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Carphodactylidae reviewed: Four new genera, four new subgenera, nine new species and four new subspecies within the Australian gecko family (Squamata: Sauria).

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ABSTRACT

Numerous studies and reclassifications of the Australian gecko family Carphodactylidae have been published in the previous three decades. These have resulted in the publication of a significant body of data, leading to the recognition of new genera and species.

Molecular studies have indicated further unnamed groups at both generic and species levels.

These taxa are all also readily identifiable on the basis of morphology.

The obvious unnamed taxa have therefore been formally described and named according to the rules of the *International Code of Zoological Nomenclature* (Ride *et al*. 1999).

The genus *Saltuarius* Couper, Covacevich and Moritz, 1993 is divided along obvious phylogenetic and morphological lines into two, the new genus being named *Shireengecko gen. nov.*. The two genera are both split into two subgenera.

Phyllurus Schinz, 1822 is split four ways with the three new genera being *Oxygecko gen. nov.*, *Couperus gen. nov.* and *Teesgecko gen. nov*. respectively.

Two divergent species groups of Knob-tailed Gecko *Nephrurus* Günther, 1876 *sensu lato* are formally named herein as subgenera, as *Quazinephrurus subgen. nov.* and *Paranephrurus subgen. nov.*.

Nine new species are also formally named.

These are two within the genus *Saltuarius sensu stricto* as defined in this paper; one within *Uvidicolus* Oliver and Bauer, 2011; one within *Carphodactylus* Günther, 1897; one within *Nephrurus sensu stricto* as defined in this paper; two smooth knob tailed geckos (*Quazinephrurus subgen. nov.*) and two species of Thick-tailed gecko *Underwoodisaurus* Wermuth, 1965. There are also four subspecies formally named.

The first ever key to the six species of *Underwoodisaurus* as defined herein is provided.

Carphodactylidae are also divided into four obvious tribes, with a further two subtribes identified and named.

Keywords: Taxonomy; lizards; gecko; nomenclature; Australia; Queensland; Cape York; Granite Belt; Wet Tropics; New South Wales; South Australia; Victoria; Western Australia; Northern Territory; Carphodactylidae; Carphodactylini; knob-tailed gecko; leaf-tailed gecko; thick-tailed gecko; *Carphodactylus*; *Nephrurus*; *Orraya*; *Phyllurus*; *Saltuarius*; *Uvidicolus*; *Underwoodisaurus*; new genus; *Shireengecko*; *Oxygecko*; *Couperus*; *Teesgecko*; new subgenus; *Quazinephrurus*; *Paranephrurus*; *Quazisaltuarius*; *Quazishireengecko*; new species; *hoserae*; *adelynae*; *jackyae*; *covacevichae*; *blacki*; *coreyrentoni*; *ianrentoni*; *mensforthi*; *perthensis*; new subspecies; *martinekae*; *bulliardi*; *kimberleyae*; *saxacola*; new tribe; Carphodactylini; Shireengeckiini; Nephruriini; Orrayini; new subtribe; Uvidicolina; Oxygeckoina; Nephruriina; Shireengeckiina.

INTRODUCTION

The Leaf-tailed, Thick-tailed and Knob tailed geckos, within the family Carphodactylidae have long been of interest to reptile hobbyists around the world. In spite of a government ban on exports of reptiles from Australia since the late 1960's and the fact that the family is endemic to continental Australia, neither fact have stopped large numbers of specimens being illegally exported from Australia to Europe and the USA, where specimens have been bred in quantities ever since (Hoser, 1993, 1996). While species have been described at a steady rate over the past two centuries, a greater number have been formally named in the past two decades than at any similar time prior (9 out of a total of about 33 recognized species).

The basis of this has been a number of significant molecular studies based on specimens either found in newly collected locations or taken from previously well-known, but believed to be widespread species.

These studies have revealed deep divergence between morphologically similar lizards, which have therefore had to be reclassified either as new species, or even as new genera.

The materials, methods and results of this paper are a review of the available published data from various recent studies, combined with inspection of live specimens of potentially unnamed taxa to ascertain whether or not they are distinct at either the species or genus level.

When found to be worthy of taxonomic recognition they have been formally described herein.

The same applies at higher levels, such as genus and tribe.

The most noteworthy recently published studies in terms of the taxonomy of the relevant species have been Couper, Covacevich and Moritz (2000) and Oliver and Bauer (2011), both of which resulted in new genera being formally named. Couper, Covacevich and Moritz (2000) and other papers by these authors and associates have resulted in a number of new species also being named as seen in the papers of Couper, Covacevich and Moritz (2008a) or Doughty and Oliver (2011).

Of relevance to the taxonomic judgements made herein is that the genera named by the relevant authors were the most divergent unnamed lineages identified in each paper. However both papers identified other potentially unnamed lineages of nearly as divergent antiquity and even went so far as to specify divergence dates.

Although it is self-evident from the papers, that in these cases the authors did not view these other lineages as warranting recognition as subgenera, it is my considered view that they have made what are in hindsight errors of judgement.

The divergences indicated in terms of the potential generic groups not named were according to Couper, Covacevich and Moritz (2008a) in the order of 31-38 MYA (at page 263).

I view that as more than sufficient divergence as to warrant recognition of each as separate genera.

Furthermore the lumping of divergent species groups in a single genus for species with divergences in excess of 30 million years is as of 2016, almost unheard of in herpetology.

By way of contrast, some Australian elapid species with divergences of less than 10 MYA are placed in separate genera (e.g. *Notechis* and *Austrelaps*).

On the basis of the following: 1/ These divergences are in excess of 30 million years, 2/ The fact that each of the relevant species groups are geographically separated by well known biogeographical barriers (drier and/or flatter zones) and 3/ The species themselves are morphologically distinct from one another, I have absolutely no hesitation for erecting three new genera for three unnamed species groups of Leaf-tailed Geckos.

Saltuarius Couper, Covacevich and Moritz, 1993 is divided, leaving the north Queensland lizards until now treated as the single species *S. cornutus* Ogilby, 1892 and the morphologically similar species group known until now as *S. salebrosus* (Covacevich, 1975) within the genus.

Each species is divided into two in this paper.

The remainder of the genus as originally defined, being those other species known from southern Queensland are placed in the new genus *Shireengecko gen. nov.*.

Each genus is also subdivided into two subgenera, *Quazisaltuarius subgen. nov.* and *Quazishireengecko subgen. nov.* for species groups based on morphological differences, geographical differences and molecular divergences as outlined by Couper, Covacevich and Moritz (2000).

Phyllurus Schinz, 1822, type species *P. platurus* Shaw, 1790 from the Sydney area in NSW is also divided. The north Queensland animals distributed around Townsville are placed in the new genus, *Oxygecko gen. nov.*, those from around the Mackay/Proserpine region are placed in the genus *Couperus gen. nov.* and those from the upper Sunshine Coast/Gladstone Region are placed in the genus *Teesgecko gen. nov.*.

Within the genus *Nephrurus* Günther, 1876 as defined by Oliver and Bauer (2011), these authors identified three main groups, each easily divided on the basis of phylogeny and morphology (see their Fig. 1). These were two groups of so-called Spiny Knob Tailed Geckos and additionally the so-called smooth ones. They found they diverged from one another somewhere between 9.7-19.7 MYA (at page 669).

Such divergences are certainly worthy of taxonomic recognition at the generic level.

While 19.7 MYA as a divergence time would certainly qualify for full genus-level recognition, taxonomic lumpers may baulk at recognising a species group with a marginally less than 10 MYA divergence as a full genus.

Therefore I take the most conservative position and formally name the two unnamed clades as subgenera.

The so-called Smooth Knob-tailed Geckos are formally named *Quazinephrurus subgen. nov.* and the clade including the species *N. wheeleri* and *N. cinctus*, are hereby placed in the subgenus *Paranephrurus subgen. nov.*.

At the species level, the molecular phylogenies of both Couper, Covacevich and Moritz (2000) and Oliver and Bauer (2011), indicated species-level divisions worthy of taxonomic recognition. It would be reckless to divide species solely on the basis of molecular results, but such do give valuable pointers as to where to look for further evidence.

As already inferred in this paper, if and when they corroborate morphological evidence, formal taxonomic recognition of entities is proper and done.

In the case of the relevant species, the published phylogenies of Couper, Covacevich and Moritz (2000) and Oliver and Bauer (2011) did indicate several putative species worthy of recognition and all newly named ones can be identified in these phylogenies.

Inspection of large numbers of live specimens of all relevant taxa have led me to make the following decisions.

Two new species are formally named within the genera *Uvidicolus* Oliver and Bauer, 2011 and *Carphodactylus* Günther, 1897, both of which had until now been treated as being monotypic.

In each case, proximate, but allopatric populations of the species (as recognized to date) were shown to be divergent by molecular analysis and also when specimens themselves were examined.

As a result the species have been formally named herein according to the rules of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999). These are *U. covacevichae sp. nov.* and *C. hoserae sp. nov.*.

The species *Saltuarius cornutus* Ogilby, 1892 has until now been treated by all authors as monotypic. However the molecular results of Couper, Covacevich and Moritz (2000) confirm my long held belief (since the 1970's) that there have been at least two species under this label, separated by a well known biogeographical barrier idenified by many authors including Moritz *et al.* (1993) and sources cited therein. The type form from south and south-west of Cairns in North Queensland remains *S. cornutus*, while the other species is herein named *S. adelynae sp. nov.*.

These two and the recently described species *S. eximius* Hoskin and Couper, 2013 form the entirety of the newly defined subgenus *Saltuarius subgen. nov.* although I note that under the rules of the *International Code of Zoological Nomenclature* (Ride et al. 1999), it should be more correctly reported by subsequent authors (and here) as *Saltuarius* Couper, Covacevich and Moritz, 1993.

I note here that a junior synonym for *S. cornutus*, namely *Phyllurus lichenosus* Günther, 1897 is not available for the newly named species, as it applies to the taxon *S. cornutus* with an immediately adjacent type locality and not the new species described herein.

Similar applies to the species *S. salebrosus* (Covacevich, 1975), herein divided into two on the basis of obvious morphological differences between two nearby population groups and molecular corroboration by Couper, Covacevich and Moritz (2000).

The new species is called *S.* (*Quazisaltuarius*) *jackyae sp. nov.*.

These two species form the entirety of the subgenus *Quazisaltuarius subgen. nov.*.

All other putatively monotypic genera within the Carphodactylidae as recognized until now are also no longer monotypic as a result of this paper.

Five other new taxa are also named as species. These are one within *Nephrurus sensu stricto* called *Nephrurus blacki sp. nov.*, two Smooth Knob-tailed geckos (*Quazinephrurus subgen. nov.*), called *N. ianrentoni sp. nov.* and *N. coreyrentoni sp. nov.* and two Thick-tailed Geckos *Underwoodisaurus* Wermuth, 1965, called *U. mensforthi sp. nov.* and *U. perthensis sp. nov.*.

One of the species within the *Underwoodisaurus milii* complex, namely *U. mensforthi sp. nov.* is further subdivided with a new subspecies being formally named as well. An unnamed subspecies of *N. levis* is also herein formally defined and named for the first time as *N. levis bulliardi sp. nov.*, this being the form from the region immediately north of the Nullabor Plain in western South Australia.

A morphologically distinct population of *N. sheai* is formally named as a subspecies, called *N. sheai kimberleyae subsp. nov.*, as is a population of *N. asper*, from far west Queensland, found in the southern Selwyn range, which is apparently isolated from the main population by the upper reaches of the Diamantina River system. This taxon is called *N. asper saxacola subsp. nov.*.

In terms of the taxonomic decisions made to recognize each entity, these are generally self-evident and need no elaboration beyond what I have already said.

However in terms of some, I make the following additional and relevant comments.

A unique population of putative *N. asper* from far north Queensland was identified by Couper and Gregson (1994). In that paper they decided the taxon was merely a colour morph of *N. asper.* However the later results of Oliver and Bauer (2011) at page 667 showed sufficient divergence to warrant recognition of these lizards as a full species. I therefore take the obvious position and formally name these animals as a species similar to *N. asper.*

As aluded to already, the populations of putative *N. sheai* Couper, 1994 from the Kimberley division of Western Australia are morphologically different from the type form from Kakadu, geographically separated and warrant taxonomic recognition. In the absence of molecular data for the comparative groups, I herein describe the unnamed form as a new subspecies, *N. sheai kimberleyae subsp. nov.*.

Oliver and Bauer (2011), wrote: “The uncorrected genetic divergence between two allopatric populations of *N. stellatus* across southern Australia (either side of the Nullarbor Plain) was also comparatively low (5.3%).” In the case of many other reptiles, far lower divergences have resulted in new species being erected (e.g. Harvey *et al.* 2000).

Again taking the most sensible position, I herein name the unnamed morphologically distinct form of putative *N. stellatus* Storr, 1968 as a new species.

Similar applies to the far west Australian population of putative *N. laevissimus* Mertens, 1958 which shows similar divergence and morphological differences from nominate *N. laevissimus* as does *N. deleani* Harvey, 1983.

The taxonomy of the *Underwoodisaurus milii* (Bory de Saint-Vincent, 1823) species complex has been one of lumping by most authors.

Ahead of his time, Boulenger (1913) described two divergent lineages as separate species. He did this by naming the second of the pair as *Gymnodactylus asper* Boulenger, 1913, with direct reference to the original species that at the time was also placed in the genus *Gymnodactylus* Spix, 1825, by stating clearly why he thought his new taxon was a different species.

All authors beyond 1913 have synonymised the two to treat all *U. milii* as a single widespread species.

Wells and Wellington (1983) made the next step in dividing *E. milii sensu lato* by describing the obviously different east coast form from the Sandstone region around Sydney, New South Wales as *U. husbandi* using a Hunter Valley animal as a holotype.

To their credit in 1985, Wells and Wellington (1985) went further and attempted to correct the taxonomy of the genus *Underwoodisaurus* in a meaningful way and resurrected the species *Underwoodisaurus asper* (Boulenger, 1913) while also recognizing the species they named two years prior. It is significant that the two men had considerable field experience across Australia with the relevant species and while their paper was brief in words, it was sufficient to indicate what they thought the real taxonomy was and why. They also directed readers to relevant images of the relevant forms in widely available published literature and on this basis recognition of the three morphotypes should have been settled.

Notwithstanding that this was the only serious attempt to resolve the taxonomy of *U. milii sensu lato*, the works of the pair have been generally boycotted and ignored by many herpetologists since (in part because of the improper tactics of a vocal few to influence the actions of a less concerned majority) and so taxonomy in Australia is in parts behind the times in terms of what the obvious evidence shows.

However science does eventually get to the truth, even if at the rate of one funeral at a time.

Although I probably shouldn’t say this in print, I also note that as of 2016 both Wells and Wellington are getting older and when they eventually do pass away, there will less personal animosity against the pair by younger herpetologists.

This should mean that their publications may be treated more objectively by later herpetologists and their sensible and obvious taxonomic judgements widely used.

Doughty and Oliver (2011) described as a new species, *Underwoodisaurus seorsus* as member of the *U. milii* complex from the Pilbara region of Western Australia, but significantly did not do a thorough review of the complex, as this would have necessitated the resurrection of the (until now) ignored Wells and Wellington taxon *U. husbandi* as a valid species-level taxon.

Doughty and Oliver form part of a strongly anti-Wells and Wellington group known as the Wüster gang (se Hoser 2015a-f).

Cogger (2014) taking a conservative position and not wanting to upset friends of his who may have hostility to Wells and Wellington, only recognized *U. milii* and *U. seorsus.* However in the early sections of his book, Cogger notes that much of what is within its pages is woefully out of date. He also refutes and discredits the central claims and aims of those who attack Wells and Wellington (and also myself) via a widely distributed blog rant known as Kaiser *et al.* (2013).

These individuals unreasonably attacking Wells, Wellington and their publications have been part of the group of people who seek to enact and enforce and illegal defacto ban on use of any Wells and Wellington taxonomy and nomenclature if they possibly can and with a view to eventually illegally seizing “name authority” for the very same taxa, even though such is expressly forbidden by the *International Code of Zoological Nomenclature* (Ride *et al.* 1999).

However in the face of all the above, the molecular results of

Oliver and Bauer (2011) also show deep species level phylogenetic divisions within the *U. milii* complex. The absence of East Australian *U. milii* from the phylogeny is conspicuous, but with the use of specimens from most other parts of the range, their phylogeny, provides strong molecular evidence for the recognition of the three species identified by Wells and Wellington (1985), these being *U. asper*, *U. husbandi* and *U. milii* and with these three being the minimum possible number of species in the species complex (and excluding the other later named taxon *Underwoodisaurus seorsus*) and that these are also the appropriate available names to be used.

Of note is that if one factors in the East Coast *U. milii* as a separate taxon to the others, based solely on significant morphological divergence, the molecular results of Oliver and Bauer (2011) indicates that there are at least five separate lineages requiring taxonomic recognition, in addition to the species formally described by Doughty and Oliver (2011), giving a total count for the currently (treated by most as) monotypic genus *Underwoodisaurus* of 6 full species.

Noting that the relevant populations can easily be distinguished on a morphological basis, I therefore name as new species within the *U. milii* complex, the currently unnamed divergent lineages from southern Australia (Victoria, southern inland NSW to the SA/WA border area) and that form from south-west Western Australia near Perth, while recognizing the other named forms (as listed by Wells and Wellington 1985 and that described by Doughty and Oliver 2011) as full species at the same taxonomic level.

This overdue revision of the taxonomy of the *U. milii* group allows scientists to better quantify what taxa they may be studying by referring them to the appropriate species, especially noting that many potential differences between populations are not known at this stage.

Within the main southern Australian group now called *U. mensforthi sp. nov.*, a subspecies *U. mensforthi martinekae subsp. nov.* is also formally named and defined.

In order to maintain order within the Carphodactylidae family group and to properly deal with the expanded number of genera and species within genera, accumulated over recent decades, I have also formally named and defined four appropriate tribes, two divided further, each into two subtribes incorporating correct placements of all known taxa in the family.

The final result in terms of the taxonomy of the family Carphodactylidae outside of the changes indicated herein in terms of tribes, subtribes, genera, subgenera, species and subspecies is otherwise in accordance with that published by Cogger (2014), save for the additional recognition of the species formally described as "*Saltuarius eximius* Hoskin and Couper, 2013", which was missed by Cogger (2014), presumably because the description's publication date superseded the manuscript cut-off date for pre-publication of Cogger (2014). That species taxon has herein been retained in the subgenus *Saltuarius* on the basis of the author's statement "12S/cyt-b mtDNA data places *S. eximius sp. nov.* as a divergent (9.1%) sister-species to *S. cornutus*" as well as the morphological similarities between this taxon and *S. cornutus* combined with the geographical proximity of the allopatric species.

The literature that was relied upon in order to form the entirety of the taxonomic and nomenclatural judgements within (in addition to the obvious morphological evidence) include: Akeret (2013), Annable (1998), Anthony (1998), Arth and Baus (2012), Barrett (1950), Barts and Hulbert (2004), Bauer (1990, 1994, 1999, 2013), Bauer and Henle (1994), Bory de Saint-Vincent (1825), Boulenger (1885, 1886, 1913), Broom (1898), Brygoo (1991), Cogger (2014), Cogger *et al.* (2013), Couper (1994), Couper and Gregson (1994), Couper and Hoskin (2013), Couper, Covacevich and Moritz (1993, 1997, 2000, 2008a, 2008b), Covacevich (1971, 1975), Daza and Bauer (2012), Delean and Harvey (1983), de Vis (1886), Dizier and Wret (2010), Doughty and Oliver (2011), Doughty and Shine (1995), Driscoll *et al.* (2012), Duméril and Bibron (1836), Duscha (2007), Even (2005), Fallend (2007), Ferguson *et al.* (2015), Fitzinger (1826), Ford (1963), Galliford (1981), Garman (1901), Goldfuss (1820), Gray (1825, 1845, 1867), Günther (1876, 1897), Harvey (1983), Hoser (1989), Hoskin and Couper (2013), Hoskin *et al.* (2003), How *et al.* (1991), Ijzendoorn (2007), Kay *et al.* (2013), Kinghorn (1931), Kluge (1991, 1993), LaCépède (1804), Langner (2005), Laube (2001, 2002, 2006, 2007), Laube and Langner (2007a, 2007b, 2013), Laube and Porter (2004), LiVigni (2013), Longman (1918), Love (2010, 2012, 2014), Loveridge (1932, 1934, 1947), Merrem (1820), Mertens (1958, 1967), Mo (2014, 2015), Moritz *et al.* (1993), Ogilby (1892), Oliver and Bauer (2011), Pianka (1969), Pianka and Vitt (2003), Porter (2002), Read (1998), Ride *et al.* (1999), Rochebrune (1884), Rösler (1985, 1995, 2000), Rudge (2004), Schenk (2009), Schinz (1822), Schneider (1797), Schönecker (2007), Shaw and Nodder (1791), Schneider (1797), Shea (2002), Shea and Sadlier (1999), Spix (1825), Storr (1963, 1968), Storr *et al.* (1990), Swainson (1839), Swanson (1976), Torr (1998), Underwood (1954), Wells and Wellington (1983, 1985), Wermuth (1965), Werner (2008), White (1790), Wilson and Knowles (1988), Wilson and Swan (2010), Zietz (1920) and sources cited therein.

