviously marked with darker brownish-black patches within some or most dorsal scales.

Peppering forms a greyish stripe on either side of the upper surface of the anterior tail.

A. taipanbarnetti sp. nov. is further separated from the other four species by extensive cream coloured areas on the sides of the neck and fore-flanks which in turn have scattered brown or grey peppering.

*A. tybarnetti sp. nov.*is readily separated from all the preceding species by a dorsum that to a large extent merges the intensity of the contrasting colours on the dorsum and flanks. The mid dorsal stripe is thick and even along its length, but dark grey as opposed to black. The black lateral stripe is also reduced in intensity, to be dark grey, but the intensity is not reduced as much as the mid-dorsal stripe. The white line along the upper surface of the flank is jagged edged above and below and in turn bounded above by a thick greyish-black line which is not at all jagged edged at the mid body side and 2-3 times as thick as the white line it borders.

The white line on the lower flanks is reduced in width to be less than one scale wide and bound at the bottom by a series of well-defined black triangles on a white background, these triangles being wider than the line itself above. The upper surface of that line is also jagged edged and therefore appears to be somewhat indistinct.

The light brown head is heavily spotted with grey or brown; the upper anterior labials are spotted grey or brown. Forelimbs are light grey with dark flecks or spots.

White surfaces on the sides of the back of the head and neck are heavily peppered with grey spots or flecks. Tail becomes mainly grey.

Species in each of the newly identified subgenera are separated from one another as follows:

Both the nominate subgenus *Acritoscincus* (including the seven species accounted for above) and the subgenus *Labialalbum subgen. nov.* have some indication of one or more pale longitudinal stripes running down the back, these not being consistent with each scale row running down the back.

Other than perhaps dark or black spotting on each scale in each scale row running down the back in some specimens in the subgenus *Celerscincus subgen. nov.* there is no indication of pale striping running down the back.

Celerscincus subgen. nov. is further separated from the other

two subgenera by having a body in adults that is noticeably horizontally flattened and wide, versus not so in the others.

Acritoscincus is readily separated from *Labialalbum subgen. nov.* by the presence of a pale mid lateral stripe with a prominent upper border, versus one that is ill-defined in *Labialalbum subgen. nov.*.

Dubey and Shine (2010) found that the three relevant subgenera diverged from one another somewhere between 7.9 and 19.3 MYA, making genus-level recognition for each species group appropriate.

Skinks in the genus *Acritoscincus sensu lato* are separated from all other Australasian skink lizards by the following unique suite of characters:

Slightly elongated body, somewhat horizontally flattened; pentadactyle limbs, limbs short, usually just touching when adpressed; parietal shields in contact behind the interparietal; 5-7 (usually 6-7) supraciliaries that are not noticeably enlarged; transparent palpebral disc in a movable lower eyelid; frontoparietals fused to form a single shield; interparietal reduced; supranasals absent; rostral-frontonasal suture is almost as wide as frontal; nasals usually narrowly separated and undivided; ear opening prominent and without lobules; breeding males have a red throat colouration; 60 mm snout-vent in adults with original tail about 150 percent of that.

Dorsal colouration is usually greyish or brownish on the upper surface, with or without flecks or other markings, with dark below that light striping on the flanks of the body. Upper labials usually white or whitish.

Colour images of *A. adelynhoserae sp. nov.* in life can be found online at:

https://www.inaturalist.org/observations/108930882

and

https://www.inaturalist.org/observations/61070498

and

https://www.inaturalist.org/observations/72589131

and

https://www.inaturalist.org/observations/35083376

and

https://www.inaturalist.org/observations/76346912

A colour image of *A. adelynjackyhoserae sp. nov.* in life can be found online at:

https://www.inaturalist.org/observations/85406397

Colour images of *A. granti sp. nov.* in life can be found online at:

https://www.inaturalist.org/observations/75138008

and

https://www.inaturalist.org/observations/57632755

and

https://www.inaturalist.org/observations/88775040

Colour images of *A. tybarnetti* in life can be found online at:

https://www.inaturalist.org/observations/96410777

and

https://www.inaturalist.org/observations/105075526

Colour images of *A. duperreyi* in life can be found online at:

https://www.inaturalist.org/observations/101430422

and

https://www.inaturalist.org/observations/35913907

and

https://www.inaturalist.org/observations/36463417

and

https://www.inaturalist.org/observations/87192890

Colour images of *A. buddeni* in life can be found in Hoser (1989) at page 103, in second image down from top and online at:

https://www.inaturalist.org/observations/34894404

Dubey and Shine (2010) wrote of the five lineages herein formally named as new species:

"*Within* B. duperreyi*, the estimates dates of divergence between the major lineages began in the Upper Miocene and/or Upper Pliocene (3.9 Myr, 95% HPD: 3.6-5.9; 4.8, 95% HPD 4.2-6.6; 5.7 Myr, 95% HPD: 4.7-6.6; 3.3 Myr, 95% HPD: 2.6-3.7), depending on the calibration method.*"

2.6-6.6 MYA is clearly species-level divergence.

Distribution: *A. tybarnetti sp. nov.* is a taxon from the south-east of South Australia, generally south-east of the mouth of the Murray River in a triangle generally east and south of Meningie, Latitude -35.6900 S., Longitude 139.3370 E. to the Victorian state border, although it presumably includes specimens recorded just east of there in continuous habitat.

Etymology: The new species *A. tybarnetti sp. nov.* is named in honour of Ty Thomas Barnett of Ardeer and more recently Sunshine, Victoria, Australia, in recognition of his services to herpetology in Australia.

Ty Thomas Barnett is one of two sons of Brian and Lani Barnett, all of whom as part of a team, played a leading and often difficult role for decades running the Victorian Herpetological Society Incorporated.

ACRITOSCINCUS* (*LABIALALBUM*) *DAVIDMERCEICAI SP. NOV.

LSIDurn:lsid:zoobank.org:act:5F90F167-B3EA-41BE-A4B1-AE4128E7CA35

Holotype: A preserved specimen at the South Australian Museum, Adelaide, South Australia, Australia, specimen number SAM R65844 collected from Lincoln National Park, 13.44 km East of Port Lincoln, South Australia, Australia, Latitude -34.7008 S., Longitude 135.7119 E. This government-owned facility allows access to its holdings.

Paratypes: Five preserved specimens at the South Australian Museum, Adelaide, South Australia, Australia, specimen numbers (SAM) R29032 collected from Duck Ponds Creek, Lincoln National Park, South Australia, Australia, Latitude -34.78 S., Longitude 135.78 E.; R42216 collected from Lincoln National Park, South Australia, Australia, Latitude -34.83 S., Longitude 135.92 E.; R54791 collected from 12.7 km South of Port Lincoln, South Australia, Australia, Latitude -34.8425 S., Longitude 135.8789 E.; R56526 collected from 12.7 km south of Port Lincoln, South Australia, Australia, Latitude -34.8425 S., Longitude -135.8789 E.; R65837 collected from Lincoln National Park, 17 km East of Port Lincoln, South Australia, Australia, Latitude -34.7033 S., Longitude 135.6728 E.

Diagnosis: Until now, *Acritoscincus davidmerceicai sp. nov.* has been treated as an eastern outlier population of the otherwise Western Australian species *A. trilineatus* (Gray, 1838).

That species has been recorded as far east as Bilbanya Dunes (near Eucla) on the western edge of the Nullarbor Plains.

A. davidmerceicai sp. nov. is readily separated from *A. trilineatus* by its obviously brownish coloured original tail for most of its length in living adults, versus greyish to even blackish in *A. trilineatus*; faded black on the flanks, better described as being greyish brown, of living adult lizards, versus a distinct shiny black in *A. trilineatus*; tiny spots on scales on the back merge to form tiny distinctive lines down the back, whereas in *A. trilineatus* these spots are either absent, or if present are only few and scattered and not forming any obvious longitudinal lines.

Species in each of the newly identified subgenera are separated from one another as follows:

Both the nominate subgenus *Acritoscincus* (including the seven species accounted for in descriptions above) and the subgenus *Labialalbum subgen. nov.* (including *Acritoscincus davidmerceicai sp. nov.* and *A. trilineatus* (Gray, 1838), being the entirety of this subgenus) have some indication of one or more pale longitudinal stripes running down the back, these not being consistent with each scale row running down the back.

Other than perhaps dark or black spotting on each scale in each scale row running down the back in some specimens in the

subgenus *Celerscincus subgen. nov.* there is no indication of pale striping running down the back.

Celerscincus subgen. nov. is further separated from the other two subgenera by having a body in adults that is noticeably horizontally flattened and wide, versus not so in the others.

Acritoscincus is readily separated from *Labialalbum subgen. nov*. by the presence of a pale mid lateral stripe with a prominent upper border, versus one that is ill-defined in *Labialalbum subgen. nov.*.

Dubey and Shine (2010) found that the three relevant subgenera diverged from one another somewhere between 7.9 and 19.3 MYA, making genus-level recognition for each species group appropriate.

Skinks in the genus *Acritoscincus sensu lato* are separated from all other Australasian skink lizards by the following unique suite of characters:

Slightly elongated body, somewhat horizontally flattened; pentadactyle limbs, limbs short, usually just touching when adpressed; parietal shields in contact behind the interparietal; 5-7 (usually 6-7) supraciliaries that are not noticeably enlarged; transparent palpebral disc in a movable lower eyelid; frontoparietals fused to form a single shield; interparietal reduced; supranasals absent; rostral-frontonasal suture is almost as wide as frontal; nasals usually narrowly separated and undivided; ear opening prominent and without lobules; breeding males have a red throat colouration; 60 mm snout-vent in adults with original tail about 150 percent of that.

Dorsal colouration is usually greyish or brownish on the upper surface, with or without flecks or other markings, with dark below that light striping on the flanks of the body. Upper labials usually white or whitish.

Photos of *Acritoscincus* (*Labialalbum*) *davidmerceicai sp. nov*. in life can be found online at:

https://www.flickr.com/photos/127392361@N04/49229558443/

and

https://www.flickr.com/photos/126237772@N07/33194790218/

and

https://www.flickr.com/photos/akashsherping/49442831571/

and

https://www.flickr.com/photos/141624833@N03/50222184538/

Photos of *Acritoscincus* (*Labialalbum*) *trilineatus* in life can be found in Cogger (2014) on page 413 top, Wilson and Swan (2017) on page 183 and online at:

https://www.flickr.com/photos/142447841@N06/48696458113/

and

https://www.inaturalist.org/observations/106481420

and

https://www.inaturalist.org/observations/108582485

and

https://www.inaturalist.org/observations/18278181

Distribution: *Acritoscincus* (*Labialalbum*) *davidmerceicai sp. nov*. is known only from the lower Eyre Peninsula in South Australia, Australia in a line generally south of Louth Bay, Longitude 34.5436 S in the east and Mount Dutton Bay in the west.

Etymology: *Acritoscincus* (*Labialalbum*) *davidmerceicai sp. nov*. is named in honour of David Merceica, formerly of Victoria, Australia, now of Queensland, Australia, a businessman and now owner of Snakes Downunder Reptile Park and Zoo, at 51 Lucketts Rd, Childers, Queensland, 4660, Australia.

Merceica has made significant contributions to herpetology in Australia, with particular emphasis on captive breeding rare and sought after species, including the Pygmy Bluetongued Lizard *Lazarusus adelaidensis* (Peters, 1863), see Hoser (1991 and 2016b) for more on this species, and White-lipped pythons *Leiopython albertisi* (Peters and Doria, 1878) and *Leiopython hoserae* Hoser, 2000.

The names *Leiopython albertisi* (Peters and Doria, 1878) and *Leiopython hoserae* Hoser, 2000 have date priority over the several synonyms illegally coined and promulgated by the Wolfgang Wüster gang through their member Wulf Schleip in a series of acts of taxonomic vandalism (see Hoser 2015a-f for details).

Contrary to the numerous fictitious species and names on "The Reptile Database", there are in fact only two species of White-lipped Python, being *Leiopython albertisi* (Peters and Doria, 1878) and *Leiopython hoserae* Hoser, 2000.

ACRITOSCINCUS* (*CELERSCINCUS*) *KATRINAHOSERAE SP. NOV.

LSIDurn:lsid:zoobank.org:act:3FFA23AB-3392-4C9A-8880-80AAE910529F

Holotype: A preserved specimen at the South Australian Museum, Adelaide, South Australia, Australia, specimen number R34687 collected from 1 km west of Cooma Airport, New South Wales, Australia, Latitude -36.24 S., Longitude 149.12 E. This government-owned facility allows access to its holdings.

Paratypes: 1/ A preserved specimen at the South Australian Museum, Adelaide, South Australia, Australia, specimen number R34688 collected from 1 km west of Cooma Airport, New South Wales, Australia, Latitude -36.24 S., Longitude 149.12 E. 2/ A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.27947 collected from Adaminaby, New South Wales, Australia, Latitude -36.0 S., Longitude 148.783 S. 3/ A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.27949 collected 14 miles from Adaminaby, New South Wales, Australia, Latitude -36.0 S., Longitude 148.766 E.

Diagnosis: Until now, all authors except for Wells and Wellington (1985) have treated putative *A. platynotus* (Peters, 1881) as a single species ranging from north-east Victoria along the New South Wales coast and nearby uplands, to far south-east Queensland.

However following on from the genetic evidence of Dubey and Shine (2010), aligned with known biogeographical barriers affecting similarly constrained species and morphological divergences between populations, that putative species is herein recognized as four.

A. platynotus is confined to the proximal Sydney region, including nearby sandstone plateaus and lower Blue Mountains, generally east of Wentworth Falls.

Specimens from Kanangra Boyd National Park, to the west of the Upper Blue Mountains, west of Sydney and Morton National Park, south of Sydney and inland from Nowra are recognized herein as a subspecies of *A. platynotus*, namely *A. platynotus diversus subsp. nov.*.

Specimens from the New England region of New South Wales are referred to the species *A. donnellani* Wells and Wellington, 1985.

Specimens from the Giraween National Park area of far southern Queensland are referred to the new species *A. paulwoolfi sp. nov.*.

Specimens from high country generally south of the ACT within the ACT, into New South Wales south of there and into far northern Victoria are referred to the species *A. katrinahoserae sp. nov.*.

The four species are separated from one another by the following suites of characters:

Adult *A. platynotus* have a generally unmarked dorsum, being light greyish to light brown in colour. There is a uniform sheen, generally lacking in etchings of scales, and few if any spots or speckles on the upper surface, although some specimens do have rows of scattered tiny grey spots running in lines down the dorsum.

The subspecies *A. platynotus diversus subsp. nov*. is similar in most respects to nominate *A. platynotus platynotus*, but differs from that taxon by having numerous tiny grey dots running in

lines down the dorsum, as well as extensive grey specking on the tail, which is absent in *A. platynotus platynotus*.

A. katrinahoserae sp. nov. is readily separated from the other three species by having what in life appears to be a dark silvery grey dorsum, formed in large part by the presence of dark greyish-black etchings of the dorsal scales, not seen in any of the other species and giving it scales that look fish-like. In some relatively uncommon yellowish brown specimens, the fish-like scales remain because they in turn have black etching. The lower parts of the anterior upper labials are more-or-less barred or spotted with large amounts of blackish-brown, versus a minimal amount in *A. platynotus*, which are mainly whitish here. The lower part of the anterior upper labials are whitish in *A. donnellani* and whitish and heavily marbled brown in *A. woolfi sp. nov.*.

A. katrinahoserae sp. nov. is readily separated from all other species in the subgenus by having limbs that are mainly black in colour.

The head of *A. katrinahoserae sp. nov.* is brown with blackish marbling, versus light grey or light brown, with either no markings or just a few tiny flecks in both subspecies of *A. platynotus*.

Both *A. donnellani* and *A. paulwoolfi sp. nov.* are readily separated from the other two species in the subgenus by having two large reddish brown spots on the otherwise white or whitish posterior upper labials.

These spots are largest and most prominent in *A. donnellani.*

A. donellani is separated from *A. paulwoolfi sp. nov.* by having a dorsum that has scales with tiny black dots forming longitudinal lines down the back, whereas in *A. paulwoolfi sp. nov.*, the scales are dark grey etched to give a more fish-like appearance to the scales of the dorsum, but overall the dorsum is brownish in colour, versus silvery grey in *A. katrinahoserae sp. nov.*.

A. paulwoolfi sp. nov. is the only species in the group for which adults have a significant amount of black etching on the edges of the scales on the upper surface of head. The other species either have no markings or just scattered spots on the upper surfaces of the head.

Species in each of the newly identified subgenera within *Acritoscincus* are separated from one another as follows:

Both the nominate subgenus *Acritoscincus* (including the seven species accounted for in descriptions above) and the subgenus *Labialalbum subgen. nov.* (including *Acritoscincus davidmerceicai sp. nov.* and *A. trilineatus* (Gray, 1838), being the entirety of that subgenus) have some indication of one or more pale longitudinal stripes running down the back, these not being consistent with each scale row running down the back.

Celerscincus subgen. nov. including all of *Acritoscincus* (*Celerscincus*) *katrinahoserae sp. nov.* (type species), *A.* (*Celerscincus*) *donnellani* Wells and Wellington, 1985, *A.* (*Celerscincus*) *paulwoolfi sp. nov.* and *A.* (*Celerscincus*) *platynotus* (Peters, 1881), is separated from the other two subgenera by having a body in adults that is noticeably horizontally flattened and wide, versus not so in the others.

Other than perhaps dark or black spotting on each scale in each scale row running down the back in some specimens in the subgenus *Celerscincus subgen. nov.* there is no indication of pale striping running down the back.

Acritoscincus is readily separated from *Labialalbum subgen. nov.* by the presence of a pale mid lateral stripe with a prominent upper border, versus one that is ill-defined in *Labialalbum subgen. nov.*.

Dubey and Shine (2010) found that the three relevant subgenera diverged from one another somewhere between 7.9 and 19.3 MYA, making genus-level recognition for each species group appropriate.

Skinks in the genus *Acritoscincus sensu lato* are separated from all other Australasian skink lizards by the following unique suite of characters:

Slightly elongated body, somewhat horizontally flattened; pentadactyle limbs, limbs short, usually just touching when adpressed; parietal shields in contact behind the interparietal; 5-7 (usually 6-7) supraciliaries that are not noticeably enlarged; transparent palpebral disc in a movable lower eyelid; frontoparietals fused to form a single shield; interparietal reduced; supranasals absent; rostral-frontonasal suture is almost as wide as frontal; nasals usually narrowly separated and undivided; ear opening prominent and without lobules; breeding males have a red throat colouration; 60 mm snout-vent in adults with original tail about 150 percent of that.

Dorsal colouration is usually greyish or brownish on the upper surface, with or without flecks or other markings, with dark below that light striping on the flanks of the body. Upper labials usually white or whitish.

Nominate *A. platynotus platynotus* in life are depicted in Hoser (1989) on page 103 top right and online at:
https://www.inaturalist.org/observations/65928965
and
https://www.inaturalist.org/observations/71472754
and
https://www.inaturalist.org/observations/46468498
and
https://www.inaturalist.org/observations/16062112
and
https://www.inaturalist.org/observations/51323882

A. platynotus diversus subsp. nov. are depicted in life online at:
https://www.inaturalist.org/observations/12482330
and
https://www.inaturalist.org/observations/64720946
and
https://www.inaturalist.org/observations/58351449

A. katrinahoserae sp. nov. are depicted in life in Cogger (2014) on page 413 top left and online at:
https://www.inaturalist.org/observations/108005387
and
https://www.inaturalist.org/observations/33471128

A. donnellani are depicted in life online at:
https://www.inaturalist.org/observations/31211532
and
https://www.inaturalist.org/observations/39446066
and
https://www.flickr.com/photos/23031163@N03/15287880850/

A. paulwoolfi sp. nov. are depicted in life in Wilson (2015) on page 92 and online at:
https://www.inaturalist.org/observations/7831517
and
https://www.inaturalist.org/observations/101061013

Dubey and Shine (2010) wrote of the lineages herein formally identified herein as new species:

"*Within* B. platynota*, the splits between the major lineages began in the Lower and Upper*

Pliocene (3.2 Myr, 95% HPD: 3.2–5.3; 4.3, 95% HPD 3.7–5.9; 4.4 Myr, 95% HPD: 4.1–5.9; 2.3 Myr, 95% HPD: 2.3–3.3)."

Exceptional to the above is for the species *B. paulwoolfi* for which no genetic material was available to Dubey and Shine (2010), but which is separated from more southern populations by a biogeographic barrier of known antiquity in far northern New South Wales affecting similarly constrained reptile taxa, that occupy rocky habitats (see the three relevant species pair examples in Hoser 2016a, 2017 and 2018, split between the Granite belt of far southern Queensland and the New England region of New South Wales further south, generally south of Inverell and Glen Innes).

Distribution: *A. katrinahoserae sp. nov.* occurs in high country generally south of the ACT within the ACT, into New South

Wales south of there and into far northern Victoria.

Etymology: *A. katrinahoserae sp. nov*. is named in honour of Katrina Hoser, the mother of myself for often unrewarded and largely unknown contributions to herpetology over a lifetime.

ACRITOSCINCUS* (*CELERSCINCUS*) *PAULWOOLFI SP. NOV.

LSIDurn:lsid:zoobank.org:act:53DE1722-EF22-45C6-9C1F-16745A8DE8A0

Holotype: A preserved specimen in the Queensland Museum, Brisbane, Queensland, Australia, specimen number J49605 collected at the Giraween National Park, Queensland, Australia, Latitude -28.833333 S., Longitude 151.866667 E. This government-owned facility allows access to its holdings.

Paratypes: Six preserved specimens in the Queensland Museum, Brisbane, Queensland, Australia, specimen numbers J22757 and J46192 collected from Giraween National Park, via Stanthorpe, Queensland, Australia, Latitude -28.833333 S., Longitude 151.916667 E.; specimen numbers J13930, J36131, J36132 collected from Wyberba, via Stanthorpe Queensland, Australia, Latitude -28.866667 S., Longitude 151.866667 E.; J24210 collected from near Wyperba, Queensland, Australia, Latitude -28.866667 S., Longitude 151.866667 E.

Diagnosis: Until now, all authors except for Wells and Wellington (1985) have treated putative *A. platynotus* (Peters, 1881) as a single species ranging from north-east Victoria along the New South Wales coast and nearby uplands, to far south-east Queensland.

However following on from the genetic evidence of Dubey and Shine (2010), aligned with known biogeographical barriers affecting similarly constrained species and morphological divergences between populations, that putative species is herein recognized as four.

A. platynotus is confined to the proximal Sydney region, including nearby sandstone plateaus and lower Blue Mountains, generally east of Wentworth Falls.

Specimens from Kanangra Boyd National Park, to the west of the Upper Blue Mountains, west of Sydney and Morton National Park, south of Sydney and inland from Nowra are recognized herein as a subspecies of *A. platynotus*, namely *A. platynotus diversus subsp. nov.*.

Specimens from the New England region of New South Wales are referred to the species *A. donnellani* Wells and Wellington, 1985.

Specimens from the Giraween National Park area of far southern Queensland are referred to the new species *A. paulwoolfi sp. nov*.

Specimens from high country generally south of the ACT within the ACT, into New South Wales south of there and into far northern Victoria are referred to the species *A. katrinahoserae sp. nov*..

The four species are separated from one another by the following suites of characters:

Adult *A. platynotus* have a generally unmarked dorsum, being light greyish to light brown in colour. There is a uniform sheen, generally lacking in etchings of scales, and few if any spots or speckles on the upper surface, although some specimens do have rows of scattered tiny grey spots running in lines down the dorsum.

The subspecies *A. platynotus diversus subsp. nov*. is similar in most respects to nominate *A. platynotus platynotus*, but differs from that taxon by having numerous tiny grey dots running in lines down the dorsum, as well as extensive grey specking on the tail, which is absent in *A. platynotus platynotus*.

A. katrinahoserae sp. nov. is readily separated from the other three species by having what in life appears to be a dark silvery grey dorsum, formed in large part by the presence of dark greyish-black etchings of the dorsal scales, not seen in any of the other species and giving it scales that look fish-like. In some relatively uncommon yellowish brown specimens, the fish-like scales remain because they in turn have black etching. The lower parts of the anterior upper labials are more-or-less barred or spotted with large amounts of blackish-brown, versus a minimal amount in *A. platynotus*, which are mainly whitish here. The lower part of the anterior upper labials are whitish in *A. donnellani* and whitish and heavily marbled brown in *A. woolfi sp. nov.*.

A. katrinahoserae sp. nov. is readily separated from all other species in the subgenus by having limbs that are mainly black in colour.

The head of *A. katrinahoserae sp. nov*. is brown with blackish marbling, versus light grey or light brown, with either no markings or just a few tiny flecks in both subspecies of *A. platynotus*.

Both *A. donnellani* and *A. paulwoolfi sp. nov*. are readily separated from the other two species in the subgenus by having two large reddish brown spots on the otherwise white or whitish posterior upper labials.

These spots are largest and most prominent in *A. donnellani.*

A. donellani is separated from *A. paulwoolfi sp. nov*. by having a dorsum that has scales with tiny black dots forming longitudinal lines down the back, whereas in *A. paulwoolfi sp. nov.*, the scales are dark grey etched to give a more fish-like appearance to the scales of the dorsum, but overall the dorsum is brownish in colour, versus silvery grey in *A. katrinahoserae sp. nov.*.

A. paulwoolfi sp. nov. is the only species in the group for which adults have a significant amount of black etching on the edges of the scales on the upper surface of head. The other species either have no markings or just scattered spots on the upper surfaces of the head.

Species in each of the newly identified subgenera within *Acritoscincus* are separated from one another as follows:

Both the nominate subgenus *Acritoscincus* (including the seven species accounted for in descriptions above) and the subgenus *Labialalbum subgen. nov*. (including *Acritoscincus davidmerceicai sp. nov*. and *A. trilineatus* (Gray, 1838), being the entirety of that subgenus) have some indication of one or more pale longitudinal stripes running down the back, these not being consistent with each scale row running down the back.

Celerscincus subgen. nov. including all of *Acritoscincus* (*Celerscincus*) *katrinahoserae sp. nov*. (type species), *A.* (*Celerscincus*) *donnellani* Wells and Wellington, 1985, *A.* (*Celerscincus*) *paulwoolfi sp. nov.* and *A.* (*Celerscincus*) *platynotus* (Peters, 1881), is separated from the other two subgenera by having a body in adults that is noticeably horizontally flattened and wide, versus not so in the others.

Other than perhaps dark or black spotting on each scale in each scale row running down the back in some specimens in the subgenus *Celerscincus subgen. nov.* there is no indication of pale striping running down the back.

Acritoscincus is readily separated from *Labialalbum subgen. nov*. by the presence of a pale mid lateral stripe with a prominent upper border, versus one that is ill-defined in *Labialalbum subgen. nov.*.

Dubey and Shine (2010) found that the three relevant subgenera diverged from one another somewhere between 7.9 and 19.3 MYA, making genus-level recognition for each species group appropriate.

Skinks in the genus *Acritoscincus sensu lato* are separated from all other Australasian skink lizards by the following unique suite of characters:

Slightly elongated body, somewhat horizontally flattened; pentadactyle limbs, limbs short, usually just touching when adpressed; parietal shields in contact behind the interparietal; 5-7 (usually 6-7) supraciliaries that are not noticeably enlarged; transparent palpebral disc in a movable lower eyelid; frontoparietals fused to form a single shield; interparietal reduced; supranasals absent; rostral-frontonasal suture is almost as wide as frontal; nasals usually narrowly separated and undivided; ear opening prominent and without lobules; breeding

males have a red throat colouration; 60 mm snout-vent in adults with original tail about 150 percent of that.

Dorsal colouration is usually greyish or brownish on the upper surface, with or without flecks or other markings, with dark below that light striping on the flanks of the body. Upper labials usually white or whitish.

Nominate *A. platynotus platynotus* in life are depicted in Hoser (1989) on page 103 top right and online at:

https://www.inaturalist.org/observations/65928965

and

https://www.inaturalist.org/observations/71472754

and

https://www.inaturalist.org/observations/46468498

and

https://www.inaturalist.org/observations/16062112

and

https://www.inaturalist.org/observations/51323882

A. platynotus diversus subsp. nov. are depicted in life online at:

https://www.inaturalist.org/observations/12482330

and

https://www.inaturalist.org/observations/64720946

and

https://www.inaturalist.org/observations/58351449

A. katrinahoserae sp. nov. are depicted in life in Cogger (2014) on page 413 top left and online at:

https://www.inaturalist.org/observations/108005387

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A. donnellani are depicted in life online at:

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https://www.inaturalist.org/observations/39446066

and

https://www.flickr.com/photos/23031163@N03/15287880850/

A. paulwoolfi sp. nov. are depicted in life in Wilson (2015) on page 92 and online at:

https://www.inaturalist.org/observations/7831517

and

https://www.inaturalist.org/observations/101061013

Dubey and Shine (2010) wrote of the lineages herein formally identified herein as new species:

"*Within* B. platynota*, the splits between the major lineages began in the Lower and Upper Pliocene (3.2 Myr, 95% HPD: 3.2–5.3; 4.3, 95% HPD 3.7–5.9; 4.4 Myr, 95% HPD: 4.1–5.9; 2.3 Myr, 95% HPD: 2.3–3.3*)."