I also note that, notwithstanding the theft of relevant materials from this author in an illegal armed raid on 17 August 2011, which were not returned in breach of undertakings to the court (Court of Appeal Victoria 2014 and VCAT 2015), I have made a decision to publish this paper.

This is in view of the conservation significance attached to the formal recognition of unnamed taxa and on the basis that further delays may in fact put these unnamed taxa at greater risk of extinction.

This comment is made noting the extensive increase in human population in Australia and the general environmental destruction across the continent as documented by Hoser (1991), including low density areas without a large permenant human population. I also note the abysmal environmental record of Australian governments in the past 200 years as detailed by Hoser (1989, 1991, 1993 and 1996).

The order of descriptions is as follows: Tribes, subtribes, genera and subgenera first, followed by the descriptions of species, then subspecies. The correct placement of the latter is shown in the genus level diagnoses in this paper as well as in the listing published with this paper.

TRIBE CARPHODACTYLINI *TRIBE NOV.*

(Terminal taxon: *Carphodactylus laevis* Günther, 1897)

Diagnosis: The following diagnosis for the tribe is also applicable as a diagnosis for the two defined species in the genus *Carphodactylus*, this genus being monotypic for the tribe. They are separated from all other Australian geckos by the following suite of characters:

Eye is snake-like without movable lids, pupil in daylight is a narrow vertical slit, scales on the dorsal surface are small and juxtaposed but not overlapping. Digits are angular when viewed laterally. Feet are bird like and their terminal claws are conspicuous and free. Postmentals and adjacent gulars subequal. Original tail ending in a tapered tip and without a terminal knob. Claw between five scales. Body is laterally compressed. Rostral and mental shields are rounded. Labials are much larger than adjacent scales. Postmentals and adjacent gulars are subequal. Digits are long, slender and only moderately compressed distally and without enlarged apical subdigital lamellae, but with a single series of slightly swollen transverse lamellae. Preanal pores are present.

Adults have snout vent length of about 13 cm (adapted from Cogger 2014).

Distribution: North-eastern Queensland, Australia in the general region from Tully to Cooktown, Queensland.

Content: *Carphodactylus* Günther, 1897 (monotypic).

GENUS *CARPHODACTYLUS* GÜNTHER, 1897.

Type species: *Carphodactylus laevis* Günther, 1897.

Diagnosis: See the preceding diagnosis for the tribe Carphodactylini *tribe nov.*.

Distribution: North-eastern Queensland, Australia in the general region from Tully to Cooktown, Queensland.

Content: *Carphodactylus laevis* Günther, 1897 (type species); *C. hoserae sp. nov.*.

TRIBE NEPHRURIINI *TRIBE NOV.*

(Terminal taxon: *Nephrurus asper* Günther, 1876)

Diagnosis: The species within Nephruriini *tribe nov.* are separated from all other Carphodactylidae by one of the following two suites of characters: 1/ The (unregenerated) tail ends in a small but distinctive knob (genus *Nephrurus* Günther, 1876), or 2/ The tail does not end in a small but distinctive knob; the claw is between 2 scales, the lower scale may be deeply grooved or even divided to form 3 scales; digits with two rows of lateral scales; tail is swollen without spines and less than twice as broad as thick (genera *Underwoodisaurus* Wermuth, 1965; *Uvidicolus* Oliver and Bauer, 2011).

Underwoodisaurus is separated from *Uvidicolus* by having the anterior loreals minute, granular and strongly differentiated from the posterior loreals, versus the anterior and posterior loreals being more or less subequal, without marked differentiation anteriorly in *Uvidicolus.*

Distribution: Most parts of continental Australia.

Content: *Nephrurus* Günther, 1876; *Underwoodisaurus* Wermuth, 1965; *Uvidicolus* Oliver and Bauer, 2011.

SUBTRIBE *UVIDICOLINA SUBTRIBE NOV.*

(Terminal taxon: *Gymnodactylus sphyrurus* Ogilby, 1892)

Diagnosis: The species within Nephruriini *tribe nov.* are separated from all other Carphodactylidae by one of the following two suites of characters: 1/ The (unregenerated) tail ends in a small but distinctive knob (genus *Nephrurus* Günther, 1876), or 2/ The tail does not end in a small but distinctive knob; the claw is between 2 scales, the lower scale may be deeply grooved or even divided to form 3 scales; digits with two rows of lateral scales; tail is swollen without spines and less than twice as broad as thick (genera *Underwoodisaurus* Wermuth, 1965; *Uvidicolus* Oliver and Bauer, 2011).

Underwoodisaurus is separated from *Uvidicolus,* this latter genus being the totality of the subtribe Uvidicolina *subtribe nov.* by having the anterior loreals minute, granular and strongly differentiated from the posterior loreals, versus the anterior and posterior loreals being more or less subequal, without marked differentiation anteriorly in *Uvidicolus.*

Distribution: Confined to the northern slopes and tablelands of New South Wales and adjacent border regions of southern Queensland in Australia.

Content: *Uvidicolus* Oliver and Bauer, 2011 (monotypic).

GENUS *UVIDICOLUS* OLIVER AND BAUER, 2011.

Type species: *Gymnodactylus sphyrurus* Ogilby, 1892.

Diagnosis: The species within Nephruriini *tribe nov.* are separated from all other Carphodactylidae by one of the following two suites of characters: 1/ The (unregenerated) tail ends in a small but distinctive knob (genus *Nephrurus* Günther, 1876), or 2/ The tail does not end in a small but distinctive knob; the claw is between 2 scales, the lower scale may be deeply grooved or even divided to form 3 scales; digits with two rows of lateral scales; tail is swollen without spines and less than twice as broad as thick (genera *Underwoodisaurus* Wermuth, 1965; *Uvidicolus* Oliver and Bauer, 2011).

Underwoodisaurus is separated from *Uvidicolus,* this latter genus being the totality of the subtribe Uvidicolina *subtribe nov.* by having the anterior loreals minute, granular and strongly differentiated from the posterior loreals, versus the anterior and posterior loreals being more or less subequal, without marked differentiation anteriorly in *Uvidicolus.*

Distribution: Confined to the northern slopes and tablelands of New South Wales and adjacent border regions of southern Queensland in Australia.

Content: *Uvidicolus sphyrurus* (Ogilby, 1892) (type species); *U. covacevichae sp. nov.*

SUBTRIBE NEPHRURIINA *SUBTRIBE NOV.*

(Terminal taxon: *Nephrurus asper* Günther, 1876)

Diagnosis: The species within Nephruriini *tribe nov.* are separated from all other Carphodactylidae by one of the following two suites of characters: 1/ The (unregenerated) tail ends in a small but distinctive knob (genus *Nephrurus* Günther, 1876), or 2/ The tail does not end in a small but distinctive knob; the claw is between 2 scales, the lower scale may be deeply grooved or even divided to form 3 scales; digits with two rows of lateral scales; tail is swollen without spines and less than twice as broad as thick (genera *Underwoodisaurus* Wermuth, 1965; *Uvidicolus* Oliver and Bauer, 2011).

Underwoodisaurus is separated from *Uvidicolus*, the genus *Uvidicolus* being outside of the Nephruriina *subtribe nov.* by having the anterior loreals minute, granular and strongly differentiated from the posterior loreals, versus the anterior and posterior loreals being more or less subequal, without marked differentiation anteriorly in *Uvidicolus.*
Genera *Nephrurus* and *Underwoodisaurus* constitute the entirety of Nephruriina *subtribe nov.*.

Distribution: Most parts of continental Australia.

Content: *Nephrurus* Günther, 1876; *Underwoodisaurus* Wermuth, 1965.

GENUS *NEPHRURUS* GÜNTHER, 1876.

Type species: *Nephrurus asper* Günther, 1876.

Diagnosis: The genus *Nephrurus* is unique among Australian geckos in that the unregenerated tail ends in a small well-defined and distinctive knob. The species are also characterised by large heads and the short fat tails that end with a distinctive knob on the end. Species of *Nephrurus* are invariably dry habitat adapted, but within this environment, they actively seek out cool and moist microhabitats and die easily if overheated. Rostral and mental shields are rounded. Labials are bigger than adjacent scales. Postmentals are not enlarged. Digits are short, round and without enlarged apical subdigital lamellae. They are covered ventrally by numerous small irregular spinose tubercles. All digits have claws and there are no preanal pores.

Lizards in the nominate subgenus *Nephrurus*, are characterised and separated from the other subgenera by the following characters: Scattered tubercles on the flanks each containing several conical scales and eight or more interorbital scales. The surface texture of these geckos is noticeably rough.

Lizards in the subgenus *Paranephrurus subgen. nov.* are characterised and separated from the other subgenera by the following characters: Scattered tubercles on the flanks each containing a single conical scale, less than eight interorbital scales and four or five broad dark bands running across the body and tail. The surface texture of these geckos is moderately rough.

Diagnosis of species within the third subgenus *Quazinephrurus subgen. nov.* can be made simply by a process of elimination of the others. These are generally known as the “Smooth Knob-tailed Geckos” as opposed to the other subgenera have species that are “Rough” in texture and appearance, although their texture is not completely smooth. They are however extremely smooth when compared to those in the other subgenera.

Alternatively, the species within *Quazinephrurus subgen. nov.* are characterised and separated from the other subgenera by the following characters: Flanks smooth and without tubercles or with scattered tubercles, which if present each contain a single conical scale; fewer than eight interorbital scales; no broad, dark transverse bands; if transverse bands are present, they are narrow, pale and irregular on a darker ground colour.

The species within Nephruriini *tribe nov.* are separated from all other Carphodactylidae by one of the following two suites of characters: 1/ The (unregenerated) tail ends in a small but distinctive knob (genus *Nephrurus* Günther, 1876), or 2/ The tail does not end in a small but distinctive knob; the claw is between 2 scales, the lower scale may be deeply grooved or even divided to form 3 scales; digits with two rows of lateral scales; tail is swollen without spines and less than twice as broad as thick (genera *Underwoodisaurus* Wermuth, 1965; *Uvidicolus* Oliver and Bauer, 2011).

Underwoodisaurus is separated from *Uvidicolus*, the genus *Uvidicolus* being outside of the Nephruriina *subtribe nov.* by having the anterior loreals minute, granular and strongly differentiated from the posterior loreals, versus the anterior and posterior loreals being more or less subequal, without marked differentiation anteriorly in *Uvidicolus.*

Genera *Nephrurus* and *Underwoodisaurus* constitute the entirety of Nephruriina *subtribe nov.*.

Distribution: Drier parts of continental Australia including the tropics, but not including colder regions in the far south-east.

Content: *Nephrurus* (*Nephrurus*) *asper* Günther, 1876 (type species); *N.* (*Nephrurus*) *amyae* Couper, 1994; *N.* (*Nephrurus*) *blacki sp. nov.*; *N.* (*Paranephrurus*) *cinctus* Storr, 1963; *N.* (*Quazinephrurus*) *coreyrentoni sp. nov.*; *N.* (*Quazinephrurus*) *deleani* Harvey, 1983; *N.* (*Quazinephrurus*) *ianrentoni sp. nov.*; *N.* (*Quazinephrurus*) *laevissimus* Mertens, 1958; *Nephrurus* (*Quazinephrurus*) *levis* De Vis, 1886; *N.* (*Quazinephrurus*) *occidentalis* Storr, 1963; *N.* (*Nephrurus*) *sheai* Couper, 1994; *N.* (*Quazinephrurus*) *stellatus* Storr, 1968; *N.* (*Quazinephrurus*) *vertebralis* Storr, 1963; *Nephrurus* (*Paranephrurus*) *wheeleri* Loveridge, 1932.

SUBGENUS *NEPHRURUS* GÜNTHER, 1876.

Type species: *Nephrurus asper* Günther, 1876.

Diagnosis: Refer to the preceding description for the genus *Nephrurus* Günther, 1876 for the diagnosis of this subgenus as well.

Distribution: Drier parts of continental Australia including the tropics, but not including colder regions in the far south-east.

Content: *Nephrurus* (*Nephrurus*) *asper* Günther, 1876 (type species); *N.* (*Nephrurus*) *amyae* Couper, 1994; *N.* (*Nephrurus*) *blacki sp. nov.*; *N.* (*Nephrurus*) *sheai* Couper, 1994.

SUBGENUS *QUAZINEPHRURUS SUBGEN. NOV.*

Type species: *Nephrurus levis* De Vis, 1886.

Diagnosis: The gecko species within *Quazinephrurus subgen. nov.* are characterised and separated from the other subgenera by the following characters: Flanks smooth and without tubercles or with scattered tubercles, which if present each contain a single conical scale; fewer than eight interorbital scales; no broad, dark transverse bands or if transverse bands are present, they are narrow, pale and irregular on a darker ground colour.

The genus *Nephrurus* is unique among Australian geckos in that the unregenerated tail ends in a small well-defined and distinctive knob. The species are also characterised by large heads and the short fat tails that end with a distinctive knob on the end. Species of *Nephrurus* are invariably dry habitat adapted, but within this environment, they actively seek out cool and moist microhabitats and die easily if overheated. Rostral and mental shields are rounded. Labials are bigger than adjacent scales. Postmentals are not enlarged. Digits are short, round and without enlarged apical subdigital lamellae. They are covered ventrally by numerous small irregular spinose tubercles. All digits have claws and there are no preanal pores.

Lizards in the nominate subgenus *Nephrurus*, are characterised and separated from the other subgenera by the following characters: Scattered tubercles on the flanks each containing several conical scales and eight or more interorbital scales. The surface texture of these geckos is noticeably rough.

Lizards in the subgenus *Paranephrurus subgen. nov.* are characterised and separated from the other subgenera by the following characters: Scattered tubercles on the flanks each containing a single conical scale, less than eight interorbital scales and four or five broad dark bands running across the body and tail. The surface texture of these geckos is moderately rough.

Diagnosis of species within the third subgenus *Quazinephrurus subgen. nov.* can also be made simple by a process of elimination of the others. These are generally known as the "Smooth Knob-tailed Geckos" as opposed to the other subgenera have species that are "Rough" in texture and appearance, although their texture is not completely smooth. They are however extremely smooth when compared to those in the other subgenera.

The species within Nephruriini *tribe nov.* are separated from all other Carphodactylidae by one of the following two suites of characters: 1/ The (unregenerated) tail ends in a small but distinctive knob (genus *Nephrurus* Günther, 1876), or 2/ The tail does not end in a small but distinctive knob; the claw is between 2 scales, the lower scale may be deeply grooved or even divided to form 3 scales; digits with two rows of lateral scales; tail is swollen without spines and less than twice as broad as thick (genera *Underwoodisaurus* Wermuth, 1965; *Uvidicolus* Oliver and Bauer, 2011).

Underwoodisaurus is separated from *Uvidicolus*, the genus *Uvidicolus* being outside of the Nephruriina *subtribe nov.* by having the anterior loreals minute, granular and strongly differentiated from the posterior loreals, versus the anterior and posterior loreals being more or less subequal, without marked differentiation anteriorly in *Uvidicolus.*

Distribution: Drier parts of continental Australia including the tropics, but not including colder regions in the far south west or south-east.

Etymology: Named "Quazi" as in "nearly" in conjunction with the subgenus it is most similar to, namely "*Nephrurus*".

Content: *Nephrurus* (*Quazinephrurus*) *levis* De Vis, 1886 (type species); *N.* (*Quazinephrurus*) *coreyrentoni sp. nov.*; *N.* (*Quazinephrurus*) *deleani* Harvey, 1983; *N.* (*Quazinephrurus*) *ianrentoni sp. nov.*; *N.* (*Quazinephrurus*) *laevissimus* Mertens, 1958; *N.* (*Quazinephrurus*) *occidentalis* Storr, 1963; *N.* (*Quazinephrurus*) *stellatus* Storr, 1968; *N.* (*Quazinephrurus*) *vertebralis* Storr, 1963.

SUBGENUS *PARANEPHRURUS SUBGEN. NOV.*

Type species: *Nephrurus wheeleri* Loveridge, 1932.

Diagnosis: Lizards in the subgenus *Paranephrurus subgen. nov.* are characterised and separated from the other subgenera by the following characters: Scattered tubercles on the flanks each containing a single conical scale, less than eight interorbital scales and four or five broad dark bands running across the body and tail. The surface texture of these geckos is moderately rough.

Lizards in the nominate subgenus *Nephrurus*, are characterised and separated from the other subgenera by the following characters: Scattered tubercles on the flanks each containing several conical scales and eight or more interorbital scales. The surface texture of these geckos is noticeably rough.

Diagnosis of species within the third subgenus *Quazinephrurus subgen. nov.* can be made simple by a process of elimination of the others. These are generally known as the "Smooth Knob-tailed Geckos" as opposed to the other subgenera have species that are "Rough" in texture and appearance, although their texture is not completely smooth. They are however extremely smooth when compared to those in the other subgenera.

Alternatively, the species within *Quazinephrurus subgen. nov.* are characterised and separated from the other subgenera by the following characters: Flanks smooth and without tubercles or with scattered tubercles, which if present each contain a single conical scale; fewer than eight interorbital scales; no broad, dark transverse bands; if transverse bands are present, they are narrow, pale and irregular on a darker ground colour.

The genus *Nephrurus* is unique among Australian geckos in that the unregenerated tail ends in a small well-defined and distinctive knob. The species are also characterised by large heads and the short fat tails that end with a distinctive knob on the end. Species of *Nephrurus* are invariably dry habitat adapted, but within this environment, they actively seek out cool and moist microhabitats and die easily if overheated. Rostral and mental shields are rounded. Labials are bigger than adjacent scales. Postmentals are not enlarged. Digits are short, round and without enlarged apical subdigital lamellae. They are covered ventrally by numerous small irregular spinose tubercles. All digits have claws and there are no preanal pores.

The species within Nephruriini *tribe nov.* are separated from all other Carphodactylidae by one of the following two suites of characters: 1/ The (unregenerated) tail ends in a small but distinctive knob (genus *Nephrurus* Günther, 1876), or 2/ The tail does not end in a small but distinctive knob; the claw is between 2 scales, the lower scale may be deeply grooved or even divided to form 3 scales; digits with two rows of lateral scales; tail is swollen without spines and less than twice as broad as thick (genera *Underwoodisaurus* Wermuth, 1965; *Uvidicolus* Oliver and Bauer, 2011).

Underwoodisaurus is separated from *Uvidicolus*, the genus *Uvidicolus* being outside of the Nephruriina *subtribe nov.* by having the anterior loreals minute, granular and strongly differentiated from the posterior loreals, versus the anterior and posterior loreals being more or less subequal, without marked differentiation anteriorly in *Uvidicolus.*
Genera *Nephrurus* and *Underwoodisaurus* constitute the entirety of Nephruriina *subtribe nov.*.

Distribution: *Paranephrurus subgen. nov.* is confined to the Murchison District and Fortescue River District, entirely within Western Australia.

Etymology: Named “Para” as in “not quite” in conjunction with the subgenus it is most similar to, namely “*Nephrurus*”.

Content: *Nephrurus* (*Paranephrurus*) *wheeleri* Loveridge, 1932 (type species); *N.* (*Paranephrurus*) *cinctus* Storr, 1963.

GENUS *UNDERWOODISAURUS* WERMUTH, 1965.

Type species: *Phyllurus milii* Bory de Saint-Vincent, 1825.

Diagnosis: The species within Nephruriini *tribe nov.* are separated from all other Carphodactylidae by one of the following two suites of characters: 1/ The (unregenerated) tail ends in a small but distinctive knob (genus *Nephrurus* Günther, 1876), or 2/ The tail does not end in a small but distinctive knob; the claw is between 2 scales, the lower scale may be deeply grooved or even divided to form 3 scales; digits with two rows of lateral scales; tail is swollen without spines and less than twice as broad as thick (genera *Underwoodisaurus* Wermuth, 1965; *Uvidicolus* Oliver and Bauer, 2011).

Underwoodisaurus is separated from *Uvidicolus*, the genus *Uvidicolus* being outside of the Nephruriina *subtribe nov.* and monotypic for the other subtribe by having the anterior loreals minute, granular and strongly differentiated from the posterior loreals, versus the anterior and posterior loreals being more or less subequal, without marked differentiation anteriorly in *Uvidicolus.*
Genera *Nephrurus* and *Underwoodisaurus* constitute the entirety of Nephruriina *subtribe nov.*.

Distribution: Most parts of the southern half of continental Australia, extending north in the far west, centre and far east.

Content: *Underwoodisaurus milii* (Bory de Saint-Vincent, 1825) (type species); *U. asper* (Boulenger, 1913); *U. husbandi* Wells and Wellington (1983); *U. mensforthi sp. nov.*; *U. perthensis sp. nov.*; *U. seorsus* Doughty and Oliver, 2011.