Exceptional to the above is for the species *B. paulwoolfi* for which no genetic material was available to Dubey and Shine (2010), but which is separated from more southern populations by a biogeographic barrier of known antiquity in far northern New South Wales affecting similarly constrained reptile taxa, that occupy rocky habitats (see the three relevant species pair examples in Hoser 2016a, 2017 and 2018, split between the Granite belt of far southern Queensland and the New England region of New South Wales further south, generally south of Inverell and Glen Innes).

Distribution: *A. paulwoolfi sp. nov.* is known only from the Granite country in and near Giraween National Park in far southern Queensland, Australia.

Etymology: *A. paulwoolfi sp. nov.* is named in honour of Paul Woolf of Walloon, near Ipswich, Queensland, Australia in recognition of many decades contributions to herpetology in Australia, including as foundation president of the Herpetological Society of Queensland Incorporated.

He has also provided logistical support for scientific expeditions across Queensland, other parts of Australia and also outside Australia to assist in discovery of new taxa.

ACRITOSCINCUS* (*CELERSCINCUS*) *PLATYNOTUS DIVERSUS SUBSP. NOV.

LSIDurn:lsid:zoobank.org:act:0498E577-FD94-4395-B28E-F3A1D6A41783

Holotype: A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.15292 collected at Kanangra Walls, New South Wales, Australia, Latitude -33.983 S., Longitude 150.133 E. This government-owned facility allows access to its holdings.

Paratype: A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.15293 collected at Kanangra Walls, New South Wales, Australia, Latitude -33.983 S., Longitude 150.133 E.

Diagnosis: Until now, all authors except for Wells and Wellington (1985) have treated putative *A. platynotus* (Peters, 1881) as a single species ranging from north-east Victoria along the New South Wales coast and nearby uplands, to far south-east Queensland. However following on from the genetic evidence of Dubey and Shine (2010), aligned with known biogeographical barriers affecting similarly constrained species and morphological divergences between populations, that putative species is herein recognized as four.

A. platynotus is confined to the proximal Sydney region, including nearby sandstone plateaus and lower Blue Mountains, generally east of Wentworth Falls.

Specimens from Kanangra Boyd National Park, to the west of the Upper Blue Mountains, west of Sydney and Morton National Park, south of Sydney and inland from Nowra are recognized herein as a subspecies of *A. platynotus*, namely *A. platynotus diversus subsp. nov.*.

Specimens from the New England region of New South Wales are referred to the species *A. donnellani* Wells and Wellington, 1985.

Specimens from the Giraween National Park area of far southern Queensland are referred to the new species *A. paulwoolfi sp. nov.*

Specimens from high country generally south of the ACT within the ACT, into New South Wales south of there and into far northern Victoria are referred to the species *A. katrinahoserae sp. nov.*.

The four species are separated from one another by the following suites of characters:

Adult *A. platynotus* have a generally unmarked dorsum, being light greyish to light brown in colour. There is a uniform sheen, generally lacking in etchings of scales, and few if any spots or speckles on the upper surface, although some specimens do have rows of scattered tiny grey spots running in lines down the dorsum.

The subspecies *A. platynotus diversus subsp. nov*. is similar in most respects to nominate *A. platynotus platynotus*, but differs from that taxon by having numerous tiny grey dots running in lines down the dorsum, as well as extensive grey specking on the tail, which is absent in *A. platynotus platynotus*.

A. katrinahoserae sp. nov. is readily separated from the other three species by having what in life appears to be a dark silvery grey dorsum, formed in large part by the presence of dark greyish-black etchings of the dorsal scales, not seen in any of the other species and giving it scales that look fish-like. In some relatively uncommon yellowish brown specimens, the fish-like scales remain because they in turn have black etching. The lower parts of the anterior upper labials are more-or-less barred or spotted with large amounts of blackish-brown, versus a minimal amount in *A. platynotus*, which are mainly whitish here. The lower part of the anterior upper labials are whitish in *A. donnellani* and whitish and heavily marbled brown in *A. woolfi sp. nov.*.

A. katrinahoserae sp. nov. is readily separated from all other species in the subgenus by having limbs that are mainly black in colour.

The head of *A. katrinahoserae sp. nov.* is brown with blackish marbling, versus light grey or light brown, with either no markings or just a few tiny flecks in both subspecies of *A. platynotus*.

Both *A. donnellani* and *A. paulwoolfi sp. nov.* are readily separated from the other two species in the subgenus by having two large reddish brown spots on the otherwise white or whitish posterior upper labials.

These spots are largest and most prominent in *A. donnellani.*

A. donellani is separated from *A. paulwoolfi sp. nov.* by having a dorsum that has scales with tiny black dots forming longitudinal lines down the back, whereas in *A. paulwoolfi sp. nov.*, the scales are dark grey etched to give a more fish-like appearance to the scales of the dorsum, but overall the dorsum is brownish in colour, versus silvery grey in *A. katrinahoserae sp. nov.*.

A. paulwoolfi sp. nov. is the only species in the group for which adults have a significant amount of black etching on the edges of the scales on the upper surface of head. The other species either have no markings or just scattered spots on the upper surfaces of the head.

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Other than perhaps dark or black spotting on each scale in each scale row running down the back in some specimens in the subgenus *Celerscincus subgen. nov.* there is no indication of pale striping running down the back.

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Dorsal colouration is usually greyish or brownish on the upper surface, with or without flecks or other markings, with dark below that light striping on the flanks of the body. Upper labials usually white or whitish.

Nominate *A. platynotus platynotus* in life are depicted in Hoser (1989) on page 103 top right and online at:
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A. platynotus diversus subsp. nov. are depicted in life online at:
https://www.inaturalist.org/observations/12482330
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https://www.inaturalist.org/observations/64720946
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A. katrinahoserae sp. nov. are depicted in life in Cogger (2014) on page 413 top left and online at:
https://www.inaturalist.org/observations/108005387
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A. donnellani are depicted in life online at:
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and
https://www.inaturalist.org/observations/39446066
and
https://www.flickr.com/photos/23031163@N03/15287880850/

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Dubey and Shine (2010) wrote of the lineages herein formally identified herein as new species:

"*Within* B. platynota*, the splits between the major lineages began in the Lower and Upper Pliocene (3.2 Myr, 95% HPD: 3.2–5.3; 4.3, 95% HPD 3.7–5.9; 4.4 Myr, 95% HPD: 4.1–5.9; 2.3 Myr, 95% HPD: 2.3–3.3*)."

Exceptional to the above is for the species *B. paulwoolfi* for which no genetic material was available to Dubey and Shine (2010), but which is separated from more southern populations by a biogeographic barrier of known antiquity in far northern New South Wales affecting similarly constrained reptile taxa, that occupy rocky habitats (see the three relevant species pair examples in Hoser 2016a, 2017 and 2018, split between the Granite belt of far southern Queensland and the New England region of New South Wales further south, generally south of Inverell and Glen Innes).

Distribution: *A. platynotus diversus subsp. nov.* is known only from Kanangra Boyd National Park, to the west of the Upper Blue Mountains, west of Sydney and Morton National Park, south of Sydney and inland from Nowra, but presumably occurs in rocky upland locations between these two sites.

Etymology: *A. platynotus diversus subsp. nov.* is named in reflection of its divergence from the nominate form of the species. In Latin, *diversus* means diverged.

CONCLUSION

This and other recent papers including some cited herein, have underscored previously underestimated species diversity in well-known and common species. While the species formally named within this paper are not believed to be under any existential threats at present, things can change rapidly if and when new pathogens or pests enter the ecosystem, as seen for example with frogs as detailed in Hoser (1991).

Formal recognition of unnamed species is an important first step to their conservation and management and it is important that valid species should only be named once and not subjected to unwarranted taxonomic vandalism as being practiced by the

Wolfgang Wüster gang (Hoser 2007, 2009, 2012a, 2012b, 2013, 2015a-f, 2019a-b).

The ICZN formally rejected their applications to overwrite names of myself (Hoser) and others (ICZN 2021), that had in turn followed similar ICZN rulings of 1991 and 2001 relevant to the works of Wells and Wellington.

In 2021 the ICZN stated that all names of Hoser were valid and available, without need to formally make a plenary ruling to effect what was already in effect and obvious.

The Plenary power is to be used to rectify things outside the *International Code of Zoological Nomenclature* and not to affect what is self-evidently compliant within it.

Following on from the ICZN ruling of 2021, the scourge of the Wolfgang Wüster's gang's actions should now be removed from the biological sciences (Hawkeswood 2021).

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CONFLICT OF INTEREST

None.

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A new species of *Notopseudonaja* Wells, 2002 (Squamata: Serpentes: Elapidae).

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ABSTRACT

The Australian Ringed Brown Snake, found in most drier parts of mainland Australia has until recently been treated by most Australian herpetologists as a single species, *Pseudonaja modesta* (Günther, 1872), *sensu* Cogger (2014).

Contrary to this position was Wells (2002), who erected a new genus *Notopseudonaja*, for the taxon originally named *Cacophis modesta* Günther, 1872, with a type locality of near Perth in Western Australia.

Wells (2002) furthermore resurrected the previously synonymised species *Furina ramsayi* Macleay, 1885, from the Barrier Ranges in west New South Wales as well as *Brachysoma sutherlandi* De Vis, 1884 from Carl Creek, Norman River in north-west Queensland.

Hoser (2013) adopted the Wells (2002) taxonomy and formally named the Kimberley form as *N. wellsi.*
A molecular and morphological study by Gregory in 2010 as part of his PhD wholly supported the taxonomy and nomenclature of Wells (2002) and hence the use of that taxonomy within this paper.

Gregory (2010) did also by implication cast doubt on the validity of the later named *N. wellsi*, implying it may be a junior synonym of *N. sutherlandi*, based on the number of rings on the body.

In any event, Gregory (2010) did identify an unnamed species found across most of South Australia and nearby parts of Queensland, the Northern Territory and Western Australia.

No one has sought to name that taxon in the intervening 12 years.

Hence that taxon is formally named herein as *N. rosswellingtoni sp. nov.*.

Keywords: Taxonomy; nomenclature; Australia; Snake; Elapidae; *Notopseudonaja*; *Pseudonaja*; *modesta*; *sutherlandi*; *ramsayi*; *wellsi*; new species *rosswellingtoni.*

INTRODUCTION

The Australian Ringed Brown Snake, from most parts of mainland Australia has until recently been treated by most Australian herpetologists as a single species, *Pseudonaja modesta* (Günther, 1872), *sensu* Cogger (2014).

Contrary to this position was Wells (2002), who erected a new genus *Notopseudonaja*, for the taxon originally named *Cacophis modesta* Günther, 1872, with a type locality of near Perth in Western Australia.

The basis of the division of the genus *Pseudonaja* Günther, 1858 was a divergent morphology and ecology for this putative species.

Wells (2002) furthermore resurrected the previously synonymised species *Furina ramsayi* Macleay, 1885, from the Barrier Ranges in west New South Wales as well as *Brachysoma sutherlandi* De Vis, 1884 from Carl Creek, Norman River in north-west Queensland.

Hoser (2013) adopted the Wells (2002) taxonomy as logical and correct and formally named the Kimberley form as *N. wellsi.* That taxon was separated from others in the genus by its greater number of body bands, with Hoser (2013) of the belief that the form was restricted to the Kimberley District of Western Australia.

As part of the formal description, Hoser (2013) wrote: ""*Known only from the Kimberley region of Western Australia*."
A molecular and morphological study by Gregory in 2010 as part of his PhD wholly supported the taxonomy and nomenclature of Wells (2002) and hence the use of that taxonomy within this paper.

Gregory (2010) did also in effect by implication, cast doubt on the validity of the later named *N. wellsi*, implying it may be a junior synonym of *N. sutherlandi*, based on the number of rings on the body, with Gregory finding putative specimens of this

form across the tropical north of Australia.

If *N. sutherlandi* and *N. wellsi* are conspecific, then the earlier name *N. sutherlandi* takes priority and *N. wellsi* becomes a subjective junior synonym.

As part of his study, Gregory (2010) did identify an unnamed species found across most of South Australia and nearby parts of Queensland, the Northern Territory and Western Australia.

There was doubt as to the exact identity of "*Furina ramsayi* Macleay, 1885" in that it was not certain whether or not it was of the east Australian clade or the South Australian / Centralian one.

However inspection of live specimens from the Barrier Ranges in New South Wales, including the two locations given as the type locality for "*Furina ramsayi*" (Silverton and Milparinka) and also inspection of the holotype for the putative taxon, has confirmed that the relevant snakes are of the east Australian clade.

Therefore the (mainly) South Australian / Central Australian form remains without an available name.

I note also that in the 12 years since Gregory published his relevant PhD, no herpetologist has sought to name the obviously unnamed taxon, which in terms of herpetology and science is untenable.

Therefore that taxon is formally named herein as *N. rosswellingtoni sp. nov.*.

MATERIALS, METHODS AND RESULTS

These are outlined in the introduction and are summarised as follows.

Inspection of live and dead specimens from the across the putative range of *N. modesta* was carried out over a period spanning more than a decade, including the holdings at various State museums. Viewing of numerous photos of live specimens with good locality data was also conducted and found to be of great utility.

A sweep of the key references in terms of the putative species *N. modesta* was done to confirm the taxonomy and nomenclature current and that also available in terms of names for given populations.

Key references in terms of putative *N. modesta* that were consulted were Bush (1981), Bush and Maryan (2006), Cogger (2014), Cogger *et al.* (1983), De Vis (1884, 1889), Dittmer *et al.* (2020), Fry (1914), Gillam (1979), Gregory (2010), Günther (1858, 1872), Hoser (2009, 2012, 2013), Macleay (1885), Ride *et al.* (1999), Skinner (2009), Skinner *et al.* (2005), Sternfeld (1925), Swan *et al.* (2009, 2017), Wallach *et al.* (2014), Wells (2002), Wells and Wellington (1984, 1985), Wilson and Swan (2010, 2017) and sources cited therein.

Specimens of putative *N. modesta* from Silverton and Milparinka in western New South Wales, were inspected and conformed with the eastern form of the taxon as identified by Gregory (2010).

Within his PhD paper, Gregory (2010) stated that in an analysis, the type for "*Furina ramsayi* Macleay, 1885" was in some ways closer to the South Australian / Centralian form than the eastern form for certain traits, but my viewing of the relevant material found the reverse to be the case and the relevant traits investigated by Gregory being highly variable in both taxa.