TRIBE ORRAYINI *TRIBE NOV.*

(Terminal taxon: *Saltuarius occultus* Couper, Covacevich and Moritz, 1993)

Diagnosis: The following diagnosis for the tribe is also applicable as a diagnosis for the single defined type species monotypic for the genus *Orraya* Couper, Covacevich, Schneider and Hoskin, 2000, this being the only genus in the tribe. They are separated from all Australian geckos by the following suite of characters:

Eye is snake-like without movable lids, pupil in daylight is a narrow vertical slit, scales on the dorsal surface are small and juxtaposed but not overlapping. Digits are angular when viewed laterally. Feet are bird like and their terminal claws are conspicuous and free. Digits are long, slender and moderately compressed with three or more rows of lateral scales. The base of each claw between two scales and deeply notched. No enlarged apical subdigital lamellae, but with a single series of slightly swollen transverse lamellae. Postmentals and adjacent gulars subequal. Tail ends in a tapered tip. Three lumbar (rib free) vertebrae, versus 2 in all other Australian leaf-tailed geckos of the tribe Shireengeckiini *tribe nov.*. The (original) tail is broad and flat and about twice as long as broad. Rostral scale contacts the nostril. Preanal pores are usually present in males. Neck is distinctly slender and elongate. Preanal pores are present in males. In common with Shireengeckiini *tribe nov.*. the rostral and mental shields are rounded. Labials are larger than the adjacent scales. Postmentals and adjacent gulars are subequal.

Distribution: McIlwraith Range , Cape York Peninsula, Queensland, Australia.

Content: *Orraya* Couper, Covacevich, Schneider and Hoskin, 2000 (monotypic).

GENUS *ORRAYA* COUPER, COVACEVICH, SCHNEIDER AND HOSKIN, 2000.

Type species: *Saltuarius occulta* Couper, Covacevich and Moritz, 1993.

Diagnosis: See the preceding diagnosis for the tribe Orrayini *tribe nov.*

Distribution: Known only from the McIlwraith Range, Cape York Peninsula, Queensland, Australia.

Content: *Orraya occulta* (Couper, Covacevich and Moritz, 1993) (monotypic).

TRIBE SHIREENGECKIINI *TRIBE NOV.*

(Terminal taxon: *Saltuarius wyperba* Couper, Schneider and Covacevich, 1997)

Diagnosis: Eye is snake-like without movable lids, pupil in daylight is a narrow vertical slit, scales on the dorsal surface are small and juxtaposed but not overlapping.

Digits are angular when viewed laterally. Feet are bird like and their terminal claws are conspicuous and free. Postmentals and adjacent gulars subequal. Original tail is broad, heart or leaf shaped and flattened and with spines, or usually without in regenerated tails. Claw between 2 scales, the lower deeply notched. Digits are compressed with three or more rows of lateral scales. Neck is not distinctly slender and elongate. Body not laterally compressed, but instead flattened. Two lumbar (rib free) vertebrae, versus 3 in geckos from the tribe Orrayini *tribe nov.*.

Distribution: Wetter coastal regions from about Sydney, New South Wales, to far north Queensland, Australia.

Content: *Shireengecko gen. nov.*; *Couperus gen. nov.*; *Oxygecko gen. nov.*; *Phyllurus* Schinz, 1822; *Saltuarius* Couper, Covacevich and Moritz, 1993; *Teesgecko gen. nov.*.

SUBTRIBE OXYGECKOINA *SUBTRIBE NOV.*

(Terminal taxon: *Phyllurus amnicola* Hoskin, Couper, Schneider and Covacevich, 2000)

Diagnosis: *Oxygeckoina subtribe nov.* is separated from the other subtribe Shireengeckiina *subtribe nov.* by the rostral scale not contacting the nostril (versus in contact with the nostril in Shireengeckiina *subtribe nov.* and the tribe Orrayini *tribe nov.*) and no preanal pores, (versus usually present in both Shireengeckiina *subtribe nov.* and the tribe Orrayini *tribe nov.*).

The tribe Shireengeckiini *tribe nov.* is defined as follows: Eye is snake-like without movable lids, pupil in daylight is a narrow vertical slit, scales on the dorsal surface are small and juxtaposed but not overlapping.

Digits are angular when viewed laterally. Feet are bird like and their terminal claws are conspicuous and free. Postmentals and adjacent gulars subequal. Original tail is broad, heart or leaf shaped and flattened and with spines, or usually without in regenerated tails. Claw between 2 scales, the lower deeply notched. Digits are compressed with three or more rows of lateral scales. Neck is not distinctly slender and elongate. Body not laterally compressed, but instead flattened. Two lumbar (rib free) vertebrae, versus 3 in geckos from the tribe Orrayini *tribe nov.*.

Distribution: Hilly coastal areas with rocks, wet forests or both in the general range between Townsville, North Queensland and Sydney, New South Wales. Most species known have very limited distributions and appear to have low mobility.

Content: *Oxygecko gen. nov.*; *Couperus gen. nov.*; *Phyllurus* Schinz, 1822; *Teesgecko gen. nov.*.

GENUS *OXYGECKO GEN. NOV.*

Type species: *Phyllurus amnicola* Hoskin, Couper, Schneider and Covacevich, 2000.

Diagnosis: This genus is separated from all other *Phyllurus sensu lato* (this also including the genera *Phyllurus* Schinz, 1822, *Couperus gen. nov.* and *Teesgecko gen. nov.*) by the following suite of characters, these being one or other of: 1/ The tail is slightly depressed to more or less cylindrical in section along its length and the rostral is only partially divided (*O. gulbaru*), or 2/ The rostral is partially divided by at most a single groove; the tail is moderately to strongly depressed and broadly oval in section anteriorly; the original (but not regrown) tails have distinct narrow white or cream cross-bands (sometimes as incomplete transversely aligned white blotches), at least anteriorly; there is a lateral fold between the axilla and groin, with a series of long curved, spinose tubercles which are surrounded by a rosette of smaller tubercles which are distinctly larger than the adjacent scales; the belly is either white or off-white; 5-6 scales along the upper margin of the rostral scale (O. *amnicola*).

Distribution: The hills in the vicinity of Townsville, North Queensland, Australia, specifically known from Mount Elliott (O. *amnicola*) and the Paluma Range (*O. gulbaru*).

Etymology: Named in honour of the family pet dog, a Great Dane, named Oxyuranus or “Oxy” for short, who over an 8 year period guarded the family home and vulnerable young children from people seeking to undermine our vital conservation work as a result of their own nefarious commercial objectives.

Oxyuranus Kinghorn, 1923 is a genus name for a highly venomous group of elapid snakes.

Content: *Oxygecko amnicola* (Hoskin, Couper, Schneider and Covacevich, 2000) (type species); *O. gulbaru* (Hoskin, Couper and Schneider, 2003).

GENUS *COUPERUS GEN. NOV.*

Type species: *Phyllurus caudiannulatus* Covacevich, 1975.

Diagnosis: The genus *Couperus gen. nov.* is separated from all other *Phyllurus sensu lato* (this also including the genera *Phyllurus* Schinz, 1822, *Oxygecko gen. nov.* and *Teesgecko gen. nov.*) by the following suite of characters: The tail is slightly depressed to more or less cylindrical in section along its length and the rostral is fully divided.

The two species are divided as follows: One or other of: 1/ The lower surfaces of the hindlimbs are covered by uniformly small, granular scales with scattered raised tubercles (*C. caudiannulatus*), or, 2/ The lower surfaces of the hindlimbs are covered by uniformly small, granular scales but without scattered raised tubercles (*C. kabikabi*).

Distribution: Dawes and Many Peaks Ranges, near Monto, South-east Queensland (*C. caudiannulatus*), or Oakview Forest Reserve, near Gympie, South-east Queensland (*C. kabikabi*).

Etymology: Named in honour of Partick Couper, reptile curator at the Queensland Museum, Brisbane, Queensland, Australia in recognition of his work with reptiles spanning some decades.

Content: *Couperus caudiannulatus* (Covacevich, 1975); *C. kabikabi* (Couper, Hamley and Hoskin, 2008).

GENUS *PHYLLURUS* SCHINZ, 1822.

Type species: *Phyllurus novaehollandiae* Schinz, 1822.
(A junior synonym for *Lacerta platura* White, 1790)

Diagnosis: This genus, *Phyllurus sensu stricto* (as defined herein) is separated from all other *Phyllurus sensu lato* (this also including the genera *Oxygecko gen. nov.*, *Couperus gen. nov.* and *Teesgecko gen. nov.*) by the following suite of characters: The rostral is partially divided by at most a single groove; the tail is moderately to strongly depressed and broadly oval in section anteriorly; the original and regrown tails are always lacking white cross bands; there is a lateral fold between the axilla and groin, with a few low, rounded tubercles; conical tubercles on the flanks are surrounded by scales which are scarcely or not differentiated from those adjacent to them.

Distribution: Central coast and ranges of New South Wales in association with the Hawkesbury/Nepean Sandstone formations of the Sydney basin.

Content: *Phyllurus platurus* (White ex Shaw, 1790) (monotypic at present).

GENUS *TEESGECKO GEN. NOV.*

Type species: *Phyllurus nepthys* Couper, Covacevich and Moritz, 1993.

Diagnosis: This genus, *Teesgecko gen. nov.* is separated from all other *Phyllurus sensu lato* (this including the genera *Phyllurus* Schinz, 1822, *Oxygecko gen. nov.* and *Couperus gen. nov.*) by the following suite of characters: The tail is moderately to strongly depressed and broadly oval in section anteriorly. the original (but not regrown) tails have distinct narrow white or cream cross-bands (sometimes as incomplete transversely aligned white blotches), at least anteriorly; there is a lateral fold between the axilla and groin, with a series of long curved, spinose tubercles which are surrounded by a rosette of smaller tubercles which are distinctly larger than the adjacent scales and one or other of the following four suites of additional characters: 1/ The belly is noticeably peppered with brown (*T. nepthys*) or 2/ The belly is usually uniformly white or off white and the rostral scale is usually completely divided (*T. championae*), or 3/ The belly is usually uniformly white or off white and the rostral scale is usually only partly divided, being partially divided by two or three grooves, or by a single Y-shaped groove (*T. ossa*), or 4/ The belly is usually uniformly white or off white and the rostral scale is usually only partly divided, being partially divided by at most a single groove and 9-11 scales along the upper margin of the rostral scale (*T. isis*).

Distribution: Hills and mountains in the general region of Proserpine/Mackay, on the coast of central to north-east Queensland, Australia, with most species having a very limited known range.

Etymology: Named in honour of Sydney-based lawyer Alex Tees, from Bondi, New South Wales, Australia in recognition of his significant contributions to wildlife conservation and human rights issues in Australia, including securing the end of the illegal ban imposed by the New South Wales National Parks and Wildlife Service (NPWS) on sales of the book, *Smuggled-2: Wildlife Trafficking, Crime and Corruption in Australia*, at end 1996.

It was the successful publication of that book and the earlier

Smuggled: The Underground Trade in Australia's Wildlife in 1993 (Hoser 1993, 1996) that finally ended a 20 year ban by Australian governments on the lawful right of private individuals to be able to catch, keep or study reptiles and most other kinds of wildlife.

The contribution Tees made to removing these anti-conservation laws was significant, and all animal lovers, wildlife conservationists and herpetologists owe this man a deep debt of gratitude.

Content: *Teesgecko nepthys* (Couper, Covacevich and Moritz, 1993) (type species); *T. championae* (Schneider, Couper, Hoskin and Covacevich, 2000); *T. isis* (Couper, Covacevich and Moritz, 1993); *T. ossa* (Couper, Covacevich and Moritz, 1993).

SUBTRIBE SHIREENGECKIINA *SUBTRIBE NOV.*

(Terminal taxon: *Saltuarius wyperba* Couper, Schneider and Covacevich, 1997)

Diagnosis: *Oxygeckoina subtribe nov.* is separated from the other subtribe Shireengeckiina *subtribe nov.* by the rostral scale not contacting the nostril (versus in contact with the nostril in Shireengeckiina *subtribe nov.* and the tribe Orrayini *tribe nov.*) and no preanal pores, (versus usually present in both Shireengeckiina *subtribe nov.* and the tribe Orrayini *tribe nov.*).

The tribe Shireengeckiini *tribe nov.* is defined as follows: Eye is snake-like without movable lids, pupil in daylight is a narrow vertical slit, scales on the dorsal surface are small and juxtaposed but not overlapping.

Digits are angular when viewed laterally. Feet are bird like and their terminal claws are conspicuous and free. Postmentals and adjacent gulars subequal. Original tail is broad, heart or leaf shaped and flattened and with spines, or usually without in regenerated tails. Claw between 2 scales, the lower deeply notched. Digits are compressed with three or more rows of lateral scales. Neck is not distinctly slender and elongate. Body not laterally compressed, but instead flattened. Two lumbar (rib free) vertebrae, versus 3 in geckos from the tribe Orrayini *tribe nov.* (which also separates the subtribe Shireengeckiina *subtribe nov.* from the tribe Orrayini *tribe nov.*).

Distribution: Scattered localities along the East Coast of Australia from Cape York in Queensland, south to northern New South Wales, in wetter parts of the coast and nearby ranges.

Content: *Shireengecko gen. nov.*; *Saltuarius* Couper, Covacevich and Moritz, 1993.

GENUS *SALTUARIUS* COUPER, COVACEVICH AND MORITZ, 1993.

Type species: *Gymnodactylus cornutus* Ogilby, 1892.

Diagnosis: Within the subtribe Shireengeckiina *subtribe nov.* the genus *Saltuarius* Couper, Covacevich and Moritz, 1993 is separated from *Shireengecko gen. nov.* (the other genus in the subtribe) by one or other of the following suites of characters: 1/ The throat is smooth or with a few scattered tubercles; pre-anal pores are present only in the males; there are long recurved flank spines each sitting in a rosette of enlarged basal scales (subgenus *Saltuarius*), or 2/ The throat has numerous scattered tubercles and pre-anal pores are present in both sexes (subgenus *Quazisaltuarius subgen. nov.*).

Oxygeckoina subtribe nov. is separated from the other subtribe Shireengeckiina *subtribe nov.* by the rostral scale not contacting the nostril (versus in contact with the nostril in Shireengeckiina *subtribe nov.* and the tribe Orrayini *tribe nov.*) and no preanal pores, (versus usually present in both Shireengeckiina *subtribe nov.* and the tribe Orrayini *tribe nov.*).

The tribe Shireengeckiini *tribe nov.* is defined as follows: Eye is snake-like without movable lids, pupil in daylight is a narrow vertical slit, scales on the dorsal surface are small and juxtaposed but not overlapping.

Digits are angular when viewed laterally. Feet are bird like and their terminal claws are conspicuous and free. Postmentals and adjacent gulars subequal. Original tail is broad, heart or leaf shaped and flattened and with spines, or usually without in regenerated tails. Claw between 2 scales, the lower deeply notched. Digits are compressed with three or more rows of lateral scales. Neck is not distinctly slender and elongate. Body not laterally compressed, but instead flattened. Two lumbar (rib free) vertebrae, versus 3 in geckos from the tribe Orrayini *tribe nov.* (which also separates the subtribe Shireengeckiina *subtribe nov.* from the tribe Orrayini *tribe nov.*).

Distribution: The wet tropics of North Queensland, Australia (subgenus *Saltuarius*), or mid-eastern Queensland in the ranges west and south-west of Rockhampton, including the Blackdown Tableland and Dawes Range areas (subgenus *Quazisaltuarius subgen. nov.*).

Content: *Saltuarius* (*Saltuarius*) *cornutus* (Ogilby, 1892) (type species); *S.* (*Saltuarius*) *adelynae sp. nov.*; *S.* (*Saltuarius*) *eximius* Hoskin and Couper, 2013; *S.* (*Quazisaltuarius*) *jackyae sp. nov.*; *S.* (*Quazisaltuarius*) *salebrosus* (Covacevich, 1975).

SUBGENUS *QUAZISALTUARIUS SUBGEN. NOV.*

Type species: *Phyllurus salebrosus* Covacevich, 1975.

Diagnosis: Within the subtribe Shireengeckiina *subtribe nov.* the genus *Saltuarius* Couper, Covacevich and Moritz, 1993 is separated from *Shireengecko gen. nov.* (the other genus in the subtribe) by one or other of the following suites of characters: 1/ The throat has numerous scattered tubercles and pre-anal pores are present in both sexes (subgenus *Quazisaltuarius subgen. nov.*), or 2/ The throat is smooth or with a few scattered tubercles; pre-anal pores are present only in the males; there are long recurved flank spines each sitting in a rosette of enlarged basal scales (subgenus *Saltuarius*).

Oxygeckoina subtribe nov. is separated from the other subtribe Shireengeckiina *subtribe nov.* by the rostral scale not contacting the nostril (versus in contact with the nostril in Shireengeckiina *subtribe nov.* and the tribe Orrayini *tribe nov.*) and no preanal pores, (versus usually present in both Shireengeckiina *subtribe nov.* and the tribe Orrayini *tribe nov.*).

The tribe Shireengeckiini *tribe nov.* is defined as follows: Eye is snake-like without movable lids, pupil in daylight is a narrow vertical slit, scales on the dorsal surface are small and juxtaposed but not overlapping.

Digits are angular when viewed laterally. Feet are bird like and their terminal claws are conspicuous and free. Postmentals and adjacent gulars subequal. Original tail is broad, heart or leaf shaped and flattened and with spines, or usually without in regenerated tails. Claw between 2 scales, the lower deeply notched. Digits are compressed with three or more rows of lateral scales. Neck is not distinctly slender and elongate. Body not laterally compressed, but instead flattened. Two lumbar (rib free) vertebrae, versus 3 in geckos from the tribe Orrayini *tribe nov.* (which also separates the subtribe Shireengeckiina *subtribe nov.* from the tribe Orrayini *tribe nov.*).

Distribution: The subgenus *Quazisaltuarius subgen. nov.* occurs in mid-eastern Queensland in the ranges west and south-west of Rockhampton, including the Blackdown Tableland and Dawes Range areas.

The subgenus *Saltuarius* is found in the wet tropics of North Queensland, Australia.

Etymology: Named "Quazi" as in "nearly" in conjunction with the subgenus it is most similar to, namely "*Saltuarius*".

Content: *S.* (*Quazisaltuarius*) *jackyae sp. nov.*; *S.* (*Quazisaltuarius*) *salebrosus* (Covacevich, 1975).

SUBGENUS *SALTUARIUS* COUPER, COVACEVICH AND MORITZ, 1993.

Type species: *Gymnodactylus cornutus* Ogilby, 1892.

Diagnosis: Refer to the preceding description for the subgenus *Quazisaltuarius subgen. nov.* for the diagnosis of this subgenus as well.

Distribution: The distribution for the subgenus *Saltuarius* is restricted to the wet tropics of North Queensland, Australia. The subgenus *Quazisaltuarius subgen. nov.* is found in mid-eastern Queensland in the ranges west and south-west of Rockhampton, including the Blackdown Tableland and Dawes Range areas.

Content: *Saltuarius* (*Saltuarius*) *cornutus* (Ogilby, 1892) (type species); *S.* (*Saltuarius*) *adelynae sp. nov.*; *S.* (*Saltuarius*) *eximius* Hoskin and Couper, 2013.

GENUS *SHIREENGECKO GEN. NOV.*

Type species: *Saltuarius wyperba* Couper, Schneider and Covacevich, 1997.

Diagnosis: Within the subtribe Shireengeckiina *subtribe nov.* the genus *Saltuarius* Couper, Covacevich and Moritz, 1993 is separated from *Shireengecko gen. nov.* (the other genus in the subtribe) by one or other of the following suites of characters: 1/ The throat is smooth or with a few scattered tubercles; pre-anal pores are present only in the males; there are long recurved flank spines each sitting in a rosette of enlarged basal scales (subgenus *Saltuarius*), or 2/ The throat has numerous scattered tubercles and pre-anal pores are present in both sexes (subgenus *Quazisaltuarius subgen. nov.*).

The genus *Shireengecko gen. nov.* is also characterised and separated from other genera in the tribe Shireengeckiini *tribe nov.* by the following suite of characters: The throat is smooth or with a few scattered tubercles; pre-anal pores are only present in males; simple enlarged spinose flank scales sit in a rosette of flat scales which are not enlarged.

The subgenus *Quazishireengecko subgen. nov.* monotypic for the species S. (*Quazishireengecko*) *swaini* (Wells and Wellington, 1985), is separated from the nominate subgenus (all other species in the genus), by the following characters: the rostril shield is usually in contact with the nostril; the upper surfaces of the digits have spinose tubercles; the scales on the snout have conspicous scattered and enlarged scales or granules among the smaller scales above the supralabials. Conversely *Shireengecko subgen. nov.* are diagnosed and separated from *Quazishireengecko subgen. nov.* by the fact that the scales on the snout usually grade evenly and without scattered or enlarged scales or granules above the supralabials, or if this is not the case, by the rostral shield being excluded from the nostril and the upper surfaces of the digits lack spinose tubercles.

Oxygeckoina subtribe nov. is separated from the other subtribe Shireengeckiina *subtribe nov.* by the rostral scale not contacting the nostril (versus in contact with the nostril in Shireengeckiina *subtribe nov.* and the tribe Orrayini *tribe nov.*) and no preanal pores, (versus usually present in both Shireengeckiina *subtribe nov.* and the tribe Orrayini *tribe nov.*).