Both species do overlap in many characters and are morphologically very similar.

A photo of the holotype was inspected by myself and blown up for close examination.

The feature of the holotype that made it clear "*Furina ramsayi* Macleay, 1885" was of the eastern form and not the South Australian / Centralian form was the condition of the black body bands having obviously jagged anterior or posterior edges, a trait typical of the eastern form.

South Australian / Centralian ones (defined here as being mainly in South Australia), have borders on the bands that are generally even and not jagged.

In terms of distribution Australia-wide, the various clades do have certain features in areas the ranges abut or overlap.

The newly named form, *N. rosswellingtoni sp. nov.* seems to dominate in sandy and flat areas.

By contrast, the type form of *N. modesta* with a centre of distribution in the western two thirds of Western Australia dominates in hilly and elevated shield areas, such as the Pilbara and Gascoyne regions of Western Australia.

A good example of the relative dominance of each form is seen in the Pilbara where *N. modesta* dominates, but along the Fortescue River barrier *N. rosswellingtoni sp. nov.* makes an appearance.

Conversely in the eastern third of Australia, *N. ramsayi* dominates in hilly and near hilly areas, including self-evidently in the Barrier Range.

N. sutherlandi / *N. wellsi* dominate in the hilly areas of the tropics but makes no major incursions south to the more hyper-arid areas.

Queensland *N. sutherlandi* appear to be separated from *N. wellsi* and similar patterned snakes in the Northern Territory by the Barkly Tableland which has either *N. modesta*, *N. ramsayi* or both.

This fact implies that *N. sutherlandi* (with 11 body bands) from western Queensland and *N. wellsi* (with 9-12 body bands) from the Kimberley in Western Australia are sufficiently divergent to be treated as two separate species or subspecies, although the molecular results of Gregory (2010) do not support that contention.

It appears that in the recent geological past, populations of putative *N. modesta* have contracted in range, at which time speciation has occurred and then when re-expansion of populations has occurred, the various newly formed taxa have as a rule excluded one another from areas inhabited already.

Where ranges abut, character displacement appears to have occurred with either form occupying a habitat type they appear to have a relative advantage in.

As already mentioned the South Australian / Centralian form is sufficiently divergent from the other already named forms to warrant being treated as a separate species, especially with regards to a lack of evidence of cross-breeding with other populations.

Therefore it is formally named as a new species below.

NOTOPSEUDONAJA ROSSWELLINGTONI SP. NOV.

LSIDurn:lsid:zoobank.org:act:378290AB-FA8A-4766-B24A-F34659CAD962

Holotype: A preserved specimen at the South Australian Museum, Adelaide, South Australia, Australia, specimen number R68019, collected from 4.45 km north north-west of Tarcoola, South Australia, Australia, Latitude -30.6911 S., Longitude 134.5222 E. This government-owned facility allows access to its holdings.

Paratypes: 1/ A preserved specimen at the South Australian Museum, Adelaide, South Australia, Australia, specimen number R13966 collected from the south-east corner of Lake Everard, South Australia, Australia, Latitude -31.63 S., Longitude 135.43 E. 2/ A preserved specimen at the South Australian Museum, Adelaide, South Australia, Australia, specimen number R14357 collected from Glenloth Goldfields, 32 km south west of Kingoonya, South Australia, Australia, Latitude -31.08 S., Longitude 135.10 E.

Diagnosis: Until now, *Notopseudonaja rosswellingtoni sp. nov.* has been treated as a South Australian / Centralian population of *N. modesta* (Günther, 1872), type locality west, Western Australia, placed by most recent authors, including Cogger (2014) in the genus *Pseudonaja* Günther, 1858, rather than *Notopseudonaja* Wells, 2002.

N. rosswellingtoni sp. nov. is readily separated from both *N.*

sutherlandi (De Vis, 1884), (with 11 body bands) with a holotype from north-western Queensland and *N. wellsi* (Hoser, 2013), type locality north Kimberley district, Western Australia (with 9-12 body bands) by having 5-8 body bands, with *N. sutherlandi* and *N. wellsi* possibly being conspecific, as both those putative taxa occur in northern Australia, although populations of each are apparently split from one another in the east of the Northern Territory.

N. rosswellingtoni sp. nov. with a centre of distribution in the State of South Australia and including nearby parts of south-west Queensland, southern Northern Territory and eastern Western Australia, extending west towards the coast along some major river valleys, *N. modesta* found mainly in western Western Australia and *N. ramsayi* (Macleay, 1885), with a distribution centred on the Murray Darling and Cooper's Creek basins as well as the Barrier Range (NSW) all have 8 or less body bands.

N. rosswellingtoni sp. nov. is however separated from *N. modesta* and *N. ramsayi* by having a fore-nasal height divided by head length to end of skull that is greater than 0.0875, versus less than or equal to 0.0875 in *N. modesta* and *N. ramsayi.*

N. rosswellingtoni sp. nov. is further separated from both *N. ramsayi* and *N. modesta* by having body bands that are not jagged edged either anteriorly or posteriorly, and furthermore is separated from *N. ramsayi* by having a relatively narrow pale interspace between the black patch centred on the head between the eyes and the second black patch behind the head (at the top median line). In *N. ramsayi* the pale interspace (at the top median line) is nearly as wide as the black bar behind it, versus far from it in *N. rosswellingtoni sp. nov*. (and *N. modesta*).

While colouration of specimens varies, *N. rosswellingtoni sp. nov*. tends to be orangeish in colour, versus more a salmon colour in *N. ramsayi. N. modesta* is separated from the two preceding species by having a strong yellowish or brown hue on the dorsum.

N. sutherlandi and *N. wellsi* are both (further) separated from the other species in the genus by having a pale interspace between the black on the front of the head and at the nape that is posterior, that is as wide or wider than the black mark behind it (at the top medial line), versus not so in the other species.

Notopseudonaja Wells, 2002 are separated from morphologically similar species in the genus *Pseudonaja* Günther, 1858 by having a combination of 17 mid-body scale rows and less than 175 ventrals, versus more than this number in all species of *Pseudonaja.*

The morphologically similar genus *Placidaserpens* Wells, 2002, comprising two known species (*sensu* Gregory 2010), being *P. guttata* (Parker, 1926) and *P. whybrowi* (Hoser, 2009), is in turn separated from both *Notopseudonaja* Wells, 2002 and *Pseudonaja* Günther, 1858 by having 21 mid-body scale rows, versus 17 or 19 in the other two genera.

The genus *Oxyuranus* Kinghorn, 1923 being the most closely related other genus to *Notopseudonaja* based on the molecular evidence published by Gregory (2010) is readily separated from *Notopseudonaja*, *Placidaserpens* and *Pseudonaja* by the unique combination of a single anal plate (versus double in the other species), 21 or more mid-body scale rows, a distinctively rectangular head, thin neck, with obviously raised (keeled) scales on the dorsal surface of the neck, enlargement of the sheath covering the fangs and slight enlargement of the posterior body, in contrast to the relatively even body shape of the other species.

The genera *Placidaserpens* Wells, 2002 and *Notopseudonaja* Wells, 2002 are both supported by the genetic evidence of Gregory (2010) as being distinct from *Pseudonaja.* However at the present time, most publishing Australian herpetologists, including Cogger (2014), pretend that this is not the case and continue to synonymise both within *Pseudonaja.*

The holotype of *N. modesta* is depicted on page 19 of Gregory (2010).

The type form of *N. modesta* in life is depicted in Wilson and Knowles (1988) on page 342 at top left, Cogger (2014) at page 927 top right and online at: https://www.flickr.com/photos/194274402@N06/51648693568/

The holotype of *N. ramsayi* is depicted on page 20 of Gregory (2010).

N. ramsayi in life is depicted in Wilson and Swan (2017) on page 585 at top, Swan *et al.* (2009) on page 255 and online at: https://www.flickr.com/photos/gazs_pics/44965089034/

The holotype of *N. sutherlandi* is depicted on page 19 of Gregory (2010).

N. wellsi in life is depicted online at: https://www.inaturalist.org/observations/9901577

N. rosswellingtoni sp. nov. is depicted in life online at: https://www.flickr.com/photos/jaricornelis/40476007993/

Distribution: *N. rosswellingtoni sp. nov*. has a centre of distribution in the State of South Australia and including nearby parts of south-west Queensland, southern Northern Territory and eastern Western Australia, extending west towards the coast along some major river valleys.

Conservation: No species in the genus *Notopseudonaja* Wells, 2002 is of immediate conservation concern or known threats, notwithstanding the relevant comments of Hoser (1989, 1991, 1993, 19966, 2019a, 2019b).

Etymology: The new species *N. rosswellingtoni sp. nov*. is named in honour of Cliff Ross Wellington of Ramornie, northern New South Wales, Australia in recognition of his many contributions to Australian herpetology, that go well beyond two publications he is a well-known co-author of, namely Wells and Wellington (1984 and 1985).

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CONFLICTS OF INTEREST - NONE.

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New species of freshwater Crocodile from Northern Australia.

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Received 4 June 2021, Accepted 15 June 2021, Published 15 May 2022.

ABSTRACT

An ongoing audit into the taxonomy and nomenclature of Australasian herpetofauna revealed unnamed species of Crocodile from Northern Australia.

These are formally identified and named for the first time in accordance with the rules of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999 as amended online since).

All are morphologically divergent from their nearest relatives and based on known geological prehistory, have been divergent for an extended period of time, warranting full species-level recognition.

Two distinctive freshwater crocodiles from the Kimberley district of Western Australia, previously confused with *Crocodylus* (*Oopholis*) *johnstoni* Krefft, 1873 or *Crocodylus* (*Oopholis*) *webbi* Wells and Wellington, 1985 are also formally named for the first time.

Keywords: taxonomy; nomenclature; Australia; Crocodile; *Crocodylus*; *Oopholis*; *johnstoni*; *webbi*; *oxyi*; *jackyhoserae*; *adelynhoserae*; new species; *shireenae*; *lowingae*.

INTRODUCTION

A study by this author of Freshwater Crocodiles spanning more than 40 years, including travels across all mainland Australian states, inspection of thousands of living and dead specimens, photos of specimens from most major river systems and an audit of available literature and photos has shown there to be an underestimated diversity of species in northern Australia.

With these self-evident facts, the present assignment sought to identify divergent forms based on morphology and distribution and to establish their species boundaries with respect to other similar species.

MATERIALS AND METHODS

An assessment was done of Freshwater Crocodiles across Northern Australia at the same time one was done on northern Australian Freshwater Turtles (or Terrapins), the results of which were eventually incorporated into Hoser (2021).

As far back as 1983, I had noted the different morphology of Freshwater Crocodiles in Geikie Gorge (now Danggu Gorge), in the Kimberley district of north-west Western Australia, as compared to those from the Northern Territory and North-east Queensland, noting that those two forms are also very different and now recognized as separate species.

Other than the papers of Wells and Wellington (1985) and Hoser (2012 and 2018), very little has been published with respect of the taxonomy of freshwater crocodiles in Australia in the last 50 years.

A Synonyms list for Australian Crocodiles to 1983 was published by Cogger *et al.* (1983).

Newly named taxa from the Australian region have been identified by Wells and Wellington (1985), *Crocodylus* (*Oopholis*) *webbi*, Hoser (2012), *C. jackyhoserae* and *C. adelynhoserae* and Hoser (2018), *C. oxyi* . I note that the genus name *Oopholis* was first proposed by Gray in 1862.

It was not proposed by myself as alleged by Wolfgang Wuster, Mark O'Shea, Wulf Schleip and Hinrich Kaiser on their "peer reviewed" forum known as "Facebook".

Literature relevant to the taxonomy and nomenclature of Australian crocodiles and the taxonomic decisions herein with respect of Crocodiles in Australia is cited within Cogger *et al.* (1983), Wells and Wellington (1985) and Hoser (2007, 2012 and 2018).

Those preceding named crocodile taxa and the scientific findings of the papers of Wells, Wellington and Hoser were formally validated by Hawkeswood (2021).

The availability of the scientific names proposed by Hoser in 2012 and 2018 was confirmed by the International Commission on Zoological Nomenclature in 2021 in their formal "Opinion 2468" (International Commission on Zoological Nomenclature 2021. Opinion 2468).

The inspection of Australian crocodiles included viewing of live and dead specimens from all parts of the known range within Australia, in the wild, in captivity, in museums and by way of viewing photos of specimens of various size and age with good locality data.

Comparative specimens of freshwater crocodile from most parts of New Guinea, including on the Indonesian side were also

inspected and I should mention here that they were deemed not to be conspecific with any Australian forms on the basis of morphological divergence and significant differences in breeding biology.

RESULTS

In summary, the Australian Freshwater Crocodile, herein placed in *Oopholis* Gray, 1844, treated herein as a subgenus of *Crocodylus*, from the Kimberley district of Western Australia were found to be divergent morphologically from congeners in the Victoria River system in the Northern Territory and east of there.

The two forms formally named below also broadly matched the drainage systems as they were at the ice-age maxima as outlined by Shelley *et al.* (2020).

The Freshwater Crocodiles from the extensive Fitzroy River System were also very divergent from those of the Northern Territory and Queensland and also appear to have been divergent for a time sufficient to have become specifically distinct.

Those from the Prince Regent River and Mitchell River systems of the north-west Kimberley are also divergent and have therefore also been named as a separate taxon, which more-or-less reflects recently identified and divergent taxa of turtles as per Hoser (2021).

Prince Regent River and Mitchell River system freshwater crocodiles also differ slightly from one another, but are herein treated as two forms of the same species.

Because of ongoing environmental pressures in the relevant region, including introduced pests and a push for increased agriculture and irrigation affecting the relevant drainage systems, the relevant species may come under existential threat in the coming century. Therefore I have no hesitation in formally naming the relevant taxa for the first time.

INFORMATION RELEVANT TO THE FORMAL DESCRIPTIONS THAT FOLLOW

There is no conflict of interest in terms of this paper or the conclusions arrived at herein.

Several people including anonymous peer reviewers who revised the manuscript prior to publication are also thanked as are relevant staff at museums who made specimens and records available in line with international obligations.

In terms of the following formal descriptions, spellings should not be altered in any way for any purpose unless expressly and exclusively called for by the rules governing Zoological Nomenclature as administered by the International Commission of Zoological Nomenclature (ICZN).

In the unlikely event two or more newly named taxa are deemed to be the same by a first reviser, then the name to be used and retained is that which first appears in this paper by way of page priority and as listed in the abstract keywords.

Some material in descriptions for taxa may be repeated for other taxa in this paper and this is necessary to ensure each fully complies with the provisions of the *International Code of Zoological Nomenclature* (Fourth edition) (Ride *et al.* 1999) as amended online since.

Material downloaded from the internet and cited anywhere in this paper was downloaded and checked most recently as of 4 June 2021 (including if also viewed prior), unless otherwise stated and was accurate in terms of the content cited herein as of that date.

Unless otherwise stated explicitly, colour and other descriptions apply to living adult specimens of generally good health and not under any form of stress by means such as excessive cool, heat, dehydration, excessive ageing, abnormal skin or reaction to chemical or other input.

While numerous texts and references were consulted prior to publication of this paper, the criteria used to separate the relevant species or subspecies has already been spelt out and/or is done so within each formal description and does not rely on material within publications not explicitly cited herein.

CROCODYLUS* (*OOPHOLIS*) *SHIREENAE SP. NOV.

LSIDurn:lsid:zoobank.org:act:6625F2B0-61A6-438B-8051-DF0F3A939100

Holotype: A preserved specimen at the Western Australian Museum, Perth, Western Australia, Australia, specimen number R14919, collected from the Fitzroy River, Western Australia, Australia, Latitude -18.2 S., Longitude 125.6 E. This government-owned facility allows access to its holdings.

Paratype: A preserved specimen at the Western Australian Museum, Perth, Western Australia, Australia, specimen number R91039, collected from the Isdell River, Western Australia, Australia, Latitude -17.1 S., Longitude 125.7 E.

Diagnosis: Adult *Crocodylus shireenae sp. nov.* from the Fitzroy River and adjacent river systems in the southern and south-west Kimberley district of Western Australia and adult *C. lowingae sp. nov.* from the Prince Regent and Mitchell River systems in the west Kimberley are separated from other Australian Freshwater Crocodiles by having a dorsum characterised by three (rarely four) broad and well defined blackish cross-bands, being thick on the midline of the dorsum and getting thinner on the flanks, ending on the mid to lower flanks.

The snout is elongate like in the Northern Territory species, but unlike those species, both *C. shireenae sp. nov.* and *C. lowingae sp. nov.* have a snout that is noticeably concave inwards at the posterior end before the nasal bulge.

Northern Territory and East Kimberley species of Freshwater Crocodile have thin dark bands across the mid dorsum, as opposed to the broad dark areas seen in both *C. shireenae sp. nov.* and *C. lowingae sp. nov..*

C. johnstoni from the east coast drainages of north Queensland are characterised by a relatively short and wide snout and a roof of the mouth that is flattish rather than slightly concave as seen in the species found west of Cape York in northern Australia. Darker markings on the dorsum of *C. johnstoni* are relatively indistinct and banding is not obvious as usually seen in the other species.

C. lowingae sp. nov. is separated from *C. shireenae sp. nov.* by an increased amount of black speckling or pigment on the snout and on the upper surfaces of the limbs.

Saltwater Crocodiles, *C. porosus* Schneider, 1801 are readily separated from the Freshwater species by a short blunt snout; in adults the distance from the snout to a point midway between the eyes is less than twice the width of the head at the level of the eyes; enlarged nuchal shields in two rows (versus one in the Freshwater species), separated from the smooth-skinned parietal region by more than eight granular scales.

Adult specimens of *C. shireenae sp. nov.* from near Derby in Western Australia are depicted in colour images online at:
https://www.inaturalist.org/observations/110549966
and
https://www.inaturalist.org/observations/51201164
and
https://www.inaturalist.org/observations/92732779

Distribution: *C. shireenae sp. nov.* occurs in the Fitzroy River and adjacent river systems in the southern and south-west Kimberley district of Western Australia.

Etymology: Named in honour of my wife, Shireen Hoser, of Park Orchards, Melbourne, Victoria, Australia, in recognition of her many contributions to wildlife conservation over some decades.

CROCODYLUS* (*OOPHOLIS*) *LOWINGAE SP. NOV.

LSIDurn:lsid:zoobank.org:act:D7472FCD-8FA0-47DB-B90F-5611C8AD3476

Holotype: A preserved specimen at the Western Australian Museum, Perth, Western Australia, Australia, specimen number R47047 collected from the Prince Regent National Park, Latitude -15.6 S., Longitude 125.3 E. This government-owned facility allows access to its holdings.

Paratype: A preserved specimen at the Western Australian Museum, Perth, Western Australia, Australia, specimen number R47040 collected from the Prince Regent National Park, Latitude -15.4 S., Longitude 125.6 E.

Diagnosis: Adult *Crocodylus shireenae sp. nov*. from the Fitzroy River and adjacent river systems in the southern and south-west Kimberley district of Western Australia and adult *C. lowingae sp. nov.* from the Prince Regent and Mitchell River systems in the west and north-west Kimberley are separated from other Australian Freshwater Crocodiles by having a dorsum characterised by three broad and well defined blackish cross-bands, being thick on the midline of the dorsum and getting thinner on the flanks, ending on the mid to lower flanks.

The snout is elongate like in the Northern Territory species, but unlike those species, both *C. shireenae sp. nov*. and *C. lowingae sp. nov*. have a snout that is noticeably concave inwards at the posterior end before the nasal bulge.

Northern Territory and East Kimberley species of Freshwater Crocodile have thin dark bands across the mid dorsum, as opposed to the broad dark areas seen in both *C. shireenae sp. nov*. and *C. lowingae sp. nov.*.

C. johnstoni from the east coast drainages of north Queensland are characterised by a relatively short snout and a roof of the mouth that is flattish rather than slightly concave as seen in the species found west of Cape York in northern Australia. Darker markings on the dorsum of *C. johnstoni* are relatively indistinct and banding is not obvious as usually seen in the other species.

C. lowingae sp. nov. is separated from *C. shireenae sp. nov*. by an increased amount of black speckling or pigment on the snout and upper surfaces of the limbs, and typically (but not always) with less distinct dorsal cross-bands in adults.

Saltwater Crocodiles, *C. porosus* Schneider, 1801 are readily separated from the Freshwater species by a short blunt snout; in adults the distance from the snout to a point midway between the eyes is less than twice the width of the head at the level of the eyes; enlarged nuchal shields in two rows (versus one in the Freshwater species), separated from the smooth-skinned parietal region by more than eight granular scales.

Distribution: *C. lowingae sp. nov*. occurs in the Prince Regent and Mitchell River systems in the north west Kimberley district of Western Australia.

Etymology: Named in honour of Vicki Lowing, also known as the Crocodile Lady, of Rockbank, Victoria in recognition of her services to crocodile conservation in Australia.
For more details about Vicki Lowing, see the etymology for *Lowingdella* Hoser, 2020 at page 73 of Hoser (2020).

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CONFLICT OF INTEREST

None.

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Daraninanura brevipalmata daranini subsp. nov. and *Daraninanura brevipalmata andypadgetti subsp. nov.*, two new frogs from Eastern Australia.

LSIDURN:LSID:ZOOBANK.ORG:PUB:7F18023F-C870-4973-ACA2-445F409DB7C0

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Received 4 August 2021, Accepted 28 September 2021, Published 15 May 2022.

ABSTRACT

Until now the species *Litoria brevipalmata* Tyler, Martin and Watson, 1972, more recently placed into the genus *Daraninanura* Hoser, 2020 has been treated as a single biological entity.

No author has until now countenanced the possibility that more than one diagnosable taxon existed.

Inspection of specimens across the known range from the NSW Central Coast to South-east Queensland, revealed significant regional divergence.

The two northern forms are herein formally described as new subspecies.

Keywords: Frog; Queensland; New South Wales; Australia; tree frog; *Litoria*; *Daraninanura*; *brevipalmata*; new subspecies; *daranini*; *andypadgetti* .

INTRODUCTION

In 2020, I published a three volume monograph on the Australasian Tree Frogs including formal descriptions of 12 tribes, 11 subtribes, 34 genera, 26 subgenera, 62 species and 12 subspecies new to science (Hoser, 2020). The species originally described as *Litoria brevipalmata* Tyler, Martin and Watson, 1972 was formally placed in a newly erected monotypic genus *Daraninanura* Hoser, 2020 based on significant morphological and genetic divergence from all other species as outlined by Hoser (2020) including a 35.1 MYA estimated divergence from nearest living relatives.

Placement of the putative taxon into the genus *Nyctimystes* Stejneger, 1916 by various authors, including as seen at https://en.wikipedia.org/wiki/Nyctimystes is in error and reflects the stupidity of the relevant authors.

Nyctimystes Stejneger, 1916, type species *Nyctimantis papua* Boulenger, 1897 is not remotely rated to *Daraninanura* Hoser, 2020 at the species level, having diverged an estimated 40 MYA prior, based on the phylogenies cited by Hoser (2020).

At the time of publication of Hoser (2020), I was aware of significant regional variation in specimens of the single putative species within the genus. However, in the first instance, the variation did not appear to be strongly correlated with known biogeographical barriers, or extant distributional gaps and so I deferred any taxonomic actions pending further examination of specimens.

Notwithstanding significant challenges over the following year, I was able to inspect several hundred specimens and photos of specimens from across the known range of the putative species to the extent that there appears to be at least two other populations that are readily identifiable and separable from the nominate form with ease allowing them to be given formal taxonomic recognition.

MATERIALS AND METHODS

Relevant published literature as cited by Hoser (2020) as well as Anstis (2013), Aridis (1996), Barker *et al.* (1995), Cavanaugh (1996), Cogger (2014), Czechura (1978), Duellman *et al.* (2016), Eipper and Rowland (2018), Lemckert *et al.* (2006), McDonald (1974), Murphy and Turbill (1999), Natrass and Ingram (1993), Power (2017), Tyler, Martin and Watson (1972), Vanderduys (2012) and Wells and Wellington (1985) and sources cited therein were reviewed as were several hundred specimens and photos of specimens from across the known range of the putative species, those specimens being inspected as best as possible within the constraints of state of preservation, stage of life or quality of images on hand.

Consistent diagnosable differences were noted between populations with a view to separation of these on the basis of these differences and known gaps in distribution.

Any clearly divergent populations were to be targeted for formal taxonomic recognition.

RESULTS

Specimens clustered into three main groups, being those from south of the Hunter Valley, those north of there to south-east Queensland, generally in the vicinity of the border ranges and those from north of there to the Sunshine Coast area in south-east Queensland.

Morphologically at least, those populations were readily separable and based on apparently disjunct distributions are herein taxonomically recognized as subspecies.

However it is noted that the presumed and stated boundaries for

each taxon herein may not be exact.
It is likely each taxon in fact represents separate species instead, but the conservative treatment herein (as subspecies) reflects the fact that there is no molecular data in support of the latter contention.

The only population previously named is the southern one with a type locality of 5 miles north-west of Gosford, New South Wales, Australia.

The other two are formally named as new subspecies.

In terms of the following descriptions the following should be noted.

There is no conflict of interest in terms of this paper or the conclusions arrived at herein.

Several people including anonymous peer reviewers who revised the manuscript prior to publication are also thanked as are relevant staff at museums who made specimens and records available in line with international obligations.

In terms of the following formal descriptions, spellings should not be altered in any way for any

purpose unless expressly and exclusively called for by the rules governing Zoological Nomenclature as administered by the International Commission of Zoological Nomenclature.

In the unlikely event the two newly named subspecies are deemed to be the same by a first reviser, then the name to be used and retained is that which first appears in this paper by way of page priority and as listed in the abstract keywords.

Material in each of the formal descriptions is repeated and this is necessary to ensure each fully complies with the provisions of the *International Code of Zoological Nomenclature* (Fourth edition) (Ride *et al.* 1999) as amended online since.

Each description effectively separates and diagnoses each of the three subspecies as defined herein, both from one another and as a group from all other Australian tree frogs.

Material downloaded from the internet and cited anywhere in this paper was downloaded and checked most recently as of 4 August 2021, unless otherwise stated and were accurate in terms of the context cited herein as of that date.

Unless otherwise stated explicitly, colour descriptions for frogs apply to living adult specimens of generally good health, as seen in normal daytime conditions and not under any form of stress by means such as excessive cool, heat, dehydration or abnormal skin reaction to chemical, extreme ageing or other input.

A general reference to “colour” is unless otherwise stated, referring to the dorsal and obvious colouration of the frog on the usually visible upper surfaces.

Unless otherwise stated, the following applies. Size measurements and ratios quoted herein are for normal adults of normal adult size. Where one number only is given, this is the average measurement. Where two numbers are given in the form of a range, this means “known range” based on previously measured and recorded specimens.

Delays in recognition of these unique taxa could jeopardise the long-term survival of these taxa as

outlined by Hoser (2019a, 2019b) and sources cited therein.

DARANINANURA BREVIPALMATA DARANINI SP. NOV.

LSIDurn:lsid:zoobank.org:act:E7524B50-8D75-41B3-8EE5-ABBD888F5B16

Holotype: A preserved specimen in the Queensland Museum in Brisbane, Queensland, Australia, specimen number J66065 collected 1km along Bellthorpe-Sunday Creek Road in the Conondale Range, Queensland, Australia, Latitude -26.758333 S., Longitude 152.625 E. This government-owned facility allows access to its holdings.

Paratypes: 1/ A preserved specimen in the Queensland Museum in Brisbane, Queensland, Australia, specimen number J66103 collected on the Jimna-Bellthorpe Road, 2km from Sunday Creek Turnoff, in the Conondale Range, Queensland, Australia, Latitude -26.725 S., Longitude 152.491667 E.

2/ Two preserved specimens at the Queensland Museum in Brisbane, Queensland, Australia, specimen numbers J71305 and J71306 both collected from the Hell Hole Logging Area, Squirrel Creek State Forest, in the Conondale Range, Queensland, Australia, Latitude -26.708333 S., Longitude 152.341667 E.

Diagnosis: The genus *Daraninanura* Hoser, 2020 monotypic for the type species *D. brevipalmata* (Tyler, Martin and Watson, 1972) is readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: Rich brown to chocolate brown or reddish brown above, occasionally with scattered small black flecks or similar such markings, usually being semi-distinct or indistinct. There is a wide canthal stripe running from snout to eye, continuing past the eye as a wide black band, almost over-writing the standard (for frogs) sized tympanum, continuing to the flank and sometimes bordered above with white or yellow. The upper lip has a narrow white or yellow stripe, narrowly edged below with brown, which continues as a glandular stripe from the angle of the mouth to the base of the forearm. The lower flanks are yellowish to whitish with scattered black spots, flecks or peppering. Groin is green or blue green. There are no red or orange spots on the hind side of the thighs. There is a dark stripe along the front edge of the hindlimb. Venter is white to light yellow. Top of iris is silver to gold in colour.