The tribe Shireengeckiini *tribe nov.* is defined as follows: Eye is snake-like without movable lids, pupil in daylight is a narrow vertical slit, scales on the dorsal surface are small and juxtaposed but not overlapping.

Digits are angular when viewed laterally. Feet are bird like and their terminal claws are conspicuous and free. Postmentals and adjacent gulars subequal. Original tail is broad, heart or leaf shaped and flattened and with spines, or usually without in regenerated tails. Claw between 2 scales, the lower deeply notched. Digits are compressed with three or more rows of lateral scales. Neck is not distinctly slender and elongate. Body not laterally compressed, but instead flattened. Two lumbar (rib free) vertebrae, versus 3 in geckos from the tribe Orrayini *tribe nov.* (which also separates the subtribe Shireengeckiina *subtribe nov.* from the tribe Orrayini *tribe nov.*).

Distribution: *Shireengecko gen. nov.* are found in the ranges immediately north and south of the New South Wales and Queensland border, eastern Australia. *Shireengecko subgen. nov.* are generally found south of the border and *Quazishireengecko subgen. nov.* generally north.

Etymology: Named in honour of my wife, Shireen Hoser, in recognition of some decades of work in the wildlife conservation space. Unless mandated under rules of the *International Code of Zoological Nomenclature*, the spelling of the generic names *Shireengecko gen. nov.* or *Quazishireengecko subgen. nov.* should not be altered in any way.

Content: *Shireengecko* (*Shireengecko*) *wyperba* Couper, Schneider and Covacevich, 1997 (type species); *S.* (*Shireengecko*) *kateae* (Couper, Sadlier, Shea and Worthington Wilmer, 2008); *S.* (*Shireengecko*) *moritzi* (Couper, Sadlier, Shea and Worthington Wilmer, 2008); *S.* (*Quazishireengecko*) *swaini* *(*Wells and Wellington, 1985)

SUBGENUS *QUAZISHIREENGECKO SUBGEN. NOV.*

Type species: *Phyllurus swaini* Wells and Wellington, 1985.

Diagnosis: Within the subtribe Shireengeckiina *subtribe nov.* the genus *Saltuarius* Couper, Covacevich and Moritz, 1993 is separated from *Shireengecko gen. nov.* (the other genus in the subtribe) by one or other of the following suites of characters: 1/ The throat is smooth or with a few scattered tubercles; pre-anal pores are present only in the males; there are long recurved flank spines each sitting in a rosette of enlarged basal scales (subgenus *Saltuarius*), or 2/ The throat has numerous scattered tubercles and pre-anal pores are present in both sexes (subgenus *Quazisaltuarius subgen. nov.*).

The genus *Shireengecko gen. nov.* is also characterised and separated from other genera in the tribe Shireengeckiini *tribe nov.* by the following suite of characters: The throat is smooth or with a few scattered tubercles; pre-anal pores are only present in males; simple enlarged spinose flank scales sit in a rosette of flat scales which are not enlarged.

The subgenus *Quazishireengecko subgen. nov.* monotypic for the species S. (*Quazishireengecko*) *swaini* (Wells and Wellington, 1985), is separated from the nominate subgenus (all other species in the genus), by the following characters: the rostril shield is usually in contact with the nostril; the upper surfaces of the digits have spinose tubercles; the scales on the snout have conspicous scattered and enlarged scales or granules among the smaller scales above the supralabials. Conversely *Shireengecko subgen. nov.* are diagnosed and separated from *Quazishireengecko subgen. nov.* by the fact that the scales on the snout usually grade evenly and without scattered or enlarged scales or granules above the supralabials, or if this is not the case, by the rostral shield being excluded from the nostril and the upper surfaces of the digits lack spinose tubercles.

Oxygeckoina subtribe nov. is separated from the other subtribe Shireengeckiina *subtribe nov.* by the rostral scale not contacting the nostril (versus in contact with the nostril in Shireengeckiina *subtribe nov.* and the tribe Orrayini *tribe nov.*) and no preanal pores, (versus usually present in both Shireengeckiina *subtribe nov.* and the tribe Orrayini *tribe nov.*).

The tribe Shireengeckiini *tribe nov.* is defined as follows: Eye is snake-like without movable lids, pupil in daylight is a narrow vertical slit, scales on the dorsal surface are small and juxtaposed but not overlapping.

Digits are angular when viewed laterally. Feet are bird like and their terminal claws are conspicuous and free. Postmentals and adjacent gulars subequal. Original tail is broad, heart or leaf shaped and flattened and with spines, or usually without in regenerated tails. Claw between 2 scales, the lower deeply notched. Digits are compressed with three or more rows of lateral scales. Neck is not distinctly slender and elongate. Body not laterally compressed, but instead flattened. Two lumbar (rib free) vertebrae, versus 3 in geckos from the tribe Orrayini *tribe nov.* (which also separates the subtribe Shireengeckiina *subtribe nov.* from the tribe Orrayini *tribe nov.*).

Distribution: *Shireengecko gen. nov.* are found in the ranges immediately north and south of the New South Wales and Queensland border, eastern Australia. *Shireengecko subgen. nov.* are generally found south of the border and *Quazishireengecko subgen. nov.* generally north.

Etymology: Named "Quazi" as in "nearly" in conjunction with the subgenus it is most similar to, namely "*Shireengecko*". Unless mandated under rules of the *International Code of Zoological Nomenclature*, the spelling of the generic names *Shireengecko gen. nov.* or *Quazishireengecko subgen. nov.* should not be altered in any way.

Content: *Shireengecko* (*Quazishireengecko*) *swaini* (Wells and Wellington, 1985) (monotypic).

SUBGENUS *SHIREENGECKO GEN. NOV.*

Type species: *Saltuarius wyperba* Couper, Schneider and Covacevich, 1997.

Diagnosis: Refer to the preceding description for the subgenus *Quazishireengecko subgen. nov.* for the diagnosis of this subgenus as well.

Distribution: *Shireengecko gen. nov.* are found in the ranges immediately north and south of the New South Wales and Queensland border, eastern Australia. *Shireengecko subgen. nov.* are generally found south of the border and *Quazishireengecko subgen. nov.* generally north.

Etymology: See for the same genus.

Content: *Shireengecko* (*Shireengecko*) *wyperba* Couper, Schneider and Covacevich, 1997 (type species); *S.* (*Shireengecko*) *kateae* (Couper, Sadlier, Shea and Worthington Wilmer, 2008); *S.* (*Shireengecko*) *moritzi* (Couper, Sadlier, Shea and Worthington Wilmer, 2008).

CARPHODACTYLUS HOSERAE SP. NOV.

Holotype: A preserved female specimen at the Queensland Museum, Brisbane, Queensland, Australia, specimen number: J60714 collected at Thornton Peak National Park on CREB track from Daintree Crossing, Queensland, Australia, Latitude -16.10, Longitude 145.34.

The Queensland Museum, Brisbane, Queensland, Australia is a government-owned facility that allows access to its holdings.

Paratype: A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number: R.2252, collected at Bloomfield River, Cooktown, Queensland, Australia, Latitude -15.97, Longitude 145.32.

Diagnoisis: *Carphodactylus hoserae sp. nov.* is similar in most respects to *C. laevis* Günther, 1897, which it has until now been treated as being. However *C. hoserae sp. nov.* is readily separated from *C. laevis* by having a large number of medium sized black spots and flecks across the upper body in a consistent pattern (as depicted on page 262 of Cogger 2014), versus none or only a few tiny black flecks in *C. laevis*, which if present are so tiny and few as to appear random (as depicted on page 39 of Wilson 2015). On *C. hoserae sp. nov.* these distinctive black spots are also on the limbs, whereas these are always absent in *C. laevis.*

C. hoserae sp. nov. has a well-defined orange tinge in the scales above the eye, giving it an edged appearance. In *C. laevis* this colouration is either absent or indistinct.

This species and *C. laevis* Günther, 1897 are separated from all other Australian geckos by the following suite of characters:

Eye is snake-like without movable lids, pupil in daylight is a narrow vertical slit, scales on the dorsal surface are small and juxtaposed but not overlapping. Digits are angular when viewed laterally. Feet are bird like and their terminal claws are conspicuous and free. The digits are angular when viewed laterally. Postmentals and adjacent gulars subequal. Digits are long, slender and only moderately compressed distally and without enlarged apical subdigital lamellae, but with a single series of slightly swollen transverse lamellae. Original tail ending in a tapered tip and without a terminal knob. Claw between five scales. Body is laterally compressed. Rostral and mental shields are rounded. Labials are much larger than adjacent scales. Postmentals and adjacent gulars are subequal. Preanal pores are present. Adults have snout vent length of about 13 cm (adapted from Cogger 2014).

Distribution: *C. hoserae sp. nov.* occurs in the northern wet tropics region of Queensland in the general region bounded by Mount Lewis in the South and Cooktown in the north. By contrast *C. laevis*, with a type locality of Mount Bartle Frere, Queensland, occurs in the general region from Cairns and south in the wet tropics including the Atherton Tableland, Queensland. There is a gap between the known ranges of both species of about 20 km straight line.

Etymology: Named in honour of my mother, Katrina Hoser, in recognition of a substantial contribution to wildlife conservation globally, spanning more than 4 decades.

UVIDICOLUS COVACEVICHAE SP. NOV.

Holotype: A preserved specimen in the Queensland Museum, Brisbane, Australia, specimen number: J3859 from the Pikes Creek area, near Girraween National Park area, Southern Downs, Queensland, Australia, Latitude -28.7, Longitude 151.6. The Queensland Museum, Brisbane, Australia is a government-owned facility that allows access to its holdings.

Paratype: A preserved specimen in the Queensland Museum, Brisbane, Australia, specimen number: J4342 from near the Pikes Creek area, near Girraween National Park area, Southern Downs, Queensland, Australia, Latitude -28.7, Longitude 151.9.

Diagnosis: *Uvidicolus covacevichae sp. nov.* has until now been thought of as a northern population of *U. sphyrurus* (Ogilby, 1892). However, both populations are geographically separated, molecular studies show that they have significant divergence and they are morphologically distinct and easily distinguished. Furthermore, both are readily distinguished by consistent colour differences between specimens, enabling field workers the ability to identify either species at a glance.
U. sphyrurus are characterised by a distinctive dorsal patterning of numerous small or medium-sized white spots, brownish at the edges, in turn etched with blackish pigment giving a somewhat bright occelated appearance, or alternatively a distinct pattern of bright yellow dorsal spots without the etching, this being most common in immature specimens. When etched these spots cover half the dorsal surface. There is no configuration remotely like these/this in *U. covacevichae sp. nov.*. By contrast *U. covacevichae sp. nov.* has a relatively even drab brown dorsal surface with about 5 indistinct or broken white cross bands (not seen in *U. sphyrurus*) between which are large semidistinct dark blotches (also not seen in *U. sphyrurus*).

In *U. covacevichae sp. nov.* there is a distinct black streak running from the lower back of the eye to the back of the jaw. This is either absent, indistinct or broken in *U. sphyrurus.*

In *U. covacevichae sp. nov.* that have any white spots on the dorsal surface, these contrast with those seen in *U. sphyrurus* by not being etched with blackish pigment.

Some specimens of *U. sphyrurus* have a semi-distinct broken black line separating the coloured dorsum from the pale venter and this is not seen in *U. covacevichae sp. nov..*

A typical specimen of *U. covacevichae sp. nov.,* depicted as "*Underwoodisaurus sphyrurus*" is shown at the bottom of page 174 of Swan (2008), on page 243 of Wilson and Knowles (1998) depicted as "*Underwoodisaurus sphyrurus*" or page 38 of Wilson (2015).

Typical *U. sphyrurus* is depicted on page 43 of Swan, Shea and Sadlier (2009).

Of peripheral relevance is that the names *Gymbodactylus sphyrurus* Ogilby, 1892 and *Hetoronota walshi* Kinghorn, 1931 both from New South Wales, both apply to the southern population, now known as *U. sphyrurus* and so were not available names for the newly named taxon *U. covacevichae sp. nov.*.

Distribution: *U. covacevichae sp. nov.* are known only from the general vicinity of the type location being the Girraween National Park area, Southern Downs, Queensland, Australia. Specimens from near the New England Region of New South Wales and west of there are of *U. sphyrurus.*

Etymology: Named in honour of the late Jeanette Covacevich, formerly of the Queensland Museum in Brisbane, Queensland, Australia until her retirement and recently deceased from cancer, in recognition of her significant contributions to herpetology in Queensland, Australia.

SALTUARIUS ADELYNAE SP. NOV.

Holotype: A preserved male specimen at the Queensland Museum, Brisbane, Queensland, Australia, specimen number J27145 collected from the Big Tableland area, North Queensland, Latitude -15.8, Longitude 145.3. The Queensland Museum, Brisbane, Queensland, Australia, is a government-owned facility that allows access to its holdings.

Paratype: A preserved specimen at the Queensland Museum, Brisbane, Queensland, Australia, specimen number J17801 collected from the Big Tableland area, North Queensland, Latitude -15.8, Longitude 145.3.

Diagnosis: *Saltuarius adelynae sp. nov.* has until now been treated as a northern population of *S. cornutus* (Ogilby, 1892). However, both populations are geographically separated, molecular studies show that they have significant divergence and they are morphologically distinct and easily distinguished.

The species *S. cornutus* has a different shaped dark depressed patch at back of head to that seen in *S. adelynae sp. nov.*.

In *S. cornutus* it is pointing backwards and shaped like a drawing of a typical mesa-shape as seen in a desert (as seen easily in the image of a specimen on page 278 of Cogger 2014, and again on page 279 in the right hand image, in the same book), versus a large rounded C-shaped patch in *S. adelynae sp. nov.*.

The original tail in *S. cornutus* including on the mid dorsal line has a very thin dark or light stripe down the middle, often broken, versus no such line in *S. adelynae sp. nov.*.

In *S. cornutus*, the black bands on the toes are significantly smaller than the white ones, versus larger than or roughly equal in size to the white bands in *S. adelynae sp. nov.*.

There is a significant amount of white etching on the dorsal body surface in *S. cornutus*, versus none, little or indistinct in *S. adelynae sp. nov.*.

Typical *S. cornutus* is depicted on page 140 (bottom image) in Swan (2008).

The type locality for *S. cornutus* (Ogilby, 1892) is the Bellenden Ker ranges 60 km south of Cairns near Babinda, Queensland. The type locality for *Phyllurus lichenosus* Günther, 1897 is Mount Bartle Frere, Queensland. 51.8 km south of Cairns and near the Bellenden Ker ranges. It is therefore a junior synonym of *S. cornutus* (Ogilby, 1892) and not an available name for the species *S. adelynae sp. nov.*.

Distribution: *S. adelynae sp. nov.* occurs in the northern wet tropics in the hills immediately north of Mount Lewis to just south of Cooktown, Queensland, Australia. *S. cornutus* is found in the general region from Cairns and west of there to the vicinity of Mount Spec in the Paluma Range National Park, north of Townsville, Queensland.

Etymology: Named in honour of my daughter, Adelyn Hoser, aged 17 in 2016 in recognition of a lifetime's work in hands-on wildlife conservation.

SALTUARIUS (*QUAZISALTUARIUS*) *JACKYAE SP. NOV.*

Holotype: A preserved specimen at the Queensland Museum, Brisbane, Queensland, Australia, specimen number J74946 collected at the Blackdown Tableland, National Park, Queensland, Australia, Latitude -23.46, Longitude 149.04. The Queensland Museum, Brisbane, Queensland, Australia, is a government-owned facility that allows access to its holdings.

Paratype: A preserved specimen at the Queensland Museum, Brisbane, Queensland, Australia, specimen number J35448 collected at the Blackdown Tableland, National Park, Queensland, Australia, Latitude -23.90, Longitude 149.20.

Diagnosis: *Saltuarius* (*Quazisaltuarius*) *jackyae sp. nov.* has until now been treated as a north-western population of *S. salebrosus* Covacevich, 1975. However molecular results show a significant divergence between this western outlier population and *S. salebrosus* and they are easily distinguished morphologically.

At a glance one can immediately distinguish the two species by the fact that in *S. jackyae sp. nov.* the dark and light dorsal body blotches are not etched with obvious thick sharp brownish-black borders as seen in *S. salebrosus.* The hind limbs of *S. jackyae sp. nov.* lack the obvious jagged cross-lines seen on *S. salebrosus*, instead appearing to be punctuated by either irregular markings or alternatively vague and indistinct banding.

The front toes of *S. jackyae sp. nov.* have more dark (brown to black) pigment as seen in the cross bands, versus the reverse in *S. salebrosus.*

Typical *S. jackyae sp. nov.* is depicted on page 280 of Cogger (2014) identified as "*Saltuarius salebrosus*" and also page 243 (photo 219) in Wilson and Knowles (1988), depicted as "*Phyllurus salebrosus*".

Typical *S. salebrosus* is depicted on page 144 of Swan (2008), in the bottom image or page 46, or Wilson (2015) in the top right image.

Distribution: The species *S. jackyae sp. nov.* is only known from the Blackdown Tableland National Park, south-east Queensland, Australia. The similar species *S. salebrosus* is found about 150 km further south-east in the general vicinity of the type locality, Monto, also in south-east Queensland.

Etymology: Named in honour of my daughter, Jacky Indigo Hoser, aged 15 in 2016 in recognition of a lifetime's work in wildlife conservation.

NEPHRURUS (*NEPHRURUS*) *BLACKI SP. NOV.*

Holotype: A preserved specimen at the Queensland Museum, Brisbane, Queensland, Australia, specimen number J54644 collected at Heathlands Road, 1km from the Main Cape Road junction, far North Queensland, Australia, Latitude -11.77, Longitude 142.67. The Queensland Museum, Brisbane, Queensland, Australia, is a government-owned facility that allows access to its holdings.

Paratype: A preserved specimen at the Queensland Museum, Brisbane, Queensland, Australia, specimen number J57652 collected at 6.5km east of the Heathlands airstrip, far North Queensland, Australia, Latitude -11.44, Longitude 142'38.

Diagnosis: *Nephrurus blacki sp. nov.* has until now been recognized as a variant of *N. asper* Günther, 1876. However it can be readily distinguished from that species on the basis of colouration.

N. asper is characterised by dullish colouration with indistinct narrow, irregular dorsal crossbands (as depicted on page 40, of Wilson (2015) in the bottom left photo), or sometimes with scattered whitish spots as raised individual scales in a somewhat banded configuration (as depicted on page 264 of Cogger (2014), top right photo), but otherewise on a plain body background.

By contrast *Nephrurus blacki sp. nov.* has a distinct and spectacular pattern of well-marked wide dorsal crossbands, alternating dark and light as depicted on page 59 of Couper and Gregson (1994) in the bottom image. However, I note that the particular specimen in the image was nowhere near as brilliantly coloured as most other *N. blacki sp. nov.*. The bands are formed by a significant merging of the individual white scales that are scattered in *N. asper.*

The distinctive banding of *N. blacki sp. nov.* carries over to the front limbs, which are also well banded, extending to a limited degree to the digits, but not as complete dark and light bands on them as seen in *N. sheai* Couper, 1994. By contrast *N. asper* either has no banding on the front limbs, spotting only, or rarely indistinct bands, which never extends to the toes, which may be spotted, but never with any semblence of crossbands.

N. blacki sp. nov. also has significant lightening of the snout, not seen in *N. asper.*

The three currently recognized species within the subgenus *Nephrurus* (predating this paper), better known as the classic "Rough-knob-tailed geckos" as defined previously in this paper can be divided as follows: 1/ *N. sheai* Couper, 1994 (including the subspecies, *N. sheai kimberleyae subsp. nov.* formally named within this paper) has digits strongly banded with brown and white; 2/ *N. amyae* Couper, 1994 lacks bands on the digits and has extremely pronounced tubercles on the rump and thighs which are much larger than those covering the rest of the dorsum; 3/ *N. asper* Günther, 1876 (including *N. blacki sp. nov.* and the subspecies *N. asper saxacola subsp. nov.*) lacks prominent bands on the digits and the tubercles on the rump and thighs are small to moderate.

Couper and Gregson were easily able to separate specimens of *N. blacki sp. nov*. from nominate *N. asper*, but decided "The broad-banded CYP specimens are regarded as a geographically distinct colour morph of *N. asper.*" They did not give these lizards any taxonomic recognition. However the moleclular results of Oliver and Bauer (2011), showed that the divergence between these "broad-banded CYP specimens" and nominate *N. asper* was sufficient to warrant taxonomic recognition at the species level. Hence they are named in this paper as *N. blacki sp. nov..*

There are numerous excellent images of this taxon (listed as *N. asper*) on the internet on photo-sharing sites such as "www dot flickr dot com".

Distribution: The drier parts of Cape York, Queensland, Australia, north of the wet tropics belt on the southern parts of Cape York, the southern limit of distribution being Mount Surprise, 18'21'S (Couper and Gregson, 1994).

Etymology: Named in honour of Shane Black, formerly of Sydney, New South Wales, now resident of far north Queensland, in recognition of his significant work involving the breeding of Australian elapid snakes in captivity, in particular Taipans *Oxyuranus scutellatus* (Peters, 1867) and *Parademansia microlepidota* (McCoy, 1879) at his Sydney facility. More recently the excellent quality photos of reptiles in their natural habitat that he regularly posts on the internet have provided a valuable educational resource.

He became one of many refugees from New South Wales, fleeing the disgraced ex-cops and eco-terrorists who work for the New South Wales National Parks and Wildlife Service (NPWS), after one too many illegal armed raids on his world-class breeding facility.

That single raid killed off many years of valuable conservation work and Black's marriage.

When Shane Black was confronted with the prospect of many more years of illegal armed raids by gun-toting wildlife officers, he fled. However when farmer Ian Turnbull found himself in the same situation as Shane Black, he decided to fire a round of bullets into the alcoholic wildlife officer Glen Turner, thereby killing him (Chillingworth, 2016).

Before Turnbull killed his oppressor, the evil, vindictive Glen Turner had harassed and victimized many others, causing no less than 7 law-abiding people to commit suicide.
This is the sorry state, known as the war of wildlife law enforcement in Australia as of 2016.

NEPHRURUS (*QUAZINEPHRURUS*) *COREYRENTONI SP. NOV.*

Holotype: A preserved specimen at the South Australian Museum (SAM), Adelaide, South Australia, Australia, specimen number: SAM R36563, collected at 7.5 km north of Courtabie, South Australia, Australia, Latitude 33.14, Longitude 134.83.

The South Australian Museum, South Australia, Australia is a government-owned facility that allows access to its holdings.

Paratypes: Three preserved specimens at the South Australian Museum (SAM), Adelaide, South Australia, Australia, specimen numbers: SAM R12614.A, R12614.B and R12614.C, collected from the Eastern Edge of Bascombes Well National Park, Eyre Peninsula, South Australia, Australia, Latitude -33.67, Longitude 135.52.

Diagnosis: *Nephrurus coreyrentoni sp. nov.*, has until now been treated as a population of *N. stellatus* Storr, 1963 and would in the absence of the diagnostic information herein, otherwise be identified as that taxon using the text of Cogger (2014). However *N. coreyrentoni sp. nov.*, is readily separated from *N. stellatus* by having a dorsal pattern comprising of small white spots that are dull in appearance, as opposed by being bright and well-defined in *N. stellatus.* In *N. stellatus* there is a well-defined patch of white underneath the eye, which extends backwards about half way towards the ear. In *Nephrurus coreyrentoni sp. nov.* this patch is ill defined, though still present. *Nephrurus coreyrentoni sp. nov.* is also defined by a distinct bluey green patch above each eye, versus purplish in *N. stellatus.*

Oliver and Bauer (2011), wrote: "The uncorrected genetic divergence between two allopatric populations of *N. stellatus* across southern Australia (either side of the Nullarbor Plain) was also comparatively low (5.3%)." As mentioned already in this paper, in the case of many other reptiles, far lower divergences have resulted in new species being erected (e.g. Harvey *et al.* 2000), which is why I have had no problem in formally describing this taxon herein as a new species.

Both *N. stellatus* and *N. coreyrentoni sp. nov.* are separated from all other *Quazinephrurus subgen. nov.* species by the following suite of characters: There is no vertebral stripe in adults and if one is present in juveniles, there are nine or more longitudinal rows of enlarged tubercles on the tail; the tail is narrow and only slightly depressed; most enlarged tubercles on the back are surrounded by a ring of scales which are noticeably larger than the other body scales between the tubercles; back and flanks have numerous white spots, each much larger than the central tubercle.

As already mentioned these spots are bright and well defined in *N. stellatus* versus dull in *N. coreyrentoni sp. nov.*, which allows either taxon to be separated from one another at a glance. Typical *N. stellatus* is depicted on page 268 of Cogger (2014), in the photo on the bottom left, while typical *N. coreyrentoni sp. nov.* is depicted in Ehmann (1992), page 64 at bottom.

Distribution: *N. coreyrentoni sp. nov.* are found along the south coast of South Australia, from the Eyre Peninsula, to just east of the Western Australian border, Australia. The species *N. vertebralis* Storr, 1963 is herein restricted to inland South-eastern Western Australia as a completely disjunct population.

Etymology: Named in honour of Corey Renton of Paradise, South Australia, Australia, son of Ian Renton, owner of "Snake-away Services", in recognition of his many decades of working to educate people about reptiles and removing unwanted venomous snakes from homes in Adelaide, South Australia.

NEPHRURUS (*QUAZINEPHRURUS*) *IANRENTONI SP. NOV.*

Holotype: A preserved specimen at the Western Australian Museum, Perth, Western Australia, Australia, specimen number: R139007, collected from Mandora, Western Australia, Australia, Latitude -19.812, Longitude 121.47.

The Western Australian Museum, Perth, Western Australia, Australia is a government-owned facility that allows access to its holdings.

Paratype: A preserved specimen at the Western Australian Museum, Perth, Western Australia, Australia, specimen number: R139003, collected from Mandora, Western Australia, Australia, Latitude -19.812, Longitude 121.47.

Diagnosis: Until now *N. ianrentoni sp. nov.* has been treated as the western population of *N. laevissimus*, which is what both taxa would key as using the text of Cogger (2014). *N. ianrentoni* *sp. nov.* is separated from *N. laevissimus* by the presence of a distinctive white stripe running from under the eye towards the ear, versus either none or an indistinct marking without well defined boundaries in *N. laevissimus.*

N. laevissimus has a moderate to significant amount of peppering across the upper body, versus either none or very little in *N. ianrentoni sp. nov.*.

In *N. ianrentoni sp. nov.*, whitening of the lower labials along the lower jaw extends most of the way along the lower jaw, versus only about half way in *N. laevissimus.*
N. laevissimus and *N. ianrentoni sp. nov.* are readily separated from all othere *Nephrurus sensu lato* (including all subgenera defined in this paper) by the absence of tubercles on the flanks.

Distribution: Arid parts (sand dunes) of the North-west Australian coast and nearby regions of north-western Western Australia, centered in the region of the Great Sandy Desert, between Broome and Port Hedland.

Etymology: Named in honour of Ian Renton of Paradise, South Australia, Australia, owner of "Snake-away Services", in recognition of his many decades of working to educate people about reptiles and removing unwanted venomous snakes from homes in Adelaide, South Australia.

UNDERWOODISAURUS MILII (BORY DE SAINT-VINCENT, 1825)

Type locality: Shark Bay, Western Australia.

Discussion and Diagnosis: *Underwoodisaurus* Wermuth, 1965 has been treated as monotypic, for the species *U. milii* (Bory de Saint-Vincent, 1835) by most authors since the removal of the species *Gymnodactylus spyrurus* Ogilby, 1892 from the genus by Oliver and Bauer in 2011, when they created a new monotypic genus *Uvidicolus* to accomodate the putative species.

Also in 2011, Doughty and Oliver described the species *U. seorsus* from the Hamersley Range, Western Australia as a part of the *U. milii* complex, which by virtue of the actions of Oliver and Bauer (2011) was putatively the only species remaining in the genus.

However the dismemberment of the genus commenced earlier, with Boulenger in 1913, when he described the taxon *Gymnodactylus asper* Boulenger, 1913 from inland Australia, with reference to the other species.

Wells and Wellington (1983) described another taxon in the species complex, called *U. husbandi*, being the distinctive form from the east coast.

In 1985 the two authors added Boulenger's species *U. asper* to the complex, making it a total of three species. If one adds *U. seorsus* to the group, there are four species in the group with available names.

The molecular results of Oliver and Bauer (2011) provide evidence for no less than four species and their data does not include samples for *U. seorsus* or the east coast form (*U. husbandi*).

Inspection of live and dead specimens from all relevant locations supports the concept of there being at least six distinguishable species in the complex and so all are identified herein for the first time ever.

The available names for four as mentioned above are used and two others are formally assigned under the rules of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999).

In summary the six relevant species are as follows:

U. milii (Bory de Saint-Vincent, 1835) from Shark Bay and nearby parts of the mid Western Australian coast.

U. perthensis sp. nov. from south-west Western Australia, in the general region of Perth.

U. husbandi Wells and Wellington, 1983, from coastal New South Wales.

U. seorsus from the Hamersley Range in Western Australia.

U. asper (Boulenger, 1913), from Central and inland north-east Australia, in the general vicinity of the Cooper's Creek drainage, as in the elevated areas nearby.

U. mensforthi from most of southern Australia, excluding the far west and far east and north-east.

The various taxa are separated from one another by the following unique suites of colouration traits:

U. milii are separated from the other species by having a brown body with yellow spots which merge and are arranged into well defined broken dorsal crossbands along the entire length of the body and tail. None of the white crossbands of the black tail have any black or grey pigment, except for the second one, which has limited black or grey pigment within it (original tails). The white crossbands on the tail are without borders.

Nominate *U. mensforthi sp. nov.* is characterised by a distinctly black tail with white cross bands that lack any darker pigment in them (original tails), with a dark brownish body and bright yellow spots on the body, extending onto the hindlimbs and to a limited extent the upper forelimbs. There is significant lightening of the front of the snout. The white spots on the body form a broken reticulated configuration and not as bands of any sort, except in the context as described below. There are very indistinct orange spots on the dorsal surface.

In *U. mensforthi sp. nov.* and *U. mensforthi martinekae subsp. nov.* as well as *U. husbandi*, the spots on the back of the head and front of the body merge to form a nuchal band and one or more broken crossbands.

The subspecies *U. mensforthi martinekae subsp. nov.* are separated from the nominate form of *U. mensforthi sp. nov.* by having significantly more white spots along the lower flanks, giving a distinctly striped appearance along the lower margins, as well as significant spotting on the lower forelimbs, which is absent in *U. mensforthi sp. nov.*.

U. husbandi is similar in most respects to *U. milii,* but is separated from that taxon by being generally purple in colour (versus brownish) and without significant lightening of the front of the snout. There are significant numbers of yellow spots on both upper and lower hind and forelimbs. There are no orange spots of any form on the dorsal surface. As in *U. mensforthi sp. nov.* and *U. mensforthi martinekae subsp. nov.* the spots on the back of the head and front of the body merge to form a nuchal band and one or more broken crossbands, but these are not found on the lower body as in *U. milii.*

U. asper is readily separated from the other species by its reddish brown body, including the tail (original tails), the white dorsal spots being arranged into obvious broken crossbands along the length of the body, including very distinct and thickened nuchal bands, in addition to distinct orange spots covering the rest of the dorsal surface. There is significant white spotting on all the limbs, both top and bottom parts. This taxon has a reddish brown tail with whitish crossbands bordered with purple.

U. perthensis sp. nov. are readily separated from all other forms by a distinctly blackish hue throughout the body and tail, in association with a dark purplish colouration. Besides the white spots on the body there are also indistinct black spots. The white bars on the tail are broken with black pigment. The white spots at the front of the body do not coalesce to form a nuchal band of any sort. Upper and lower limbs are peppered with white.

U. seorsus is separated from all other species by having unusually small (tiny) pale tubercles on the back of the body and these being scattered evenly (by density and distribution) from neck to the hind limbs, as opposed to being more prominent on the forebody than the rear in the other species (excluding *U. milii* and *U. asper* which have broken crossbands the length of the body). Furthermore there are no obvious nuchal bands, this part of the body at best having widely scattered white spots. The head is notable in being unmarked and purplish in colour, limbs (upper and lower) are well spotted with yellow and the white cross bands on the tail are merely enlarged transversely aligned spots with about 50% of the bands being obvious purple pigment.

Distribution: *U. milii* is apparently confined to the mid coastal region of Western Australia in the general vicinity of Shark Bay. On the south-west Australian coast and nearby wheatbelt areas are *U. perthensis.*

UNDERWOODISAURUS PERTHENSIS SP. NOV.

Holotype: A preserved specimen at the Western Australian Museum, Perth, Western Australia, Australia, specimen number: REPT:R49250, collected at the site of a proposed dam on the Collie River, about 25 km North-west of Collie, Western Australia, Australia, Latitude -33.37, Longitude 115.92.

The Western Australian Museum, Perth, Western Australia, Australia is a government owned facility that allows access to its holdings.

Paratypes: Two preserved specimens at the Western Australian Museum, Perth, Western Australia, Australia, specimen numbers: REPT:R49251 and REPT:R49252, collected at the site of a proposed dam on the Collie River, about 25 km North-west of Collie, Western Australia, Australia, Latitude -33.37, Longitude 115.92.

Diagnosis: The various taxa within the so-called *U. milii* (Bory de Saint-Vincent, 1835) species complex are separated from one another by the following unique suites of colouration traits as follows:

U. perthensis sp. nov. are readily separated from all other forms by a distinctly blackish hue throughout the body and tail, in association with a dark purplish colouration. Besides the white spots on the body there are also indistinct black spots. The white bars on the tail are broken with black pigment. The white spots at the front of the body do not coalesce to form a nuchal band of any sort, although there are some aberrant specimens with a broken nuchal band. Upper and lower limbs are peppered with white.

U. milii are separated from the other species by having a brown body with yellow spots which merge and are arranged into well defined broken dorsal crossbands along the entire length of the body and tail. None of the white crossbands of the black tail have any black or grey pigment, except for the second one, which has limited black or grey pigment within it (original tails). The white crossbands on the tail are without borders.

Nominate *U. mensforthi sp. nov.* is characterised by a distinctly black tail with white cross bands that lack any darker pigment in them (original tails), with a dark brownish body and bright yellow spots on the body, extending onto the hindlimbs and to a limited extent the upper forelimbs. There is significant lightening of the front of the snout. The white spots on the body form a broken reticulated configuration and not as bands of any sort, except in the context as described below and not as bands of any sort. There are very indistinct orange spots on the dorsal surface.

In *U. mensforthi sp. nov.* and *U. mensforthi martinekae subsp. nov.* as well as *U. husbandi*, the spots on the back of the head and front of the body merge to form a nuchal band and one or more broken crossbands.

The subspecies *U. mensforthi martinekae subsp. nov.* are separated from the nominate form of *U. mensforthi sp. nov.* by having significantly more white spots along the lower flanks, giving a distinctly striped appearance along the lower margins, as well as significant spotting on the lower forelimbs, which is absent in *U. mensforthi sp. nov.*.

U. husbandi is similar in most respects to *U. milii,* but is separated from that taxon by being generally purple in colour (versus brownish) and without significant lightening of the front of the snout. There are significant numbers of yellow spots on both upper and lower hind and forelimbs. There are no orange spots of any form on the dorsal surface. As in *U. mensforthi sp. nov.* and *U. mensforthi martinekae subsp. nov.* the spots on the back of the head and front of the body merge to form a nuchal band and one or more broken crossbands, but these are not found on the lower body as in *U. milii.*

U. asper is readily separated from the other species by its reddish brown body, including the tail (original tails), the white dorsal spots being arranged into obvious broken crossbands along the length of the body, including very distinct and thickened nuchal bands, in addition to distinct orange spots covering the rest of the dorsal surface. There is significant white spotting on all the limbs, both top and bottom parts. This taxon has a reddish brown tail with whitish crossbands bordered with purple.

U. seorsus is separated from all other species by having unusually small (tiny) pale tubercles on the back of the body and these being scattered evenly (by density and distribution) from neck to the hind limbs, as opposed to being more prominent on the forebody than the rear in the other species (excluding *U. milii* and *U. asper* which have broken crossbands the length of the body). Furthermore there are no obvious nuchal bands, this part of the body at best having widely scattered white spots. The head is notable in being unmarked and purplish in colour, limbs (upper and lower) are well spotted with yellow and the white cross bands on the tail are merely enlarged transversely aligned spots with about 50% of the bands being obvious purple pigment.

Distribution: South-west Western Australia.

Etymology: Named in reflection of the centre of distribution for this species, (namely Perth, Western Australia).

UNDERWOODISAURUS MENSFORTHI SP. NOV.

Holotype: A preserved specimen at the South Australian Museum, Adelaide, South Australia, Australia, specimen number: R2778, collected from Myponga, South Australia, Australia, Latitude -35.38, Longitude 138.47. The South Australian Museum, Adelaide, South Australia, Australia, is a government-owned facility that allows access to its holdings.

Paratypes: 1/ A preserved specimen at the South Australian Museum, Adelaide, South Australia, Australia, specimen number: R2504, collected from Second Valley, South Australia, Australia, Latitude -35.53, Longitude 138.23.

2/ A preserved specimen at the South Australian Museum, Adelaide, South Australia, Australia, specimen number: R3017, collected from Normanville, South Australia, Australia, Latitude -35.45, Longitude 138.32.

3/ A preserved specimen at the South Australian Museum, Adelaide, South Australia, Australia, specimen number: R19956, collected from near Myponga Beach, South Australia, Australia, Latitude -35.37, Longitude 138.38.

Diagnosis: The various taxa within the so-called *U. milii* (Bory de Saint-Vincent, 1835) species complex are separated from one another by the following unique suites of colouration traits:

U. milii are separated from the other species by having a brown body with yellow spots which merge and are arranged into well defined broken dorsal crossbands along the entire length of the body and tail. None of the white crossbands of the black tail have any black or grey pigment, except for the second one, which has limited black or grey pigment within it (original tails). The white crossbands on the tail are without borders.

Nominate *U. mensforthi sp. nov.* is characterised by a distinctly black tail with white cross bands that lack any darker pigment in them (original tails), with a dark brownish body and bright yellow spots on the body, extending onto the hindlimbs and to a limited extent the upper forelimbs. There is significant lightening of the front of the snout. The white spots on the body form a broken reticulated configuration and not as bands of any sort, except in the context as described below and not as bands of any sort. There are very indistinct orange spots on the dorsal surface.

In *U. mensforthi sp. nov.* and *U. mensforthi martinekae subsp. nov.* as well as *U. husbandi*, the spots on the back of the head and front of the body merge to form a nuchal band and one or more broken crossbands.

The subspecies *U. mensforthi martinekae subsp. nov.* are separated from the nominate form of *U. mensforthi sp. nov.* by having significantly more white spots along the lower flanks, giving a distinctly striped appearance along the lower margins, as well as significant spotting on the lower forelimbs, which is absent in *U. mensforthi sp. nov.*.

U. husbandi is similar in most respects to *U. milii,* but is separated from that taxon by being generally purple in colour (versus brownish) and without significant lightening of the front of the snout. There are significant numbers of yellow spots on both upper and lower hind and forelimbs. There are no orange spots of any form on the dorsal surface. As in *U. mensforthi sp. nov.* and *U. mensforthi martinekae subsp. nov.* the spots on the back of the head and front of the body merge to form a nuchal band and one or more broken crossbands, but these are not found on the lower body as in *U. milii.*

U. asper is readily separated from the other species by its reddish brown body, including the tail (original tails), the white dorsal spots being arranged into obvious broken crossbands along the length of the body, including very distinct and thickened nuchal bands, in addition to distinct orange spots covering the rest of the dorsal surface. There is significant white spotting on all the limbs, both top and bottom parts. This taxon has a reddish brown tail with whitish crossbands bordered with purple.

U. perthensis sp. nov. are readily separated from all other forms by a distinctly blackish hue throughout the body and tail, in association with a dark purplish colouration. Besides the white spots on the body there are also indistinct black spots. The white bars on the tail are broken with black pigment. The white spots at the front of the body do not coalesce to form a nuchal band of any sort. Upper and lower limbs are peppered with white.

U. seorsus is separated from all other species by having unusually small (tiny) pale tubercles on the back of the body and these being scattered evenly (by density and distribution) from neck to the hind limbs, as opposed to being more prominent on the forebody than the rear in the other species (excluding *U. milii* and *U. asper* which have broken crossbands the length of the body). Furthermore there are no obvious nuchal bands, this part of the body at best having widely scattered white spots. The head is notable in being unmarked and purplish in colour, limbs (upper and lower) are well spotted with yellow and the white cross bands on the tail are merely enlarged transversely aligned spots with about 50% of the bands being obvious purple pigment.

The species within Nephruriini *tribe nov.* are separated from all other Carphodactylidae by one of the following two suites of characters: 1/ The (unregenerated) tail ends in a small but distinctive knob (genus *Nephrurus* Günther, 1876), or 2/ The tail does not end in a small but distinctive knob; the claw is between 2 scales, the lower scale may be deeply grooved or even divided to form 3 scales; digits with two rows of lateral scales; tail is swollen without spines and less than twice as broad as thick (genera *Underwoodisaurus* Wermuth, 1965; *Uvidicolus* Oliver and Bauer, 2011).

Underwoodisaurus is separated from *Uvidicolus,* this latter genus being the totality of the subtribe Uvidicolina *subtribe nov.* by having the anterior loreals minute, granular and strongly differentiated from the posterior loreals, versus the anterior and posterior loreals being more or less subequal, without marked differentiation anteriorly in *Uvidicolus.*

Distribution: Most of southern Australia, excluding the very far west and far east and north-east. The nominate subspecies *U. mensforthi mensforthi subsp. nov.* is confined the the Eyre Peninsula, Kangaroo Island and Adelaide Hills regions. *U. mensforthi martinekae subsp. nov.* occupies the rest of the range for the species.

Etymology: Named in honour of Ian Mensforth of Adelaide, South Australia, Australia, owner of the business, Ultimate Reptile Supplies, of Burton, South Australia in recognition of a lifetime's work with reptiles and looking after their welfare. This has been mainly via his business selling goods and services to aid reptile keepers, including for example such staples as "anti-mite spray" and other things required to keep captive reptiles in top condition. He has also bred many hundreds of snakes as a breeder, supplying budding herpetologists across Australia, generally supplying healthy reptiles of top quality.