Skin is smooth to slightly leathery above and coarsely granular below. There are small and widely scattered tubercles on the upper flanks, being largest and most numerous at about the middle of the dorsum. Snout is rounded in shape. Vomerine teeth are prominent between the choanae. There is no pectoral fold. Finger and toe discs are of medium size, fingers are unwebbed and toes about one third webbed.

There is a prominent inner metatarsal tubercle and an indistinct small outer tubercle. The second finger is longer than the first, the first finger being so short that when pressed together with the second, it reaches no further than the base of the disc of the second.

It is not widely known that adults of this species are sexually dimorphic.

Males are characterised by a strong yellowish colour of lighter areas of the upper surfaces, in particular the upper labial and throat regions, versus generally white or whitish in females.

Adults of the three subspecies are readily separated from one another as follows:

Nominate *Daraninanura brevipalmata brevipalmata* has mint green to turquoise in the concealed and semi-concealed regions of the limbs and adjacent body. The dorsum of females is greyish brown, sometimes with a slight reddish tinge. In both sexes there are semi-prominent dark grey flecks across the dorsal surface and ten or more scattered black spots of irregular shape on each of the rear lower flanks. The wide canthal stripe running from snout to eye has an indistinct lower boundary.

Tubercles on the upper flanks do not come near the tympanum.

Nominate *D. brevipalmata brevipalmata* of both sexes are depicted in life in Cogger (2014) on page 153. Anstis (2013) also shows images of this taxon at various life-cycle stages.

A male of the subspecies is also depicted in life online at:
https://www.flickr.com/photos/14807473@N08/3558431834/
and females at:

https://www.flickr.com/photos/thelizardlab/50813283642/
and

https://www.inaturalist.org/observations/73373295

Daraninanura brevipalmata andypadgetti subsp. nov. has mint green to turquoise in the concealed and semi-concealed regions of the limbs and body. The wide canthal stripe running from snout to eye has a distinct lower boundary and is significantly narrower than seen in the other two subspecies, with there being a distinctive wide light brown strip or region between the canthal

stripe and the whitish or yellowish upper labial area.

Tubercles on the upper flanks do not come near the tympanum.

The dorsum of both sexes lacks mottling or obvious pigment, instead being generally greyish chocolate brown or chocolate brown in females and yellowish-brown in males.

In the groin area of either side are about 5 black spots of irregular shape and size, being generally medium in size and distinct.

Female *D. brevipalmata andypadgetti subsp. nov.* in life is depicted online at:

https://www.flickr.com/photos/58349528@N02/23846100292/

Male *D. brevipalmata andypadgetti subsp. nov.* in life is depicted online at:

https://www.flickr.com/photos/ryanfrancis/50833160441/

and

https://www.flickr.com/photos/ryanfrancis/50826732436/

and

https://www.flickr.com/photos/ryanfrancis/50826827877/

Daraninanura brevipalmata daranini subsp. nov. is separated from the other two subspecies by having lime green instead of mint green to turquoise in the concealed and semi-concealed regions of the limbs and adjacent body. Males have a light brown dorsum peppered or spotted with irregular-shaped black flecks, often corresponding to tubercles, which (in both sexes) are larger in this subspecies than in the other two. The tubercles on the flanks come as far forward as the tympanum (above it), or at least close to it, versus not so in the other two species.

Females have a distinctive reddish-brown colouration on the dorsum.

The wide canthal stripe running from snout to eye has a distinct lower boundary as in *D. brevipalmata andypadgetti subsp. nov.* but the stripe is so wide as to make the brown region below very narrow. There are usually about five fairly large black spots of irregular shape on each side of the groin region. The underside of the throat in males has obvious areas of dark or darkened mottling or colouration on a yellow background, especially in the anterior parts, this not being the case in the other two subspecies, where it is generally simply yellow of even texture and intensity.

D. brevipalmata daranini subsp. nov. in life in amplexus is depicted online at:

https://www.flickr.com/photos/jono_hooper/27020910934/

or calling males at:

https://www.flickr.com/photos/12742129@N07/49114947031/

and

https://www.inaturalist.org/observations/14599470

Duellman *et al.* (2016) found the type and only species in the genus *Daraninanura* Hoser, 2020 to have diverged from its nearest living relative 35.1 MYA, necessitating the transfer of this species to a new genus and the genus to a new tribe as done within the paper of Hoser (2020).

Distribution: *D. brevipalmata daranini subsp. nov.* occurs in a range generally bound by the Border Ranges area in the south on the New South Wales and Queensland border, extending north to include wetter parts of south-east Queensland, with a centre of distribution being the Sunshine Coast, Queensland, Australia.

Etymology: *D. brevipalmata daranini subsp. nov.* is named in honour of Dara Nin, of Ringwood, Victoria, Australia who has worked with the team at Snakebusters: Australia's best reptiles shows and various wildlife conservation activities over a ten year period in recognition of his contributions to wildlife conservation in Australia. Etymology is as for the genus.

On one occasion while doing a reptile display at Morwell in Victoria he successfully stopped Bana Irvine Osborne and her mother Margaret Irvine Osborne from stealing reptiles from a wildlife display (in breach of a court order). The two were later found attempting to steal material from cars.

DARANINANURA BREVIPALMATA ANDYPADGETTI SUBSP. NOV.

LSIDurn:lsid:zoobank.org:act:A24ED582-8BE1-4875-B484-A777AD4F4E8A

Holotype: A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.147667 collected from Juhles Mountain Rd, Two Mile Creek, Lansdowne State Forest, New South Wales, Australia, Latitude -31.7861 S., Longitude 152.60833 E. This government-owned facility allows access to its holdings.

Paratype: A preserved specimen at the National Museum of Victoria, Melbourne, Victoria, Australia, specimen number D58639 collected from 4 km north-east of Byabarra, New South Wales, Australia, Latitude -31.5 S., Longitude 152.57 E.

Diagnosis: The genus *Daraninanura* Hoser, 2020 monotypic for the type species *D. brevipalmata* (Tyler, Martin and Watson, 1972) is readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: Rich brown to chocolate brown or reddish brown above, occasionally with scattered small black flecks or similar such markings, usually being semi-distinct or indistinct. There is a wide canthal stripe running from snout to eye, continuing past the eye as a wide black band, almost over-writing the standard (for frogs) sized tympanum, continuing to the flank and sometimes bordered above with white or yellow. The upper lip has a narrow white or yellow stripe, narrowly edged below with brown, which continues as a glandular stripe from the angle of the mouth to the base of the forearm. The lower flanks are yellowish to whitish with scattered black spots, flecks or peppering. Groin is green or blue green. There are no red or orange spots on the hind side of the thighs. There is a dark stripe along the front edge of the hindlimb. Venter is white to light yellow. Top of iris is silver to gold in colour.

Skin is smooth to slightly leathery above and coarsely granular below. There are small and widely scattered tubercles on the upper flanks, being largest and most numerous at about the middle of the dorsum. Snout is rounded in shape. Vomerine teeth are prominent between the choanae. There is no pectoral fold. Finger and toe discs are of medium size, fingers are unwebbed and toes about one third webbed.

There is a prominent inner metatarsal tubercle and an indistinct small outer tubercle. The second finger is longer than the first, the first finger being so short that when pressed together with the second, it reaches no further than the base of the disc of the second.

It is not widely known that adults of this species are sexually dimorphic.

Males are characterised by a strong yellowish colour of lighter areas of the upper surfaces, in particular the upper labial and throat regions, versus generally white or whitish in females.

Adults of the three subspecies are readily separated from one another as follows:

Nominate *Daraninanura brevipalmata brevipalmata* has mint green to turquoise in the concealed and semi-concealed regions of the limbs and adjacent body. The dorsum of females is greyish brown, sometimes with a slight reddish tinge. In both sexes there are semi-prominent dark grey flecks across the dorsal surface and ten or more scattered black spots of irregular shape on each of the rear lower flanks. The wide canthal stripe running from snout to eye has an indistinct lower boundary.

Tubercles on the upper flanks do not come near the tympanum.

Nominate *D. brevipalmata brevipalmata* of both sexes are depicted in life in Cogger (2014) on page 153. Anstis (2013) also shows images of this taxon at various life-cycle stages.

A male of the subspecies is also depicted in life online at: https://www.flickr.com/photos/14807473@N08/3558431834/

and females at:

https://www.flickr.com/photos/thelizardlab/50813283642/

and

https://www.inaturalist.org/observations/73373295

Daraninanura brevipalmata andypadgetti subsp. nov. has mint green to turquoise in the concealed and semi-concealed regions of the limbs and body. The wide canthal stripe running from snout to eye has a distinct lower boundary and is significantly narrower than seen in the other two subspecies, with there being a distinctive wide light brown strip or region between the canthal stripe and the whitish or yellowish upper labial area.

Tubercles on the upper flanks do not come near the tympanum.

The dorsum of both sexes lacks mottling or obvious pigment, instead being generally greyish chocolate brown or chocolate brown in females and yellowish-brown in males.

In the groin area of either side are about 5 black spots of irregular shape and size, being generally medium in size and distinct.

Female *D. brevipalmata andypadgetti subsp. nov.* in life is depicted online at:

https://www.flickr.com/photos/58349528@N02/23846100292/

Male *D. brevipalmata andypadgetti subsp. nov.* in life is depicted online at:

https://www.flickr.com/photos/ryanfrancis/50833160441/

and

https://www.flickr.com/photos/ryanfrancis/50826732436/

and

https://www.flickr.com/photos/ryanfrancis/50826827877/

Daraninanura brevipalmata daranini subsp. nov. is separated from the other two subspecies by having lime green instead of mint green to turquoise in the concealed and semi-concealed regions of the limbs and body. Males have a light brown dorsum peppered or spotted with irregular-shaped black flecks, often corresponding to tubercles, which (in both sexes) are larger in this subspecies than in the other two. The tubercles on the flanks come as far forward as the tympanum (above it), or at least close to it, versus not so in the other two species.

Females have a distinctive reddish-brown colouration on the dorsum.

The wide canthal stripe running from snout to eye has a distinct lower boundary as in *D. brevipalmata andypadgetti subsp. nov.* but the stripe is so wide as to make the brown region below very narrow. There are usually about five fairly large black spots of irregular shape on each side of the groin region. The underside of the throat in males has obvious areas of dark or darkened mottling or colouration on a yellow background, especially in the anterior parts, this not being the case in the other two subspecies, where it is generally simply yellow and of even complexion and intensity.

D. brevipalmata daranini subsp. nov. in life in amplexus is depicted online at:

https://www.flickr.com/photos/jono_hooper/27020910934/

or calling males at:

https://www.flickr.com/photos/12742129@N07/49114947031/

and

https://www.inaturalist.org/observations/14599470

Duellman *et al.* (2016) found the type and only species in the genus *Daraninanura* Hoser, 2020 to have diverged from its nearest living relative 35.1 MYA, necessitating the transfer of this species to a new genus and the genus to a new tribe as done within the paper of Hoser (2020).

Distribution: *D. brevipalmata andypadgetti subsp. nov.* occurs in a range bound by the Hunter River in the south and the Border Ranges area in the north, generally being the New South Wales North Coast.

Etymology: *D. brevipalmata andypadgetti subsp. nov.* is named in honour of Andy Padgett of Park Orchards, Victoria, Australia who has worked with the team at Snakebusters: Australia's best reptiles shows and various wildlife conservation activities over a ten year period in recognition of his contributions to wildlife conservation in Australia.

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CONFLICT OF INTEREST - NONE

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Incubation and hatching of juvenile Marbled Gecko *Christinus marmoratus* (Gray, 1845).

LSIDURN:LSID:ZOOBANK.ORG:PUB:5E2B407E-7F81-4E18-B5EB-5BB8537EFEB3

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Received13 February 2021, Accepted 28 Feb 2021, Published 15 May 2022.

ABSTRACT

This paper reports on the incubation and successful hatching of eggs from the common but little-known Australian gecko species *Christinus marmoratus* (Gray, 1845).

Keywords: Gekkota; *Christinus*; *marmoratus*; gecko; lizard, Victoria, Australia; incubation; eggs, hatch.

INTRODUCTION

The potentially composite species of gecko originally described as *Diplodactylus marmoratus* Gray, 1845, most recently transferred to the newly erected genus genus *Christinus* Wells and Wellington, 1985, is known to occur across drier non-arid parts of southern Australia, from New South Wales across to Western Australia, including Victoria and South Australia, but not Tasmania.

The original distribution of the species around Melbourne, Victoria is not well-known, but in the 200 years since European settlement, the species has become established in most suburbs of Melbourne, including inner ones and including south to include Geelong in the west and the Mornington Peninsula in the south-east. Around Melbourne, the species is most common in bush on the basalt plains of North-west Melbourne and western Melbourne and outside this zone is most common in urbanised areas. In these areas, they are usually found around rubbish in gardens in the form of hard ground cover, such as wood piles and the like. They commonly enter homes, in particular older ones in inner suburbs and wooden homes elsewhere.

This paper reports a case of a successful opportunistic incubation and hatching of a juvenile of this species.

A single gravid female was removed from a home in Box Hill North, Victoria, following a call from a distressed women to have the “reptile” taken away.

The lizard was captured pursuant to a government issued “Wildlife Controller’s License”.

On 20 December 2018, the lizard was caught and placed in a plastic tub, after which it was transported to the Snakebusters facility at the address of 488 Park Road, Park Orchards, Victoria, 3134, Australia, pending “relocation” in a suitable place elsewhere.

Before release at a council reserve in East Kew, Victoria, and on the same date, the lizard laid two apparently good fertile eggs. These were immediately placed in an incubator to be hatched prior to release of the young in accordance with the controller’s permit.

MATERIALS AND METHODS

Including the preceding, the eggs were incubated as follows. They were placed in a plastic “Sistema” tub about 32 cm in length, X 19 cm wide, X 11 cm high with no air holes or ventilation. Moist vermiculite was inside the container, which was about 2-3 cm deep. On this and half buried were the two eggs, placed separate from one another. Thermometers (both max/min, and single temperature reading ones) were placed inside the container in order to monitor and check incubation temperature. The humidity in the vermiculite and container was such that inside the incubator, there was slight fogging of parts of the top of the container only, with most of the sides being dry to touch. The vermiculite was damp, but if squeezed, did not yield water.

The container was opened about one a week for a few seconds to allow air change.

The incubator, itself a modified fridge, was powered by a heat mat at the base, two thermostats controlling the heat-mat and fan operation and temperature, being set to about 29.5 degrees C.

This had been tested and calibrated to the incubation container prior to the eggs being placed in there as this is the same set up used for snake eggs most years.

The 3 computer fans in the incubator are used to blow air through the incubator to maintain a steady temperature throughout.

From testing it was confirmed that the eggs in the container were kept within a tight range of 29-30 degrees Celsius although elsewhere within the fridge / incubator, the temperatures recorded and oscillations between on / off cycles for the heat mat and fans were more wide ranging.

The plan had been to leave eggs in the incubator as described above until either they hatched or went off, being whatever came first.

This is the same incubation method (including incubation temperatures) used by myself to successfully incubate more than ten clutches of Eastern Brown Snake *Pseudonaja textilis* (Duméril, Bibron and Duméril, 1854) eggs (all captive mated) in

the period 2014 to 2021 and python eggs on various occasions. See brown snake with eggs at:
https://www.flickr.com/photos/thesnakeman/6671138279/
See brown snake eggs incubating in image at:
https://www.flickr.com/photos/thesnakeman/6671138309/
And hatching in image at:
https://www.flickr.com/photos/thesnakeman/6671069779/

This was including the world's first Queensland Black-headed Python (male) *Aspidites melanocephalus* Krefft, 1864, X Queensland Carpet Python (female) *Morelia macdowelli* Wells and Wellington, 1983 cross breeding (by accident). Those eggs were laid on 21 November 2017 (no mating date known or observed).

Based on the young, the father was identified as the Queensland Black-headed Python (originally bred by Neil Sonnemann of Murmungie, Victoria) and the two snakes had occupied a box together when transported to and from reptile shows in the previous 2 years on numerous undocumented occasions. These eggs hatched and young emerged on 30 Jan 2018.

12 of 13 eggs hatched, all this lot being incubated as a single egg mass, as laid, and all young hatched in good health.

The non hatching egg was at the centre of the base of the mass and is believed to have died in incubation due to its position in the mass, but the exact reason for non-hatching is not known.

That egg was a shrunken and hard mass with no evidence of development when inspected at time of the other eggs hatching. 9 of the 12 snakes ended up surviving to adulthood. Two died suddenly in their first year at several months of age.

A third snake was stolen at a reptile display on 9 December 2018. It was recovered by the Victoria police in a planned armed raid on the thief, Matthew Christopher Gatt of 12 Domain Drive, Hillside, Victoria, complete with parasitic snake mites 3 weeks later on 31 December 2018.

The snake died of mite-borne viral disease shortly thereafter.

Matthew Gatt was charged and convicted and fined 8 thousand dollars on 21 March of 2019.

As of 13 February 2021, nine of that litter remained alive and well.

Some of those snakes at various ages are depicted online at:
https://www.flickr.com/photos/thereptileman/48781145103/
and
https://www.flickr.com/photos/thereptileman/48781160003/
and
https://www.flickr.com/photos/thereptileman/48736752052/
and
https://www.flickr.com/photos/thereptileman/48781549921/
and
https://www.flickr.com/photos/thereptileman/48781479611/

By colouration, they most closely resemble their mother, but by head scalation, the large posterior head shields are not unlike those of the Queensland Male Black-headed Python, complete with single large parietal on either side. The snakes have distinctively narrower heads than normal Queensland Carpet Pythons and the lower labial pits are present, but reduced in size, depth and number.

RESULTS

A single *Christinus marmoratus* egg hatched on 11 Feb 2019, one apparently good egg of slightly yellowish colour (as opposed to white) did not hatch, but there was no evidence of it going off in any way as of 11 Feb 2019.

The hatchling appeared normal in all ways for the species and measured 2.4 cm in snout-vent and 5.3 cm tail length at time of hatching. It was released in the same location as the parent female.

Incubation time at 29.5 C (average temp) was 53 days.

There is no evidence available to suggest the incubation method or temperature precluded the other egg from hatching and the reason for the non-hatching of that egg is not known.

DISCUSSION

It is reasonable to expect that eggs laid by wild *Christinus marmoratus* in and around Melbourne would most of the time, not hatch as fast as the egg incubated at our facility on the basis that likely incubation temperatures would invariably be both lower and/or subject to wider fluctuations.

However the incubation technique and success indicated in this paper can be relied upon as part of the scientific record and as a template for any captive breeding of this and other similar species of Australian gecko.

CONCLUSION

Successful incubation and hatching off eggs is an essential part of captive breeding in geckos and other potentially threatened species. Documentation of methods that actually work are an important part of this wildlife conservation effort. The use of thermally inert incubators such as old fridges, may enhance success in hatching reptile eggs, especially when otherwise regulation of incubation temperatures may be difficult.

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African viper taxonomy revisited. The classification of Hoser (2013) stands the tests of new technology and time; with a new subgenus and a new species from Southern Africa formally named (Serpentes: Viperidae).

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ABSTRACT

In 2013, I (Raymond Hoser) published a major revision of the African viperidae, which divided Puff Adders *Bitis arietans* (Merrem, 1820) and Berg Adders *Bitis atropos* (Linnaeus, 1758) into multiple species, as well as dividing Horned Adders *Bitis caudalis* (Smith, 1839) into three subspecies.

Two new subgenera were also erected for relatively divergent taxa.

A number of studies have been published since 2013 that have in effect completely validated and confirmed the taxonomic and nomenclatural position of Hoser (2013), e.g. Wittenberg *et al.* (2014) and Barlow *et al.* (2019), especially with respect of the species level divisions.

A recent study, that being of Ceríaco *et al.* (2020), again effectively confirming the Hoser species divisions, also provided molecular evidence that showed that the species *Bitis heraldica* (Bocage, 1889), placed by Hoser (2013) and other (cited) earlier authors in the subgenus *Calechidna* Tschudi, 1845 is sufficiently divergent from others in that subgenus and the other subgenera of *Bitis* Gray, 1842 to warrant being placed in its own subgenus.

Ceríaco *et al.* (2020) also provided a molecular basis to explain the well-known morphological divergence between the two main populations of putative *Bitis rubida* Branch, 1997.

With the preceding as a starting point, this paper formally erects a new monotypic subgenus to accommodate *B. heraldica* as well as formally dividing *B. rubida* into two and naming the new species *Bitis* (*Calechidna*) *benjaminswilei sp. nov*.

Keywords: Taxonomy; nomenclature; Africa; Viper; viperidae; snake; South Africa; *Bitis*; *Calechidna*; *Macrocerastes*; *Keniabitis*; *Klosevipera*; *Kuekus*; *somalica*; *arietans*; *atropos*; *tomcottoni*; *oflahertyae*; *brianwallacei*; *lourenceklosei*; *pintaudii*; *matteoae*; *swileae*; *kajerikbulliardi*; new subgenus; *Angolavipera*; new species; *benjaminswilei.*

INTRODUCTION

Following from extensive fieldwork in Southern Africa in 2009, I (Raymond Hoser) published a series of papers revising the taxonomy and nomenclature of African Vipers, including Hoser (2013a-c).

Hoser (2013a) specifically dealt with the genus *Bitis* Gray, 1842, excluding putative *Bitis*

(*Macrocerastes*) *gabonica* (Duméril, Bibron and Duméril, 1854) and *Bitis* (*Macrocerastes*)

nasicornis (Shaw, 1802) which were divided two and five ways in Hoser (2013b).

Via a discredited rambling document known as Kaiser *et al.* (2013) or "the anti-ICZN rant", a group known as the Wolfgang Wüster gang of thieves, synonymised all the relevant taxa formally named by Hoser (2013a-c).

There was not a shred of evidence to support this highly unscientific act, but what the Wolfgang Wüster gang lacked in science, they more than made up for with their aggressive harassment of anyone who dared to use the relevant "Hoser-names" for these or any other taxa.

The Kaiser *et al.* (2013) manifesto, morphed many times to become a wholesale attack on numerous scientists and their

works.

This included for example any scientist or herpetologist of Russian origin (Uetz 2022).

More than 1,000 papers in one go, were in effect erased from the (his) published scientific record (his search engine optimised reptile database, claiming to be a “complete” archive of scientific names in herpetology), and ultimately came to be used by the Wolfgang Wüster gang of thieves as a veto in which they could do the following:

1/ Make a false and defamatory claim about a scientist and their work and then,

2/ Illegally and in breach of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999), they would simply lift the original author’s evidence from their paper, rebadge it as their own work and then rename the same taxon, followed by,

3/ Hijacking online databases and the like and using next level “black hat” “search engine optimisation” (AKA “SEO”) techniques online to make sure as many people as possible used the Wolfgang Wüster gang of thieves names instead of the correct ICZN ones, which they made sure were hidden when searched for via “Google” and other search engines, even when searched for by exact name.

4/ Critically important to the dishonest actions of the Wolfgang Wüster gang of thieves was control of Peter Uetz and his search engine optimised “The Reptile Database”, which was anything but, in that over 1,000 scientific papers, works and names were deliberately omitted from this database in order to corruptly peddle the Wolfgang Wüster gang of thieves names as the only and correct ones.

Significant is that almost without exception, the Wolfgang Wüster gang of thieves names on the Uetz site were illegally coined junior synonyms of correct ICZN names that Uetz and the Wolfgang Wüster gang of thieves had made sure did not appear either on their database or other sites they could hijack and control like the hate site “Wikipedia” and several others.

Eventually the Kaiser *et al*. (2013) war cry morphed into another anti ICZN document called Rhodin *et al*. (2015) which ironically was a formal application to the ICZN to have the works of myself, Raymond Hoser, erased from the scientific record, to allow the Wolfgang Wüster gang of thieves the right to rename all the same taxa and claim “name authority” and kudos for the work of others.

Rhodin *et al*. (2015) was always doomed to fail as it was in effect an application to the ICZN to destroy the *International Code of Zoological Nomenclature* and worse still for the couple of dozen scientists on the ICZN to surrender their authority to Wolfgang Wüster and his gang of thieves, which simply was never going to happen.

The ICZN formally squashed the Wolfgang Wüster gang of thieves plan in a near unanimous vote in 2020, the result of which was published by ICZN in April 2021.

Meanwhile in tandem with the unscientific attacks by the Wolfgang Wüster gang of thieves, various studies were continued on the relevant viper species. Other herpetologists revisited the Hoser papers and their results agreed with the findings of Hoser (2013a and 2013b) including for example Wittenberg *et al*. (2014) and Barlow *et al*. (2019),

In July 2020, Ceríaco *et al.* (2020) published their own findings on the genus, with specific reference to the little known Angolan Viper *Bitis heraldica* (Bocage, 1889).

That snake being morphologically similar to smaller southern African viper species, had previously been placed in the subgenus *Calechidna* Tschudi, 1845 including by myself in Hoser (2013).

However Ceríaco *et al.* (2020) found that the species appeared to be more closely related to the large bodied species within *Macrocerastes* Reuss, 1939 and in their paper, effectively placed it within that subgenus.

Ceríaco *et al.* (2020) estimated a 11-15 MYA divergence of *Bitis heraldica* from others within their *Macrocerastes* group, in which they also placed *Bitis parviocula* Böhme, 1977, as the most divergent other member in that group.

Hoser (2013), placed *B. parviocula* in a newly erected subgenus *Kuekus* Hoser, 2013 based on obvious divergence from the other members of *Macrocerastes.*

The Wolfgang Wüster gang lampooned Hoser (2013) for erecting a monotypic genus for the putative species, but as foreshadowed by myself, a second species within the same subgenus was formally named *Bitis harenna* by Gower *et al.* (scooping myself) in the PRINO (peer reviewed in name only) online “journal” *Zootaxa* in 2016.

In its own right, 11-15 MYA divergence in snakes is usually sufficient grounds for subgenus-level recognition. Combined with the significant morphological divergence between *B. heraldica* and all other members of the subgenera *Macrocerastes* and *Kuekus* all of which are significantly larger and more heavily built snakes, the case for erecting a new subgenus for *B. heraldica* is compelling.

Therefore the subgenus *Angolavipera subgen. nov.* is formally erected to cover this taxon, which also happens to be endemic to Angola.

Ceríaco *et al.* (2020) also provided a phylogeny that showed in their words:

“*B*. (*Calechidna*) *rubida* is made paraphyletic by *B.* (*Calechidna*) *albanica*”.

They did not take this proposition further in their paper and no one else has done so since.

Ceríaco *et al.* (2020) was published before the ICZN formally squashed Kaiser *et al* (2013), and Rhodin *et al*. in 2021 (ICZN 2021).

The significance here was that Ceríaco *et al.* (2020) was published in the *African Journal of Herpetology*, itself hijacked by the Wolfgang Wüster gang of thieves and therefore they were forced to pretend that the paper of Hoser (2013a) did not exist.

Notable in the context of the above comments about *B. rubida* was their other comment:

“*B*. (*Calechidna*) *caudalis* is rendered paraphyletic by *B*. (*Calechidna*) *schneideri* and *B*. (*Calechidna*) *peringueyi*, suggesting the presence of cryptic species within the arenicolous dwarf adders”.

That statement was wholly dishonest in that at all materially relevant times, the authors were wholly aware of the Hoser (2013) paper that had formally named their so-called “cryptic species” that in hindsight happened to be in exact synchronisation with their later published, newly published molecular results in their ‘Fig 3”.

One of the co-authors, Aaron Bauer, a morbidly obese dishonest man, given to regularly stealing works or concepts of others to rush into print and scoop others to name new species of reptiles, had even co-authored a formal petition to the ICZN, separate to Rhodin *et al*. (2015) or the predecessors to that being Kaiser (2012a, 2012b, 2013) and Kaiser *et al*. (2013) asking the ICZN to formally suppress all the works of myself (Hoser), identified by name and including Hoser (2013a-c), so as to allow him and his cohort the right to rename them and claim “name authority”.

That was:

"*Case 3824: A special proposal to suppress certain names under the plenary powers of the Commission. Kevin R. Thiele, Paul M. Oliver, Aaron M. Bauer, Paul Doughty, Fred Kraus, Michael G. Rix and Hinrich Kaiser*."

published in volume 77: 2, of *Bulletin of Zoological Nomenclature* published on 30 April 2020, (online at: https://bioone.org/journals/the-bulletin-of-zoological-nomenclature/volume-77/issue-1/bzn.v77.a025/Notice-of-New-Applications-to-the-Commission-Case-38213826/10.21805/bzn.v77.a025.full) well predating the paper of Ceríaco *et al.* (2020) that was published on 8 July 2020.