Significantly he supplied Snakebusters: Australia's best reptiles, the first Inland Taipan in the world to have venomoid surgery at end 2004 (the surgery as detailed by Hoser 2014) and that snake remains alive and well and still totally non-venomous as of mid 2016.

It has been used to safely educate many thousands of Australians about the positive aspects of venomous snakes, instead of the "this thing will kill you!" scare campaigns as epitomized by the trash-TV shows of the late Steve Irwin.

UNDERWOODISAURUS MENSFORTHI MARTINEKAE SUBSP. NOV.

Holotype: A preserved specimen at the National Museum of Victoria, Melbourne, Victoria, Australia, specimen number: D1836 collected at Castlemaine, Victoria, Australia, Latitude -37.07, Longitude 144.22.
The National Museum of Victoria, Melbourne, Victoria, Australia is a government-owned facility that allows access to its holdings.

Paratypes: 1/ A preserved specimen at the National Museum of Victoria, Melbourne, Victoria, Australia, specimen number: D1837 collected at Castlemaine, Victoria, Australia, Latitude -37.07, Longitude 144.22.

2/ A preserved specimen at the National Museum of Victoria, Melbourne, Victoria, Australia, specimen number: D48722 collected at Mt. Alexander, near Castlemaine, Victoria, Australia, Latitude -37.07, Longitude 144.30.

3/ A preserved specimen at the National Museum of Victoria, Melbourne, Victoria, Australia, specimen number: D5327 collected at Mt. Tarrengower, near Castlemaine, Victoria, Australia, Latitude -37.00, Longitude 144.05.

4/ A preserved specimen at the National Museum of Victoria, Melbourne, Victoria, Australia, specimen number: D54658 collected at Golden Point Road, Chewton, near Castlemaine, Victoria, Australia, Latitude -37.08, Longitude 144.26.

Diagnosis: The various taxa within the so-called *U. milii* (Bory de Saint-Vincent, 1835) species complex are separated from one another by the following unique suites of colouration traits:

U. milii are separated from the other species by having a brown body with yellow spots which merge and are arranged into well defined broken dorsal crossbands along the entire length of the body and tail. None of the white crossbands of the black tail have any black or grey pigment, except for the second one, which has limited black or grey pigment within it (original tails). The white crossbands on the tail are without borders.

Nominate *U. mensforthi sp. nov.* is characterised by a distinctly black tail with white cross bands that lack any darker pigment in them (original tails), with a dark brownish body and bright yellow spots on the body, extending onto the hindlimbs and to a limited extent the upper forelimbs. There is significant lightening of the front of the snout. The white spots on the body form a broken reticulated configuration and not as bands of any sort, except in the context as described below and not as bands of any sort. There are very indistinct orange spots on the dorsal surface.

In *U. mensforthi sp. nov.* and *U. mensforthi martinekae subsp. nov.* as well as *U. husbandi*, the spots on the back of the head and front of the body merge to form a nuchal band and one or more broken crossbands.

The subspecies *U. mensforthi martinekae subsp. nov.* are separated from the nominate form of *U. mensforthi sp. nov.* by having significantly more white spots along the lower flanks, giving a distinctly striped appearance along the lower margins, as well as significant spotting on the lower forelimbs, which is absent in *U. mensforthi sp. nov.*.

U. husbandi is similar in most respects to *U. milii,* but is separated from that taxon by being generally purple in colour (versus brownish) and without significant lightening of the front of the snout. There are significant numbers of yellow spots on both upper and lower hind and forelimbs. There are no orange spots of any form on the dorsal surface. As in *U. mensforthi sp. nov.* and *U. mensforthi martinekae subsp. nov.* the spots on the back of the head and front of the body merge to form a nuchal band and one or more broken crossbands, but these are not found on the lower body as in *U. milii.*

U. asper is readily separated from the other species by its reddish brown body, including the tail (original tails), the white dorsal spots being arranged into obvious broken crossbands along the length of the body, including very distinct and thickened nuchal bands, in addition to distinct orange spots covering the rest of the dorsal surface. There is significant white spotting on all the limbs, both top and bottom parts. This taxon has a reddish brown tail with whitish crossbands bordered with purple.

U. perthensis sp. nov. are readily separated from all other forms by a distinctly blackish hue throughout the body and tail, in association with a dark purplish colouration. Besides the white spots on the body there are also indistinct black spots. The white bars on the tail are broken with black pigment. The white spots at the front of the body do not coalesce to form a nuchal band of any sort. Upper and lower limbs are peppered with white.

U. seorsus is separated from all other species by having unusually small (tiny) pale tubercles on the back of the body and these being scattered evenly (by density and distribution) from neck to the hind limbs, as opposed to being more prominent on the forebody than the rear in the other species (excluding *U. milii* and *U. asper* which have broken crossbands the length of the body). Furthermore there are no obvious nuchal bands, this part of the body at best having widely scattered white spots. The head is notable in being unmarked and purplish in colour, limbs (upper and lower) are well spotted with yellow and the white cross bands on the tail are merely enlarged transversely aligned spots with about 50% of the bands being obvious purple pigment.

Distribution: *U. mensforthi sp. nov.* occurs in most of southern Australia, excluding the far west and far east and north-east. The nominate subspecies *U. mensforthi mensforthi subsp. nov.* is confined to the Eyre Peninsula, Kangaroo Island and Adelaide Hills regions. *U. mensforthi martinekae subsp. nov.* occupies the rest of the range for the species.

Etymology: Named in honour of former Australian Army Major, Maryann Martinek, now of Bendigo, Victoria, Australia in recognition of her work in reforming unsafe work practices in the Australian defence forces, and in initiating a Royal Commission into rapes and other sexual misconduct in the Australian military.

NEPHRURUS (QUAZINEPHRURUS) LEVIS BULLIARDI SUBSP. NOV.

Holotype: A preserved specimen at the South Australian Museum (SAM), Adelaide, South Australia, Australia, specimen number: SAM R58994, collected at Maralinga Tjarutja, South Australia, Australia, Latitude -29.13, Longitude 130.24. The South Australian Museum, Adelaide, South Australia, Australia is a government-owned facility that allows access to its holdings.

Paratype: Two preserved specimens at the South Australian Museum (SAM), Adelaide, South Australia, Australia, specimen numbers: SAM R18204 and R57159 collected at Maralinga Tjarutja, South Australia, Australia, Latitude -28.57, Longitude 130.43.

Diagnosis: Until now, *Nephrurus levis bulliardi subsp. nov.* has been treated as the nominate subspecies of *N. levis levis.*

They are readily separated from one another by the configuration of raised white or yellow spots on the upper body. In *N. levis levis* the spots are invariably associated with similar light pigment on the surrounding body scales that is not raised in a form of obvious body patterning in the form of light blotches, irregular banding, thin cross bands or similar. In *N. levis bulliardi subsp. nov.* the spotting on the upper body is effectively restricted to the raised tubercles and not as a part of wider body blotches or patterning. The only exception to this is one or two diagonal bands at the back of the neck (this also being the case in *N. levis levis*), but in *N. levis levis* the bands are found along the entire length of the body and tail).

Both *N. levis bulliardi subsp. nov.* and *N. levis levis* have raised white spots along the flanks, but in *N. levis levis* these are relatively small in number, versus profuse in *N. levis bulliardi subsp. nov.*.

Both *N. levis bulliardi subsp. nov.* and *N. levis levis* have darkening on the dorsal surface of the neck and again on the rump (as patches of colouration), but this is indistinct in *N. levis levis* and obvious in *N. levis bulliardi subsp. nov.*.

The subspecies *N. levis pilbarensis* Storr, 1963 from the northern parts of Pilbara in Western Australia, is separated from the other subspecies by the presence of large scattered granules on the throat and significantly more prominent dark markings than in the other subspecies, perhaps best described as blackish or dark purplish lines or a network that is broken in many places.

The subspecies *N. levis occidentalis* from mid coastal Western Australia is readily identified and separated from the other subspecies by the greater number of raised whitish-yellow spots across the entire body including on the rump (these spots being absent on the rump of the other subspecies, or at best extremely irregular), darker markings as patches on the body, but not purplish or blackish as in *N. levis pilbarensis* and a thick whitish bar connecting the eye to the jaw and extending well beyond the front and back of the eye, with all other subspecies either not having such a patch, or if present, not extending beyond the eye, either frontways or backwards.

The name *N. platyurus* Boulenger, 1886, is a synonym for *N. levis levis* and not available for this new subspecies.

N. levis (all subspecies) are separated from all other *Quazinephrurus subgen. nov.* species by the following suite of characters: There is no vertebral stripe in adults and if one is present in juveniles, there are nine or more longitudinal rows of enlarged tubercles on the tail; the tail is broad and flat and white/yellow spots on the back, if present are represented only by white/yellow tubercles, as opposed to being expanded larger spots, as spots and not including body blotches of similar colour.

Distribution: The region immediately north of the Nullabor Plain in western South Australia and nearby parts of central Australia. The nominate subspecies of *N. levis levis* is herein confined to the arid parts of Eastern Australia, generally east of the Coopers Creek, Lake Eyre drainage and nearby parts of the Northern Territory.

Etymology: Named in honour of Kaj-erik Bulliard of Perth Western Australia, formerly of Sydney, NSW, Australia in recognition of a contribution to herpetology in Australia spanning some decades.

NEPHRURUS (NEPHRURUS) SHEAI KIMBERLEYAE SUBSP. NOV.

Holotype: A preserved specimen at the Western Australian Museum, Perth, Western Australia, specimen number: R43153, collected at the Mitchell Plateau, West Kimberley, Western Australia, Australia, Latitude -14.87, Longitude 125.83. This is a government-owned facility that allows access to its holdings.

Paratype: A preserved specimen at the Western Australian Museum, Perth, Western Australia, specimen number: R46782 collected at Prince Regent Nature Reserve, West Kimberley, Western Australia, Australia, Latitude -15.32, Longitude 125.58.

Diagnosis: *N. sheai kimberleyae subsp. nov*. conforms in most respects with *N. sheai sheai*, which it would otherwise be identified as until now. However *N. sheai kimberleyae subsp. nov*. is separated from the nominate subspecies by the presence of well-defined dark etching between the scales on the front of the head and snout. These are either absent or indistinct in *N. sheai sheai.*

Light spots merge on the back to form unbroken or near unbroken dorsal crossbands in *N. sheai kimberleyae subsp. nov*., whereas in *N. sheai sheai* these spots are more widely spaced so that dorsal crossbands are always broken up to be at best rows of spots.

N. sheai kimberleyae subsp. nov. is depicted on page 267 of Cogger (2014), bottom right image, labelled as "*Nephrurus sheai*" clearly showing the well-defined dark etching between the scales on the front of the head and snout.

The three currently recognized species within the subgenus *Nephrurus* (predating this paper), better known as the classic "Rough-knob-tailed geckos" as defined previously in this paper can be divided as follows: 1/ *N. sheai* Couper, 1994 (including the subspecies, *N. sheai kimberleyae subsp. nov.* formally named within this paper) has digits strongly banded with brown and white: 2/ *N. amyae* Couper, 1994 lacks bands on the digits and has extremely pronounced tubercles on the rump and thighs which are much larger than those covering the rest of the dorsum: 3/ *N. asper* Günther, 1876 (including *N. blacki sp. nov.* and the subspecies *N. asper saxacola subsp. nov.*) lacks prominent bands on the digits and the tubercles on the rump and thighs are small to moderate.

Distribution: *N. sheai kimberleyae subsp. nov*. occurs in the Kimberley division of Western Australia and immediately adjacent parts of the Victoria River Region in the Northern Territory, with the barrier between the populations of the two subspecies being the Daly River System. This is the same biogeographical boundary for the eastern-most part of the range of *Acanthophis lancasteri* Wells and Wellington, 1985 as demonstrated by the evidence of Maddock *et al.* (2015). Nominate *N. sheai sheai* is herein confined to the region east of the Katherine area, including the type locality of Kakadu and nearby parts of the mid Northern Territory.

Etymology: Named in honour of my eldest daughter Adelyn Kimberely Hoser, aged 17 in 2016, in recognition of a lifetime's work with wildlife.

The name Kimberley was taken as it also denotes the region in which the taxon occurs, although the patronym is in honour of Adelyn Kimberely Hoser and the spelling or suffix should not be altered in reflection of the location of the same name unless mandated by the *International Code of Zoological Nomenclature.*

NEPHRURUS (*NEPHRURUS*) *ASPER SAXACOLA SUBSP. NOV.*

Holotype: A preserved specimen in the Queensland Museum, Brisbane, Queensland, Australia, specimen number: J4525 collected at Kuridala, south of Cloncurry, Queensland, Australia, Latitude -21.28, Longitude 140.50.

The Queensland Museum, Brisbane, Queensland, Australia is a government-owned facility that allows access to its holdings by scientists.

Paratype: A preserved specimen in the Queensland Museum, Brisbane, Queensland, Australia, specimen number: J4526 collected at Kuridala, south of Cloncurry, Queensland, Australia, Latitude -21.28, Longitude 140.50.

Diagnosis: *N. asper saxacola subsp. nov*. is readily separated from the nominate form for the species by the following suite of characters: The toes of the front feet are generally light in colour (and without any evidence of prominent banding), versus generally dark in colour in *N. asper asper*. Adults are usually a strong orangeish red colour dorsally, versus brownish grey above in most (but not all) *N. asper asper.* There is significant whitening on the front of the snout, versus none or little in *N. asper* asper, or for that matter nominate *N. amyae* Couper, 1994, which in many respects including dorsal colouration, are superficially similar to this subspecies. Adults of *N. asper saxacola subsp. nov*. are characterised by a very strong and obvious brownish-black flush on the back of the neck, extending along the back to beyond the level of the forelimbs sockets, versus one that is either indistinct or absent in *N. asper asper.* While the morphological differences between this subspecies and the nominate form are obvious, there is at present no genetic evidence to support the contention that this form is sufficiently divergent to be given full species status and hence the description herein as subspecies.

The three currently recognized species within the subgenus *Nephrurus*, better known as the classic "Rough-knob-tailed geckos" as defined previously in this paper can be divided as follows: 1/ *N. sheai* Couper, 1994 (including the subspecies, *N. sheai kimberleyae subsp. nov*. formally named within this paper) has digits strongly banded with brown and white: 2/ *N. amyae* Couper, 1994 lacks bands on the digits and has extremely pronounced tubercles on the rump and thighs which are much larger than those covering the rest of the dorsum: 3/ *N. asper* Günther, 1876 (including *N. blacki sp. nov.* and the subspecies *N. asper saxacola subsp. nov*.) lacks prominent bands on the digits and the tubercles on the rump and thighs are small to moderate.

Couper and Gregson (1994), noted that a specimen, number: R125387 lodged at the Australian Museum in Sydney, Australia, allegedly collected from Cadell Ck, near Hamilton, western QLD had strongly banded toes, this being a diagnostic feature of *N. sheai*. They questioned the validity of the collection data for the specimen.

While unable to shed light on this issue, I can state that I have inspected numerous specimens from this general locality as well as south-east, east, west and north-west of this site and none had strongly banded toes as seen in that specimen (see also the exact diagnosis for the subspecies described herein).

In other words the specimen number: R125387 at the Australian Museum in Sydney is either aberrant or has incorrect locality data.

Distribution: Restricted to the southern Selwyn Ranges south of Mount Isa, north-west Queensland, in a region generally west of the Diamantina River system west of Winton, Queensland and east of the associated Georgina River System. Those specimens found east of this range (excluding those on far north Cape York) are referred to the nominate subspecies.

Etymology: Named in reflection of the saxacoline (rock dwelling) habits of the subspecies.

NOTES ON THE DESCRIPTIONS FOR ANY POTENTIAL REVISERS

Unless mandated by the rules of the *International Code of Zoological Nomenclature*, none of the spellings of the newly proposed names should be altered in any way. Should one or more newly named taxa be merged by later authors to be treated as a single genus or species, the order of prority of retention of names should be the order as listed in the keywords part of the abstract.

Key to the species of *Underwoodisaurus* Wermuth, 1965.

1/ A/ Well defined broken cross-bands formed by merged white spots along length of body … 2
B/ Broken cross-bands only on neck region or absent … 3
2/ A/ Reddish brown tail with whitish cross-bands bordered with purple … *U. asper.*
B/ Black tail with white cross-bands without borders … *U. milii*
3/ A/ Head a uniform purplish colour … *U. seorsus.*
B/ Head not a uniform purplish colour … 4.
4/ A/ No obvious broken nuchal bands composed of yellow spots or merged spots and/or indistinct black spots on the body … *U. perthensis sp. nov.*
B/ Broken nuchal bands composed of yellow spots or merged spots … 5.
5/ A/ No indistinct orange spots on the surface … *U. husbandi.*
B/ Indistinct orange spots on the dorsal surface … 6
6/ A/ Significant spotting on the lower forelimbs … *U. mensforthi martinekae subsp. nov.*
B/ Little if any spotting on the lower forelimbs … *U. mensforthi mensforthi subsp. nov.*

REFERENCES CITED

Akeret, B. 2013. Energiewende im Terarrium. Ideen und Vorschläge, wie man Stromverbrauch und Energiekosten bei der Haltung von Terrarientieren senken kann. *Reptilia* (Münster) 18(99):18-31.

Annable, T. 1998. *Nephrurus deleani* (Harvey 1983). *Dactylus* 3(3):115-116.

Anthony, M. 1998. Top of the Range gecko - The *Saltuarius occultus* story. *Dactylus* 3(3):121-126.

Arth, S. and Baus, S. 2012. Der Australische Dickschwanzgecko, *Underwoodisaurus milii. Reptilia* (Münster) 17(98):58-67.

Barrett, C. 1950. *Reptiles of Australia*. Cassell and Co., London:168 pp.

Barts, M. and Hulbert, F. 2004. Die Geckos der Welt. *Draco* 5(18):4-17.

Bauer, A. M. 1990. Phylogenetic systematics and biogeography of the Carphodactylini (Reptilia: Gekkonidae). *Bonn. zool. Monogr.* 30:1-220.

Bauer, A. M. 1994. Liste der rezenten Amphibien und Reptilien: Gekkonidae I (Australia). *Das Tierreich*, Vol. 108, W. de Gruyter and Co. (Berlin).

Bauer, A. M. 1999. Notes on John White's Journal of a Voyage to new South Wales (1790), a Classic of Australian Herpetology. *Newsletter Internatl. Soc. Hist. Bibliogr. Herpetol.* 1(1):16-19.

Bauer, A. M. 2013. *Geckos - The Animal Answer Guide.* Johns Hopkins University Press:159 pp.

Bauer, A. M. and Henle, K. 1994. Familia Gekkonidae (Reptilia, Sauria). Part I Australia and Oceania. *Das Tierreich* 109:1-306.

Bory de Saint-Vincent, J. B. G. M. 1825. *Dictionnaire Classique d'Histoire Naturelle.* Vol. 7. Rey et Gravier, Paris.

Boulenger, G. A. 1885. *Catalogue of the Lizards in the British Museum (Nat. Hist.) I. Geckonidae, Eublepharidae, Uroplatidae, Pygopodidae, Agamidae*. London:450 pp.

Boulenger, G. A. 1886. Description of a new gecko of the genus *Nephrurus. Ann. Mag. nat. Hist.* (5)18:91.

Boulenger, G. A. 1913. Descriptions of new lizards in the collection of the British Museum. *Ann. Mag. nat. Hist.* (8)12:563-565.

Broom, R. 1898. On the lizards of the Chillagoe District, North Queensland. *Proc. Linn. Soc. NSW.* 22:639-645.

Brygoo, E. R. 1991. Les types de gekkonides (Reptiles, Sauriens) du Museum national d'Histoire naturelle. Catalogue critique. *Bulletin du Museum national d'Histoire naturelle, Paris A. Zoologie, biologie et ecologie animales* (4)12(3-4, supplement):19-141.

Bush, B., Maryan, B., Browne-Cooper, R. and Robinson, D. 1995. *Reptiles and Frogs of the Perth Region.* University of WA Press, Western Australia, Australia:226 pp.

Chillingworth, B. 2016. Farmer Ian Turnbull jailed for murdering environment officer Glen Turner. *Sydney Morning Herald*, 23 June, posted online at:

http://www.smh.com.au/nsw/farmer-ian-turnbull-jailed-for-murdering-environment-officer-glen-turner-20160623-gppzki.html

Cogger, H. G. 2014. *Reptiles and Amphibians of Australia*, 7th ed. CSIRO Publishing, Australia:xxx+1033 pp.

Cogger, H. G., Cameron, E. E. and Cogger, H. M. 1983. *Zoological Catalogue of Australia (1): Amphibia and Reptilia*. Australian Government Publishing Service, Canberra, ACT, Australia:313 pp.

Couper, P. J. 1994. Designation of the type species of *Saltuarius* and other data on the genus. *Memoirs of the Queensland Museum* 35(1):26.

Couper, P. J. and Gregson, R. A. M. 1994. Redescription of *Nephrurus asper* Günther, and description of *N. amyae sp. nov.* and *N. sheai sp. nov. Memoirs of the Queensland Museum* 37(1):53-67.

Couper, P. J. and Hoskin, C. J. 2013. Two new subspecies of the leaf-tailed gecko *Phyllurus ossa* (Lacertilia: Carphodactylidae) from mid-eastern Queensland, Australia. *Zootaxa* 3664:537-553.

Couper, P. J., Covacevich, J. A. and Mortiz, C. 1993. A review of the leaf-tailed geckos endemic to eastern Australia: a new genus, four new species, and other new data. *Memoirs of the Queensland Museum* 34 (1): 95-124.

Couper, P. J., Schneider, C. J. and Covacevich, J. A. 1997. A new species of *Saltuarius* (Lacertilia: Gekkonidae) from granite-based, open forests of Eastern Australia. *Memoirs of the Qeensland Museum* 42(1):91-96.

Couper, P. J., Schneider, C. J., Hoskin, C. J. and Covacevich, J. A. 2000. Australian leaf-tailed geckos: phylogeny, a new genus, two new species and other new data. *Memoirs of the Queensland Museum* 45(2): 253-265.

Couper P. J., Hamley, B. and Hoskin, C. J. 2008a. A New Species of *Phyllurus* (Lacertailia: Gekkonidae) from the Kilkivan district of South-Eastern Queensland. *Memoirs of the Queensland Museum* 52(2):139-147.

Couper, P. J., Sadlier, R. A., Shea, G. M. and Worthington Wilmer, J. 2008b. A Reassessment of *Saltuarius swaini* (Lacertilia: Diplodactylidae) in Southeastern Queensland and New South Wales; Two New Taxa, Phylogeny, Biogeography and Conservation. *Records of the Australian Museum* 60:87-118.

Court of Appeal Victoria. 2014. Hoser v Department of Sustainability and Environment [2014] VSCA 206 (5 Sept.).

Covacevich, J. 1971. Amphibian and reptile type specimens in the Queensland Museum. *Memoirs of the Queensland Museum* 16:49-68.

Covacevich, J. 1975. A review of the genus *Phyllurus* (Lacertilia: Gekkonidae). *Memoirs of the Queensland Museum* 17:293-303.

Daza, J. D. and Bauer, A. M. 2012. Temporal Bones of the Gekkota Support Molecular Relationships within the Pygopodoidea. *Journal of Herpetology* 46(3):381-386.

Delean, S. and Harvey, C. 1983. Notes on the Reproduction of *Nephrurus deleani* (Reptilia:Gekkonidae) from South Australia. *Transactions of the Royal Society of South Australia* 108(3/4):221-222.

de Vis, C. W. 1886. On certain geckos in the Queensland Museum. *Proceedings of the Linnean Society of New South Wales* (2)1(I):168-170.

Dizier, H. S. and Wret, C. 2010. On three cases of cornea ulceration on nocturnal geckonids and on the possible negative effects of UVB bulbs. *Gekko* 6(1):37-42.

Doughty, P. and Oliver, P. M. 2011. A new species of *Underwoodisaurus* (Squamata: Gekkota: Carphodactylidae) from the Pilbara region of Western Australia. *Zootaxa* 3002:20-30.

Doughty, P. and Shine, R. 1995. Life in two dimensions: natural history of the southern leaf-tailed gecko, *Phyllurus platurus. Herpetologica* 51(2):193-201.

Driscoll, D. A., Whitehead, C. A. and Lazzari, J. 2012. Spatial dynamics of the knob-tailed gecko *Nephrurus stellatus* in a fragmented agricultural landscape. *Landscape Ecology*. 27(6):829-841.

Duméril, A. M. C. and Bibron, G. 1836. *Erpetologie Générale ou Histoire Naturelle Complete des Reptiles.* Vol.3. Libr. Encyclopédique Roret, Paris:528 pp.

Duscha, D. 2007. Der australische Dickschwanzgecko, *Nephrurus milii* (*Underwoodisaurus milii*). *Draco* 8(29):44-48.

Ehmann, H. 1992. *Encyclopedia of Australian Animals: Reptiles*. Agnus and Robertson, Sydney, Australia:496 pp.

Even, E. 2005. Reptielen zoeken in Australië. *Lacerta* 63(2):48-65.

Fallend, S. 2007. Auf Geckosuche in Australien. *Draco* 8(29):78-84.

Ferguson, D. J., Mathieson, M. T. and Eyre, T. J. 2015. Additional information on the Beaded Gecko *Lucasium damaeum* and Smooth Knob-tailed Gecko *Nephrurus levis* at their eastern limit in Southwest Queensland. *Queensland Naturalist* 53(1-3):19-28.

Fitzinger, L. 1826. *Neue Classification der Reptilien nach ihren natürlichen Verwandtschaften nebst einer Verwandschafts-Tafel und einem Verzeichnisse der Reptilien-Sammlung des K. K. Zoologischen Museums zu Wien.* J. G. Heubner, Wien:66 pp.

Ford, J. 1963. The Reptilian Fauna of the Islands between Dongara and Lancelin, Western Australia. *Western Australian Naturalist* 8(6):135-142.

Galliford, M. 1981. Notes on the starred knob-tailed gecko, *Nephrurus stellatus*, caught spotlighting. *Herpetofauna* (Sydney, Australia) 12:33-34.

Garman, S. 1901. Some reptiles and batrachians from Australasia. *Bull. Mus. Comp. Zool.* Harvard 39:1-14.

Goldfuss, G. A. 1820. Reptilia. pp. 121-181 in: Schubert, G. H. *Handbuch der Naturgeschichte zum Gebrauch bei Vorlesungen.* Vol. 3. Handbuch der Zoologie. J. L. Schrag, Nürnberg.

Gray, J. E. 1825. A synopsis of the genera of reptiles and Amphibia, with a description of some new species. *Annals of Philosophy*, 10:193-217.

Gray, J. E. 1845. *Catalogue of the specimens of lizards in the collection of the British Museum*. Trustees of die British Museum/Edward Newman, London:xxvii+289 pp.

Gray, J. E. 1867. *The lizards of Australia and New Zealand in the collection of the British Museum*. Bernard Quaritich, London.

Günther, A. 1876. Descriptions of new species of reptiles from Australia collected by Hr. Dämel for the Godeffroy Museum. *Journal des Museum Godeffroy* 5(12):45-47.

Günther, A. 1897. Descriptions of new species of lizards and of a treefrog from north-eastern Queensland. *Novitates Zoologicae, Zoological Museum, Tring*, 4:403-406.

Harvey, C. 1983. A new species of *Nephrurus* (Reptilia: Gekkonidae) from South Australia. *Transactions of the Royal Society of South Australia* 107(3-4):231-235.

Harvey, M. B., Barker, D. G., Ammerman, L. K. and Chippendale, P. T. 2000. Systematics of pythons of the *Morelia amethistina* complex (Serpentes: Boidae) with the description of three new species, *Herpetological Monographs* (The Herpetologists League Incorporated) 14:139-185.

Hoser, R. T. 1989. *Australian Reptiles and Frogs*. Pierson and Co., Mosman, NSW, 2088, Australia:238 pp.

Hoser, R. T. 1991. *Endangered Animals of Australia*. Pierson Publishing, Mosman, NSW, 2088, Australia:240 pp.

Hoser, R. T. 1993. *Smuggled: The Underground Trade in Australia's Wildlife*. Apollo Publishing, Moss Vale, NSW, Australia:160 pp.

Hoser, R. T. 1996. *Smuggled-2: Wildlife Trafficking, Crime and Corruption in Australia*. Kotabi Publishing, Doncaster, Victoria, Australia:280 pp.

Hoser, R. T. 2004. Surgical Removal of Venom Glands in Australian Elapids: The creation of Venomoids. *The Herptile* 29(1):37-52.

Hoser, R. T. 2015a. Dealing with the "truth haters" ... a summary! Introduction to Issues 25 and 26 of *Australasian Journal of Herpetology*. Including "A timeline of relevant key publishing and other events relevant to Wolfgang Wüster and his gang of thieves." and a "Synonyms list". *Australasian Journal of Herpetology* 25:3-13.

Hoser, R. T. 2015b. The Wüster gang and their proposed "Taxon Filter": How they are knowingly publishing false information, recklessly engaging in taxonomic vandalism and directly attacking the rules and stability of zoological nomenclature. *Australasian Journal of Herpetology* 25:14-38.

Hoser, R. T. 2015c. Best Practices in herpetology: Hinrich Kaiser's claims are unsubstantiated. *Australasian Journal of Herpetology* 25:39-52.

Hoser, R. T, 2015d. Comments on *Spracklandus* Hoser, 2009 (Reptilia, Serpentes, ELAPIDAE): request for confirmation of the availability of the generic name and for the nomenclatural validation of the journal in which it was published (Case 3601; see *BZN* 70: 234-237; comments *BZN* 71:30-38, 133-135). (unedited version) *Australasian Journal of Herpetology* 27:37-42.

Hoser, R. T. 2015e. PRINO (Peer reviewed in name only) journals: When quality control in scientific publication fails. *Australasian Journal of Herpetology* 26:3-64.

Hoser, R. T. 2015f. Rhodin *et al.* 2015, Yet more lies, misrepresentations and falsehoods by a band of thieves intent on stealing credit for the scientific works of others. *Australasian Journal of Herpetology* 27:3-36.

Hoskin, C. J. and Couper, P. J. 2013. A spectacular new leaf-tailed gecko (Carphodactylidae: *Saltuarius*) from the Melville Range, north-east Australia. *Zootaxa* 3717(4):543-558.

Hoskin, C. J., Couper, P. J. and Schneider, C. J. 2003. A New Species of *Phyllurus* (Lacertailia: Gekkonidae) and a Revised Phylogeny and Key for the Australian Leaf-tailed Geckos. *Australian Journal of Zoology* 51(2):153-164.

How, R. A., Dell, J. and Wellington, B. D. 1991. Reproductive and dietary biology of *Nephrurus* and *Underwoodisaurus* (Gekkonidae) in Western Australia. *Records of the West Australian Museum* 14(4):449-459.

Ijzendoorn, M. v. 2007. *Underwoodisaurus milii. Lacerta* 65(2):60-67.

Kaiser, H., Crother, B. I., Kelly, C. M. R., Luiselli, L., O'Shea, M., Ota, H., Passos, P., Schleip, W. D. and Wüster, W. 2013. Best Practices: In the 21st Century, Taxonomic Decisions in Herpetology are Acceptable Only When Supported by a Body of Evidence and Published via Peer-Review. *Herpetological Review* 44(1):8-23.

Kay, G. M., Michael, D., Crane, M., Okada, S., MacGregor, C., Florance, D., Trengove, D., McBurney, L., Blair, D. and Lindenmayer, D. B. 2013. A list of reptiles and amphibians from Box Gum Grassy Woodlands in south-eastern Australia. *Check List* 9(3):476-481.

Kinghorn, J. R. 1924. Reptiles and batrachians from south and south-west Australia. *Records of the Australian Museum* 14(3):163-183.

Kinghorn, J. R. 1931. Herpetological notes 3. *Records of the Australian Museum* 18:267-269.

Kluge, A. G. 1991. Checklist of gekkonoid lizards. *Smithsonian Herpetological Information Service Bulletin*, 85:1-35.

Kluge, A. G. 1993. *Gekkonoid Lizard Taxonomy*. International Gecko Society, San Diego.

LaCépède, B. G. E. L. 1804. Mémoire sur plusieurs animaux de la Nouvelle- Hollande dont la description n'a pas encore été publiée. *Annales du Muséum National d'Histoire Naturelle*, Paris, 4:184-211.

Langner, C. 2005. *Phyllurus platurus* (WHITE). *Sauria* (Suppl.) 27(3):661-666.

Laube, A. 2001. Captive Maintenance and Breeding of Some Ground Dwelling Australian Geckos, Part 1: *Nephrurus laevissimus* and *Nephrurus levis. Gekko* 2(1):30-36.

Laube, A. 2002. Captive Maintenance and Breeding of Some Ground Dwelling Australian Geckos Part III: *Nephrurus amyae* COUPER, 1994. *Gekko* 3(1):43-48.

Laube, A. 2006. *Der australische Dickschwanzgecko, Underwoodisaurus milii. Natur und Tier Verlag* (Münster):64 pp.

Laube, A. 2007. Erfahrungen bei der Haltung und Vermehrung von *Nephrurus amyae* COUPER AND GREGSON, 1994. *Sauria* 29(1):15-21.

Laube, A. and Langner, C. 2007a. Die "Geckos" Australiens. *Draco* 8(29):4-21.

Laube, A. and Langner, C. 2007b. Die australischen Riesenblattschwanzgeckos der Gattung *Saltuarius. Draco* 8(29):67-77.

Laube, A. and Langner, C. 2013. *Der grosse raue Knopfschwanzgecko,* Nephrurus amyae. Natur und Tier Verlag:64 pp.

Laube, A. and Porter, R. 2004. Captive Maintenance and Breeding of Some Ground Dwelling Australian Geckos Part IV: *Underwoodisaurus milii* (Bory de Saint-Vincent, 1823) and *Underwoodisaurus sphyrurus* (Ogilby, 1892). *Gekko* 4(1):23-32.

LiVigni, F. (ed.) 2013. *A Life for Reptiles and Amphibians*, Volume 1. Chimaira, Frankfurt:495 pp.

Longman, H. A. 1918. Notes on some Queensland and Papuan reptiles. *Memoirs of the Queensland Museum* 6:37-44.

Love, B. 2010. Amphibien und Reptilien fotografieren – mit Stil. *Reptilia* (Münster) 15(84):84-85.

Love, B. 2012. Auf Reptiliensuche in Australien. *Reptilia* (Münster) 17(95):18-19.

Love, B. 2014. Die unsichtbare Arche. *Reptilia* (Münster) 19(107):14-15.

Loveridge, A. 1932. New lizards of the genera *Nephrurus* and *Amphibolurus* from Western Australia. *Proc. New England zool. Club* 13:31-34.

Loveridge, A. 1934. Australian reptiles in the Museum of Comparative Zoology, Cambridge, Massachusetts. *Bull. Mus Comp. Zool.* Harvard 77:243-383.

Loveridge, A. 1947. Revision of the African lizards of the family Gekkondiae. *Bull. Mus. Comp. Zool.* Harvard 98:1-469.

Maddock, S. T., Ellis, R. J., Doughty, P., Smith, L. A. and Wüster, W. 2015. A new species of death adder (*Acanthophis*: Serpentes: Elapidae) from north-western Australia. *Zootaxa* 4007(3):301-326 (online publication).

Merrem, B. 1820. *Versuch eines Systems der Amphibien I (Tentamen Systematis Amphibiorum).* J. C. Kriegeri, Marburg:191 pp.

Mertens, R. 1958. Neue Eidechsen aus Australien. *Senckenbergiana Biologica* 39:51-56.

Mertens, R. 1967. Die herpetologische Sektion des Natur-Museums und Forschungs-Institutes Senckenberg in Frankfurt am Main nebst einem Verzeichnis ihrer Typen. *Senckenbergiana Biologica* 48:1-106.

Mo, M. 2014. Habitat selection of the Broad-tailed Gecko *Phyllurus platurus* in an urban Sydney bushland remnant. *Australian Zoologist* 37(1):95-101.

Mo, M. 2015. Herpetofaunal community of the constructed Lime Kiln Bay Wetland, south Sydney, New South Wales. *Victorian Naturalist* 132(3):64-72.

Moritz, C., Joseph, L. and Adams, M. 1993. Cryptic diversity in an endemic rainforest skink (*Gnypetoscincus queenslandiae*). *Biodiversity and Conservation* 2:412-425.

Ogilby, J. D. 1892. Descriptions of three new Australian lizards. *Rec. Austral. Mus.* 2:6-11.

Oliver, P. M. and Bauer, A. M. 2011. Systematics and evolution of the Australian knob-tail geckos (*Nephrurus*, Carphodactylidae, Gekkota): Pleisomorphic grades and biome shifts through the Miocene. *Molecular Phylogenetics and Evolution* 59(3):664-674.

Pianka, E. R. 1969. Habitat specificity, speciation, and species density in Australian desert lizards. *Ecology* 50(3):498-502.

Pianka, E. R. and Vitt, L. J. 2003. *Lizards:Windows to the Evolution of Diversity.* University of California Press, Berkeley, California, USA:347 pp.

Porter, R. 2002. The Husbandry and First Recorded Captive Breeding of the Chameleon Gecko, *Carphodactylus laevis* Günther,1897. *Gekko* 2(2):2-8.

Read, J. 1998. Hemmed in on all sides? The status of the restricted gecko, *Nephrurus deleani. Herpetofauna* (Australia) 28(2):30-38.

Ride, W. D. L. (*ed.*) *et al.* (on behalf of the International Commission on Zoological Nomenclature) 1999. *International code of Zoological Nomenclature* (Fourth edition). The Natural History Museum - Cromwell Road, London SW7 5BD, UK (also commonly cited as "The Rules", "Zoological Rules" or "ICZN 1999").

Rochebrune, A. T. de 1884. *Faune de la Senegambie. Reptiles.* O. Dom, Paris:221 pp.

Rösler, H. 1985. Zum Vorhandensein von Präanalporen bei *Phyllurus cornutus* (OGILBY, 1892). *Sauria* 7(4):29-30.

Rösler, H. 1995. Geckos der Welt - Alle Gattungen. *Urania*, Leipzig:256 pp.

Rösler, H. 2000. Kommentierte Liste der rezent, subrezent und fossil bekannten Geckotaxa (Reptilia: Gekkonomorpha). *Gekkota* 2:28-153.

Rudge, J. 2004. Introducing Those Other Leaf-tails. *Gekko* 4(1):33-34.

Schenk, S. 2009. Scheinpaarung bei zwei Weibchen des australischen Geckos *Nephrurus levis levis* de Vis, 1889 im Terrarium. *Sauria* 31(2):57-59.

Schinz, H. R. 1822. *Das Thierreich eingetheilt nach dem Bau der Thiere als Grundlage ihrer Naturgeschichte und der vergleichenden Anatomie von dem Herrn Ritter von Cuvier.* Vol. 2. J. G. Cotta, Stuttgart.

Schneider, J. G. 1797. *Amphibiorum Physiologiae Specimen Alterum Historiam et Species Generis Stellionum seu Geckonum Sistens*. Frankfurt (Oder), C. L. F. Aitzi (2):30.

Schönecker, P. 2007. Biologie, Haltung und Nachzucht des australischen Knopfschwanzgeckos *Nephrurus amyae. Draco* 8(29):39-43.

Shaw, G. and Nodder, F. P. (eds.) 1791. The Naturalist's Miscellany [...], Vol. II. London, Nodder and Co., plates 38- 74, 157 unnumbered pages [published in monthly issues between August 1, 1790, and July 1, 1791].

Shea, G. M. 2002. The Identity of *Phyllurus milii* Bory de Saint Vincent, 1823 (Squamata: Pygopodidae: Diplodactylinae). *Records of the Western Australian Museum* 20:431-435.

Shea, G. M. and Sadlier, R. A. 1999. A catalogue of the non-fossil amphibian and reptile type specimens in the collection of the Australian Museum: types currently, previously and purportedly present. *Technical Reports of the Australian Museum* 15:91 pp.

Spix, J. B. von 1825. *Animalia nova sive species nova lacertarum quas in itinere per Brasiliam annis MDCCCXVII-MDCCCXX jussu et auspicius Maximiliani Josephi I Bavariae Regis suscepto collegit et descripsit Dr. J. B. de Spix*. Lipsiae: T. O. Weigel; F. S. Hübschmanni, Monachii:26 pp.

Storr, G. M. 1963. The gekkonid genus *Nephrurus* in Western Australia, including a new species and three new subspecies. *Journal of the Royal Society of Western Australia*, 46:85-90.

Storr, G. M. 1968. *Nephrurus stellatus*, A new knob-tailed gecko from southern Australia. *West. Australian Naturalist* 10:180-182.

Storr, G. M., Smith, L. A. and Johnstone, R. E. 1990. *Lizards of Western Australia III Geckos and Legless Lizards.* W.A. Museum, Perth, WA, Australia:141 pp.

Swan, G., Shea, G. and Sadlier, R. 2009. *A field guide to reptiles of New South Wales*, Second Edition, Reed/New Holland, Chatswood, NSW, Australia:304 pp.

Swan, M. 2008. *Keeping and Breeding Australian Lizards*. Mike Swan Herp Books, Lilydale, Victoria, Australia:615 pp.

Swainson, W. 1839. *The natural history of fishes, amphibians and reptiles, or monocardian animals*. Vol. 2. Longman, Orme, Brown, Green and Longmans, London, UK.

Swanson, S. 1976. *Lizards of Australia*. Angus and Robertson, Sydney:80 pp.

Torr, G. A. 1998. A low elevation record for the rainforest gecko *Carphodactylus laevis* and a further addition to the herpetofauna of the Mossman Gorge section of Daintree National Park, QLD. *Herpetofauna* (Australia) 28(1):53.

Underwood, G. A. 1954. On the classification and evolution of geckos. *Proc. of the Zoological Society of London* 124: 469-492.