Most of those co-authors had already stolen works of myself (Hoser) and renamed taxa in acts of egregious taxonomic vandalism, including for example Paul Oliver and Fred Kraus, while Paul Doughty and Hinrich Kaiser had also been busy stealing works of others and renaming the taxa they had already discovered and named (as per the war cries of Kaiser (2012a, 2012b, 2013), Kaiser *et al.* (2013) and Rhodin *et al.* (2015)), while Hinrich Kaiser and his sparring partner Larry Lee Grismer seemed also to have a bit of argy-bargy going on as they both engaged in taxonomic vandalism on an industrial scale, including against one another.

So in summary, Ceríaco *et al.* (2020) did a great job of publishing a molecular phylogeny, that in effect validated the taxonomy of Hoser (2013a and 2013b), with Hoser (2013c) not being applicable.

That is of course other than for the differences already raised herein, being:

1/ That *B. heraldica* should be in a different subgenus (flagged also by Wittenberg *et al.* (2014)) and,

2/ That putative *B. rubida* does in fact comprise two species.

I should also mention that in the case of putative *B. caudalis* (Smith 1839) split by Hoser (2013) into three subspecies, the molecular evidence of Ceríaco *et al.* (2020) showed that the two forms named by Hoser (2013), should in fact be treated as full species and that the treatment of Hoser (2013) had been far too conservative.

Agreeing with this more recent evidence from two sets of authors, being Wittenberg *et al.* (2014) and Ceríaco *et al.* (2020), I recommend the three taxa (all within the subgenus *Klosevipera* Hoser, 2013) should now be known as:

1/ *Bitis caudalis* (Smith, 1839)

2/ *Bitis swileae* (Hoser, 2013)

3/ *Bitis kajerikbulliardi* (Hoser, 2013)

Under the rules of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999 as amended online since) whether the three taxa are treated as species of subspecies, the binomial or trinomial remains the same. However if they are elevated from subspecies to species as done here, the name "*caudalis*' is dropped and the author name and year are put in brackets to indicate a change of status since original publication.

In case it has been overlooked, in 2021, the ICZN in ICZN (2021) formally rejected all the various applications by the Wolfgang Wüster gang of thieves as previously cited to have the publications of myself (Raymond Hoser) or any other scientist erased from the scientific record to enable any of Hinrich Kaiser, Aaron Bauer, or gang leader Wolfgang Wu¨ster to have the right to steal name authority with the stamp of approval by the ICZN.

In defiance of scientists worldwide, Wuster has since published in multiple places an intent to attack and destroy both the *International Code of Zoological Nomenclature* and to set himself and his anti-science gang up as an alternative arbiter of scientific names and who gets to chose them.

Their stated plan is to depose the rulings of the ICZN and the over 200 years old set of rules governing scientists world-wide, known as the Linnaean Code.

MATERIALS AND METHODS

The flagging of an unnamed subgenus and an unnamed species of southern African vipers is already indicated in the abstract and preamble.

The differences between the forms in question is obvious and well-known and so there was little "new" investigation required, other than a routine check of literature for potential synonyms (of which none were found) and re-inspection of relevant specimens, including a search for potential intermediates, to confirm and identify known differences in a way that complies with the rules of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999 as amended online since).

All the relevant putative taxa are well-known to me from studies spanning decades, including in the wild in the relevant areas in 2009.

Of course the recommendations of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999 as amended online since) at Appendix A, part 2, states:

"*A zoologist should not publish a new name if he or she has reason to believe that another person has already recognized the same taxon and intends to establish a name for it (or that the taxon is to be named in a posthumous work). A zoologist in such a position should communicate with the other person (or their representatives) and only feel free to establish a new name if that person has failed to do so in a reasonable period (not less than a year).*"

With no explicit statement by anyone anywhere expressing an intent to name either of the relevant unnamed taxa identified herein, or for that matter any statement of intent, actual or implied by Ceríaco *et al.* (2020), even though their paper does by implication identify both (as well as other taxa previously named that are effectively ignored as well), and that paper having been published more than 18 months ago, I have no hesitation in formally naming the two taxa identified herein, being one subgenus and one species.

Specimens of the relevant taxa were inspected either live, dead, or via images sent to me from others in possession of them. Included were photos with good locality data of the said taxa.

Relevant descriptive literature was checked to confirm key characters of the relevant and comparable species.

This included Branch (1997, 1999), Branch and Bauer (1995), Barlow *et al.* (2019), Bocage (1889), Burger (1993), Ceríaco *et al.* (2020), Chippaux and Jackson (2019), Dobiey and Vogel (2007), FitzSimons (1946), Gonçalves *et al.* (2019), Haacke (1975), Hoser (2013a, 2013b, 2013c), Klose (2013), Kucharzewski (2011), Lenk *et al.* (1999), Marques *et al.* (2018), Martínez del Mármol (2020), McDiarmid *et al.* (1999), Mertens (1958), Phelps (2010), Ride *et al.* (1999), Spawls and Branch (1995), Visser (1979), Wallach *et al.* (2014), Wittenberg *et al.* (2014) and sources cited therein.

RESULTS

Following this above described process, as in confirming the differences between the putative forms and matching it with the molecular evidence of Ceríaco *et al.* (2020) the decision to formally name the relevant taxa was confirmed.

INFORMATION RELEVANT TO THE FORMAL DESCRIPTIONS THAT FOLLOW

There is no conflict of interest in terms of this paper or the conclusions arrived at herein.

Several people including anonymous peer reviewers who revised the manuscript prior to publication are also thanked as are relevant staff at museums who made specimens and records available in line with international obligations.

Wild specimens inspected in 2009 were done so with the express written permission of relevant government officials in South Africa.

In terms of the following formal descriptions, spellings should not be altered in any way for any purpose unless expressly and exclusively called for by the rules governing Zoological Nomenclature as administered by the International Commission of Zoological Nomenclature (ICZN).

This includes if gender assignment, suffixes or Latinisation seems incorrect, apparent spelling mistakes and so on.

Material downloaded from the internet and cited anywhere in this paper was downloaded and checked most recently as of 6 May 2022 (including if also viewed prior), unless otherwise stated and was accurate in terms of the content cited herein as of that date.

(Note for example that Peter Uetz, has made numerous edits to his website at:
http://www.reptile-database.org/db-info/news.html
since his 10 March 2022 publication, including a major re-write on 20 March 2022, which reflects the ephemeral nature of a lot of what is online).

Any online citations within this paper, including copied emails and the like, are not as a rule cited in the references part of this paper and have the same most recent viewing date as just given.

Unless otherwise stated explicitly, colour and other descriptions apply to living adult specimens of generally good health, as seen by day, and not under any form of stress by means such as excessive cool, heat, dehydration, excessive ageing, abnormal skin or reaction to chemical or other input.

While numerous texts and references were consulted prior to publication of this paper, the criteria used to separate the relevant genera, subgenera, species or subspecies has already been spelt out and/or is done so within each formal description and does not rely on material within publications not explicitly cited herein.

ANGOLAVIPERA SUBGEN. NOV.

LSIDurn:lsid:zoobank.org:act:9E8254E9-7544-4E5D-9E48-BE0F28E2F39A

Type species: *Vipera heraldica* Bocage, 1889.

Diagnosis: This subgenus (*Angolavipera subgen. nov.*) can be easily distinguished from other small species within the genus *Bitis* due to its heavily speckled venter, the presence of a “trident” on its forehead and absence of supraocular ornamentation (Mertens 1958).

This subgenus (*Angolavipera subgen. nov.*) is separated from all the larger species within the genus *Bitis* (including all *Macrocerastes*) by the presence of 25-27 mid-body rows, versus 29-41 in all other species.

Distribution: The known distribution of *Angolavipera subgen. nov.* is limited to the rocky slopes at high elevation in western regions of the Angolan central plateau, namely in the provinces of Kwanza Sul, Huambo, Bié, and northern Huíla, being known from no more than eight different localities (Marques et al. 2018).

Content: *Bitis* (*Angolavipera*) *heraldica* (Bocage, 1889). (Monotypic).

BITIS* (*CALECHIDNA*) *BENJAMINSWILEI SP. NOV.

LSIDurn:lsid:zoobank.org:act:5680B5F6-B694-4574-B8D3-0621EF34A3DA

Holotype: A preserved specimen at the Port Elizabeth Museum, Port Elizabeth, South Africa, specimen number: PEM R4347, collected on 22 September 1976 at Swartberg State Forest, Paardevlei, Western Cape Province, South Africa, Latitude 33.2059 S., Longitude 22.0’00 E. at an altitude of 1300 metres. This facility allows access to its holdings.

Paratypes: Two preserved specimens at the Ditsong National Museum of Natural History, formerly the Transvaal Museum, Pretoria, South Africa, specimen numbers TM 56634 and TM 56635 collected in August 1977 from Waterkloof, Swartberg Mountains, Western Cape Province, South Africa, Latitude 33.27 S., Longitude 21.17 E., at an altitude of 1006 metres.

Diagnosis: *Bitis* (*Calechidna*) *benjaminswilei sp. nov.* is readily separated from *Bitis* (*Calechidna*) *rubida* Branch, 1997, by having a bold pattern on the dorsum with two or three bold white or whitish stripes radiating from the eye (or just anterior to it for one stripe) to the lip, these widening slightly towards the labials and not necessarily being straight. In *B. rubida*, the pattern on the dorsum is subdued and not bold, while the white stripes radiating from the eye to the lip (if present) are heavily infused with red, orange or grey, making them relatively indistinct.

Contrasting markings on the head of *B. benjaminswilei sp. nov.* are bold and strongly contrasting, versus indistinct or semidistinct in *B. rubida.* In *B. benjaminswilei sp. nov.* dark blotches on the dorsum are bordered laterally with obvious light grey patches, versus either not so, or indistinctly so in *B. rubida.*

B rubida and *B. benjaminswilei sp. nov.* both endemic to South Africa are separated from similar South African vipers as follows:

They are characterized by lacking, or having greatly reduced, elongate scales (‘horns’) in the supraorbital region, and by having a drab, usually reddish, dorsal colouration in *B. rubida* or a well-marked dorsal colouration in *B. benjaminswilei sp. nov.*.

The two species can be readily separated from other small *Bitis* vipers by various scutellation

features. They differs from *B. xeropaga* Haacke, 1975 in having fewer ASR (anterior scale rows, measured one head length behind the neck) than MSR (being mid-body scale rows) (ASR equal to or greater in number than MSR in *B. xeropaga*; Haacke 1975), and lower ventral scale counts in both sexes (*B. xeropaga*- males 147-154, mean 151.5; females 151-155, mean 152.4; Haacke 1975).

They differ from *B. atropos* Linnaeus, 1758 (and associated taxa as identified in Hoser 2013a) in having a raised supraorbital ridge. They differ from sympatric and southern populations of *Bitis cornuta* (Daudin, 1803) in having lower ventral scale counts in both sexes, fewer circumorbitals, and usually 29 mid-body scale rows. *Bitis cornuta* usually has 27 mid-body scale rows and a slightly higher number of dorsal blotches.

It also differs from *B. rubida* and *B. benjaminswilei sp. nov.* in always having prominent supraorbital ‘horns’ and usually a contrasting colour pattern of grey, white and black (reddish in a population near Lang Hoogte, 35 km east Kleinsee). *Bitis rubida* and *B. benjaminswilei sp. nov.* do not occur in sympatry with *B. armata* (Smith, 1826), which is restricted to coastal regions of the south-western Cape. The latter has

much lower ventral scale counts (115-128), slightly lower subcaudal counts and rictals, usually 27 mid-body scale rows, and a higher number of circumorbitals. *B. armata* also usually has obvious supraorbital 'horns' (although these are less well developed than in *B. cornuta*), as well as a grey-black-white colouration (that is less well defined than that of *B. cornuta*). *Bitis inornata* (Smith, 1838) and *B. albanica* (Hewitt, 1937) are restricted to the Eastern Cape Province and are well isolated from the western taxa, including *B. rubida* and *B. benjaminswilei sp. nov.*. The two eastern species are distinguished by having short tails in males, in which the hemipenes reach only the 6-7th subcaudal (9-10th subcaudal in the other taxa). Supraocular 'horns' are greatly reduced or absent in *B. albanica*, which also has a bold, contrasting, grey-black-white colour pattern, with fewer dorsal blotches than in the western taxa. *Bitis inornata* completely lacks supraorbital 'horns', and has a very drab yellowish-brown colouration, in which the dorsal blotches are greatly reduced or absent. The eastern taxa are allopatric and separated from one another by about 150 km (modified from Branch 1997).

Photos of the type form of *B. rubida* in life can be seen in Branch (1997) on page 38 (top), Marias 1994, pages 76 and 77 and online at:

https://www.inaturalist.org/observations/91568853

and

https://www.inaturalist.org/observations/11163939

Photos of *B. benjaminswilei sp. nov.* in life can be found online at:

https://www.inaturalist.org/observations/102106716

and

https://www.flickr.com/photos/cowyeow/6143433859/

Distribution: *B. benjaminswilei sp. nov.* occurs in the Swartberg Mountains of South Africa. Morphologically similar specimens from Oudtshoorn are also assigned to this taxon. *B. rubida* occurs from the type locality in the Cedarberg which is in the north-western extremity of the range. From there it extends south along the Piketberg and Skurweberg to the vicinity of Ceres. It is also found at lower altitudes to the vicinity of Anysberg.

Specimens found inland on the Roggeveldberg and Komsberg of the inland escarpment, reaching near Middelpos are not assigned to either species. Specimens from Laingsburgh appear to be most similar morphologically to *B. benjaminswilei sp. nov.*.

Conservation: The newly named species *B. benjaminswilei sp. nov.* does not appear to be threatened any more than all other reptiles are in South Africa due to the human population explosion in that country, but the comments regarding extinctions of newly identified or named reptile species in Hoser (2019a, 2019b) certainly apply in the case of this taxon.

Branch (1997) wrote when describing *B. rubida*:

"*It is evident that some dwarf adders (e.g. the Namaqua dwarf adder,* B. schneideri*) are already threatened, in part, by illegal collecting for this trade (Branch 1988b). South Africa is a signator of the Rio Convention on Biodiversity, and also of the Convention on the International Trade in Endangered Species of Wild Fauna and Flora. It is important that new, localized and endemic species be described timeously to allow for their consideration and possible inclusion in conservation legislation and action.*"

This is one reason why I am not hesitating in formally describing and naming *B. benjaminswilei sp. nov.*.

Etymology: The new species *Bitis* (*Calechidna*) *benjaminswilei sp. nov.* is named in honour of Benjamin Swile of Athlone, (Cape Town), Western Cape in South Africa in recognition of his services to herpetology in South Africa including assisting with my own field work in the region.

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CONFLICTS OF INTEREST

None.

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Anepischetosia maccoyi (Lucas and Frost, 1894)
Adult from Launching Place, Victoria.
Photo: Raymond Hoser.