Victorian Civil and Administrative Tribunal (VCAT). 2015. *Hoser v Department of Environment Land Water and Planning* (Review and Regulation) [2015] VCAT 1147 (30 July 2015, judgement and transcript).

Wells, R. W. and Wellington, C. R. 1983. A synopsis of the class Reptilia in Australia. *Australian Journal of Herpetology* 1(3-4):73-129.

Wells, R. W. and Wellington, C. R. 1985. A classification of the Amphibia and Reptilia of Australia. *Australian Journal of Herpetology Supplementary Series* 1:1-61.

Wermuth, H. 1965. Liste der rezenten Amphibien und Reptilien Gekkonidae, Pygopodidae, Xantusiidae. *Das Tierreich* 80(1-22):1-246 [ix, 47].

Werner, Y. L. 2008. Tales of Tails. *Gekko* 5(2):6-18.

White, J. 1790. *Journal of a voyage to New South Wales, with sixty-five plates of non descript animals, birds, lizards, serpents, curious cones of trees and other natural productions*. Debrett, London:229 pp.

Wilson, S. K. 2015. *A field guide to the Reptiles of Queensland.* New Holland Publishers, Chatswood, NSW, Australia:304 pp.

Wilson, S. K. and Knowles, D. G. 1988. *Australia's Reptiles: A Photographic Reference to the Terrestrial Reptiles of Australia.* Cornstalk Publishing, Pymble, NSW, Australia:447 pp.

Wilson, S. and Swan, G. 2010. *A complete guide to reptiles of Australia*, 3rd ed. New Holland, Chatswood, NSW, Australia:558 pp.

Zietz, F. R. 1920. Catalogue of Australian lizards. *Records of the South Australian Museum* 1:181-228.

CONFLICT OF INTEREST

The author has no known conflicts of interest in terms of this paper and conclusions within.

Carphodactylidae: Revised arrangement and content.

CARPHODACTYLIDAE

TRIBE CARPHODACTYLINI *TRIBE NOV.*

Content: *Carphodactylus* Günther, 1897 (monotypic).

Genus: *Carphodactylus* Günther, 1897.

Content: *Carphodactylus laevis* Günther, 1897 (type species); *C. hoserae sp. nov*.

TRIBE ORRAYINI *TRIBE NOV.*

Content: *Orraya* Couper, Covacevich, Schneider and Hoskin, 2000 (monotypic).

Genus: *Orraya* Couper, Covacevich, Schneider and Hoskin, 2000.

Content: *Orraya occulta* (Couper, Covacevich and Moritz, 1993).

TRIBE NEPHRURIINI *TRIBE NOV.*

Content: *Nephrurus* Günther, 1876; *Underwoodisaurus* Wermuth, 1965; *Uvidicolus* Oliver and Bauer, 2011.

SUBTRIBE NEPHRURIINA *SUBTRIBE NOV.*

Content: *Nephrurus* Günther, 1876; *Underwoodisaurus* Wermuth, 1965.

Genus: *Nephrurus* Günther, 1876.

Content (Subgenera): *Nephrurus* Günther, 1876; *Quazinephrurus subgen. nov.*; *Paranephrurus subgen. nov..*

Subgenus *Nephrurus* Günther, 1876.

Content: *Nephrurus asper* Günther, 1876 (type species); *N. amyae* Couper, 1994; *N. blacki sp. nov.*; *N. sheai* Couper, 1994.

Subgenus: *Quazinephrurus subgen. nov.*

Content: *Nephrurus* (*Quazinephrurus*) *levis* De Vis, 1886 (type species); *N.* (*Quazinephrurus*) *coreyrentoni sp. nov.*; *N.* (*Quazinephrurus*) *deleani* Harvey, 1983; *N.* (*Quazinephrurus*) *ianrentoni sp. nov.*; *N.* (*Quazinephrurus*) *laevissimus* Mertens, 1958; *N.* (*Quazinephrurus*) *occidentalis* Storr, 1963; *N.* (*Quazinephrurus*) *stellatus* Storr, 1968; *N.* (*Quazinephrurus*) *vertebralis* Storr, 1963.

Subgenus: *Paranephrurus subgen. nov.*

Content: *Nephrurus* (*Paranephrurus*) *wheeleri* Loveridge, 1932 (type species); *N.* (*Paranephrurus*) *cinctus* Storr, 1963.

Genus *Underwoodisaurus* Wermuth, 1965.

Content: *Underwoodisaurus milii* (Bory de Saint-Vincent, 1825) (type species); *U. asper* (Boulenger, 1913); *U. husbandi* Wells and Wellington (1983); *U. mensforthi sp. nov.*; *U. perthensis sp. nov.*; *U. seorsus* Doughty and Oliver, 2011.

SUBTRIBE *UVIDICOLINA SUBTRIBE NOV.*

Content: *Uvidicolus* Oliver and Bauer, 2011.

Genus: *Uvidicolus* Oliver and Bauer, 2011.

Content: *Uvidicolus sphyrurus* (Ogilby, 1892) (type species); *U. covacevichae sp. nov.*

TRIBE SHIREENGECKIINI *TRIBE NOV.*

Content: *Shireengecko gen. nov.*; *Couperus gen. nov.*; *Oxygecko gen. nov.*; *Phyllurus* Schinz, 1822; *Saltuarius* Couper, Covacevich and Moritz, 1993; *Teesgecko gen. nov.*.

SUBTRIBE OXYGECKOINA *SUBTRIBE NOV.*

Content: *Oxygecko gen. nov.*; *Couperus gen. nov.*; *Phyllurus* Schinz, 1822; *Teesgecko gen. nov.*.

Genus: *Oxygecko gen. nov.*

Content: *Oxygecko amnicola* (Hoskin, Couper, Schneider and Covacevich, 2000) (type species); *O. gulbaru* (Hoskin, Couper and Schneider, 2003).

Genus: *Couperus gen. nov.*

Content: *Couperus caudiannulatus* (Covacevich, 1975); *C. kabikabi* (Couper, Hamley and Hoskin, 2008).

Genus *Phyllurus* Schinz, 1822.

Content: *Phyllurus platurus* (White ex Shaw, 1790) (monotypic at present).

Genus: *Teesgecko gen. nov.*

Content: *Teesgecko nepthys* (Couper, Covacevich and Moritz, 1993) (type species); *T. championae* (Schneider, Couper, Hoskin and Covacevich, 2000); *T. isis* (Couper, Covacevich and Moritz, 1993); *T. ossa* (Couper, Covacevich and Moritz, 1993).

SUBTRIBE SHIREENGECKIINA *SUBTRIBE NOV.*

Content: *Shireengecko gen. nov.*; *Saltuarius* Couper, Covacevich and Moritz, 1993.

Genus: *Shireengecko gen. nov.*

Content (Subgenera): *Shireengecko subgen. nov.*; *Quazishireengecko subgen. nov.*.

Subgenus: *Shireengecko subgen. nov.*

Content: *Shireengecko* (*Shireengecko*) *wyperba* Couper, Schneider and Covacevich, 1997 (type species); *S.* (*Shireengecko*) *kateae* (Couper, Sadlier, Shea and Worthington Wilmer, 2008); *S.* (*Shireengecko*) *moritzi* (Couper, Sadlier, Shea and Worthington Wilmer, 2008).

Subgenus: *Quazishireengecko subgen. nov.*

Content: *S.* (*Quazishireengecko*) *swaini* (Wells and Wellington, 1985) (monotypic).

Genus: *Saltuarius* Couper, Covacevich and Moritz, 1993.

Content (Subgenera): *Saltuarius* Couper, Covacevich and Moritz, 1993; *Quazisaltuarius subgen. nov.*.

Subgenus: *Saltuarius* Couper, Covacevich and Moritz, 1993.

Content: *Saltuarius* (*Saltuarius*) *cornutus* (Ogilby, 1892) (type species); *S.* (*Saltuarius*) *adelynae sp. nov.*; *S. eximius* Hoskin and Couper, 2013.

Subgenus: *Quazisaltuarius subgen. nov..*

Content: *S.* (*Quazisaltuarius*) *salebrosus* (Covacevich, 1975); *S.* (*Quazisaltuarius*) *jackyae sp. nov.*.

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A division of the genus *Corucia* Gray, 1855, the Giant Skink, from the Solomon Islands, into five geographically separated species.

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ABSTRACT

For more than 100 years, the Solomon Islands skink genus *Corucia* Gray, 1855 has been viewed by virtually all herpetologists as being comprised of a single species, namely *C. zebrata* Gray, 1855, type locality San Cristobal.

This view was shaken somewhat in 1997 when Köhler described the subspecies *C. zebrata alfredschmidti*, from Bougainville, a designation which appears to have been widely accepted in the pet trade, but not so much in the scientific literature.

Following on from a molecular study of Hagen *et al*. (2012) which showed that the "species" *Corucia zebrata* Gray, 1855 in fact consists of five divergent lineages, this paper provides the results of inspections of numerous specimens from across the Solomon Islands, which shows five variants which correspond to the clades identified by Hagen *et al.* (2012).

Two correspond with each of *Corucia zebrata* Gray, 1855 and *C. zebrata alfredschmidti* Köhler, 1997, while the other three have been until now, unnamed.

On the basis of deep phylogenetic divergences in excess of a million years for each group and ongoing geographical isolation by bodies of sea-water that the lizards cannot easily cross, with no ongoing evidence of cross-sea migrations, combined with obvious physical differences between each population, the five populations are each treated as full species that continue to evolve separately.

These are *C. zebrata* Gray, 1855, being the type form for the genus *Corucia* from San Cristobel, *C. alfredschmidti* (Köhler, 1997) from the Bougainville Group of islands, including Shortland Island, *C. hoserae sp. nov.* from Guadalcanal, *C. woolfi sp. nov.* from the New Georgia group of islands and Choiseul and *C. elfakhariorum sp. nov.* from Ngela (AKA Nggela) and Santa Isabel.

Keywords: Taxonomy; Nomenclature; Lizards; Giant Skink; genus; *Corucia*; species; *zebrata*; *alfredschmidti*; new species; *hoserae*; *woolfi*; *elfakhariorum*; Solomon Islands; Solomons; Guadalcanal; Ngela; Nggela, Shortland; Malaita; San Cristobal; Makira; New Georgia; Santa Isabel; Choiseul; Florida Islands; Guadalcanal; Bougainville.

INTRODUCTION

For more than 100 years, the Solomon Islands skink genus *Corucia* Gray, 1855 has been viewed by virtually all herpetologists as being comprised of a single species, namely *C. zebrata* Gray, 1855, type locality San Cristobal.

In fact for more than a century, no one bothered to inspect specimens from across the Solomon Islands with a view to ascertaining differences between specimens from different islands.

This view was shaken in 1997 when Köhler described the subspecies *C. zebrata alfredschmidti*, from Bougainville.

This designation appears to have been widely accepted in the pet trade, but not so much in the scientific literature, where it has sometimes been referred to, but not necessarily used as correct (e.g. McCoy 2006 and Hagen *et al.* 2012).

Put simply, professional herpetologists appear to have been preoccupied with other matters, rather than to look at these lizards from a taxonomic viewpoint.

Following on from a molecular study of Hagen *et al.* (2012) which showed that the "species" *Corucia zebrata* Gray, 1855 in fact consists of five significantly divergent lineages, this paper provides the results of inspections of numerous (many dozens of) specimens from across the Solomon Islands, which shows five variants which correspond to the clades identified by Hagen *et al.* (2012).

This had been deduced by myself prior to the publication of

Hagen *et al.* but ongoing matters including litigation that commenced in one form or other in 2006 delayed publication of my results indefinitely (see Court of Appeal Victoria 2014 and VCAT 2015 for an overview).

Specimens (with accurate locality data) were inspected from the following islands: Guadalcanal, Ngela (AKA Nggela), Shortland, Malaita, San Cristobal, New Georgia, Santa Ana, Santa Isabel, Choiseul, Florida Islands, Guadalcanal, Makira, Bougainville.

McCoy (2006) lists other islands *Corucia* are also found including some from which I did not view specimens (see list of locations below with Buka Island added).

Two clades correspond with each of *Corucia zebrata* Gray, 1855 and *C. zebrata alfredschmidti* Köhler, 1997, while the other three have been until now, unnamed.

On the basis of deep phylogenetic divergences in excess of a million years for each group as found by Hagen *et al.* (2012) and ongoing geographical isolation by bodies of sea-water that the lizards cannot easily cross, with no ongoing evidence of cross-sea migrations and obvious physical differences between each population, the five populations are each treated as full species that continue to evolve separately.

Significant and ignored by taxonomists since 1995, was a paper by Balsai (1995) summarizing his studies which found that specimens from different islands when mated, failed to produce offspring. This further indicative of each form being a different species in the accepted Darwinian sense of the term.

These five herein defined forms are *C. zebrata* Gray, 1855, being the type form for the genus *Corucia* from San Cristobel, *C. alfredschmidti* (Köhler, 1997) from the Bougainville Group of islands, including Shortland Island, *C. hoserae sp. nov.* from Guadalcanal, *C. woolfi sp. nov.* from the New Georgia group of islands and Choiseul and *C. elfakhariorum sp. nov.* from Ngela (AKA Nggela) and Santa Isabel.

Divergences were ascertained on the basis of previous ice-age maxima connections between relevant islands as explained by authors such as Bruns *et al.* (2009), Russell and Coupe (1984) and sources cited within and more recently corroborated by the molecular results of Hagen *et al.* (2012) for these very lizards.

Notwithstanding the theft of relevant materials from this author in an illegal armed raid on 17 August 2011, which were not returned (Court of Appeal Victoria 2014 and VCAT 2015), I have made a decision to publish this paper in view of the conservation significance attached to the formal recognition of unnamed species and on the basis that further delays may in fact put these unnamed taxa at greater risk of extinction.

This noting the ongoing human population growth in the Solomon Islands and the associated influences of habitat destruction and potential for introduced pests and pathogens to attack vulnerable island populations.

The five distinctive forms herein are also given taxonomic recognition on the basis that likely divergences exceed the timeline determined as significant and worthy of conservation recognition by Keogh *et al.* (2003).

Hagen *et al.* (2012) also noted that rafting between islands is not viewed as a significant means of dispersal or ongoing gene flow, beyond times of initial colonisation.

The inability of the genus to disperse beyond the Solomon Islands also supports this view.

MATERIALS AND METHODS

These are not formally explained in a number of my recent papers under the heading "Materials and methods" or similar, on the basis they are self evident to any vaguely perceptive reader. However, the process by which the following taxonomy and nomenclature in this and other recent papers by myself of similar form, has been arrived at, is explained herein for the benefit of people who have recently published so-called "criticisms" online of some of my recent papers. They have alleged a serious "defect" by myself in not formally explaining "Materials And Methods" under such a heading.

The process involved in creating the final product for this and other relevant papers has been via a combination of the following:

Genera and component species are audited to see if their classifications are correct on the basis on known type specimens, locations and the like when compared with known phylogenies and obvious morphological differences between like species.

Original descriptions and contemporary concepts of the species are matched with available specimens from across the ranges of the species to see if all conform to accepted norms.

These may include those held in museums, private collections, collected in the field, photographed, posted on the internet or held by individuals, and only when the location data is good and any other useful and relevant data is available.

Where specimens do not appear to comply with the described species (and accepted concept of the species), this non-conformation is looked at with a view to ascertaining if it is worthy of taxonomic recognition or other relevant considerations on the basis of differences that can be tested for antiquity or deduced from earlier studies.

When this appears to be the case (non-conformation), the potential target taxon is inspected as closely as practicable with a view to comparing with the nominate form or forms if other similar taxa have been previously named.

Other relevant data is also inspected, including any available molecular studies which may indicate likely divergence of populations.

Where molecular studies are unavailable for the relevant taxon or group, other studies involving species and groups constrained by the same geographical or geological barriers, or with like distribution patterns are inspected as they give reasonable indications of the likely divergences of the taxa being studied herein.

Additionally other studies involving geological history, sea level and habitat changes associated with long-term climate change, including recent ice age changes in sea levels, versus known sea depths are utilized to predict past movements of species and genus groups in order to further ascertain likely divergences between extant populations (as done in this very paper).

When all available information checks out to show taxonomically distinct populations worthy of recognition, they are then recognized herein according to the rules of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999).

This means that if a name has been properly proposed in the past, it is used. This exactly what happens in this paper for the taxon originally described as *Corucia zebrata alfredschmidti* Köhler, 1997.

Alternatively, if no name is available, a new one is proposed according to the rules of the *International Code of Zoological Nomenclature* as is done three times in this paper.

As a matter of trite I mention that if a target taxon or group does check out as being "in order" or properly classified, a paper is usually not published unless some other related taxon is named for the first time.

The published literature relevant to the taxonomic judgements made within this paper includes papers relevant to Solomon Islands species affected by the same physical barriers to dispersion as well as those directly relevant to *Corucia.* Combined, they include the following:

Adler *et al.* (1995), Austin *et al.* (2010), Balsai (1995), Barbour (1921), Bonetti (2002), Boseto and Pikacha (2016), Boulenger (1884, 1886, 1887), Brenneman *et al.* (2007), Bruns *et al.* (1989), Coborn (1996), Dahl (1986), de Vosjoli (1993), Duméril and Bibron (1839), Gray (1856), Greer and Parker (1967), Greer and Simon (1982), Hagen and Bull (2011), Hagen *et al.* (2012, 2013), Hall (2002), Hauschild (1998), Iskandar and Erdelen

(2006), Jungfer and Jansen (1985), Keogh *et al.* (2003), Kinghorn (1928), Kirkpatrick (1996), Köhler (1997), Lima *et al.* (2011), Mann and Meek (2004), McCoy (1980, 2006), McDowell (1970, 1979), Moser (1992), Mys (1988), Parker (1983), Pianka and Vitt (2003), Pyron *et al.* (2013), Reeder (2003), Rittmeyer and Austin (2015), Russell and Coupe (1984), Schmidt (1998), Schmidt (1932), Sprackland (1993), Wright (1996, 2007), Ziegler (2005), Zollweg (2013), Zweifel (1966), and sources cited therein.

For the benefit of readers who wish to see standard examples of each of the newly described taxa within this paper, within the above references, (e.g. McCoy 1980, 2006 and Hagen *et al.* 2012) are photos of standard specimens of all five of the described forms herein with accurate locality information. McCoy (2006) correctly noted taxonomic assessments based on captive specimens outside the Solomon Islands “cannot be regarded with any certainty” and I have subscribed to this view by excluding from my analysis any such specimens.

Notwithstanding this, I have not had difficulty ascertaining the provenance of captive animals based on the species criteria below with a strong degree of certainty and in the absence of any other information.

Due to requirements for valid descriptions as stated within the *International Code of Zoological Nomenclature* and relevant rulings by the ICZN, some material is repeated within this paper and I make no apologies for this.

GENUS *CORUCIA* GRAY, 1855.

Type species: *Corucia zebrata* Gray, 1855.

Diagnosis: Until now the genus has been treated as monotypic. The genus *Corucia* is defined and separated from all other skinks as follows: Large wedge-shaped head, distinct from the robust body, limbs are well-developed and with strong claws. The tail is slender and prehensile. The lower eyelid is scaly. The frontonasal is the largest head shield. No supranasals. Prefrontals are in contact or narrowly separated and if so, by a small median scale. Parietals are widely separated, bordered by one or more pairs of enlarged temporals. Nuchals are usually enlarged. Frontoparietals are distinct.

Head shields are commonly generally irregular and vary from one individual to the next. 35-40 mid-body scale rows, 19-22 lamellae under the fourth toe.

Each of the five herein recognized species are diagnosed below.

Distribution: Endemic to the Solomon Islands archipelago, including Bougainville, Buka, Shortland Islands, Choiseul, Vella Lavella, New Georgia, Tetepare, Vangunu, Santa Isabel, Guadalcanal, Ngela (AKA Nggela), Malaita, Makira (AKA San Cristobal), Ugi, Santa Ana (as mainly derived from McCoy 2006).

Content: *Corucia zebrata* Gray, 1855 (type species); *C. alfredschmidti* (Köhler, 1997); *C. elfakhariorum sp. nov.*; *C. hoserae sp. nov.*; *C. woolfi sp. nov.*.

***CORUCIA ZEBRATA* GRAY, 1855.**

Type locality: Makira Island (San Cristobal), Solomon Islands.

Diagnosis: The species *Corucia zebrata* Gray, 1855 is separated from others in the genus by the following unique suite of characters: Greenish to greenish-orange iris; Lighter scales on the limbs forming distinct bands. Most of the tail lacks any distinctive markings except for the anterior which has lighter scales arranged to give thin, jagged light cross bands across a brownish-grey background. There is significant lightening towards the snout including the upper labials which are a light yellowish colour. There are distinct dark and light markings on the rear of the head corresponding to dark etchings and whitish centres of the major head shields. The venter is usually an indistinct pattern of lighter and darker greyish brown.

The species *C. alfredschmidti* (Köhler, 1997) is separated from others in the genus by the following unique suite of characters: A dark yellow iris. Limbs and tail are greyish in colour but with irregular dark spots being composed of individual scales. It has a distinctive green colouration on the head (sometimes yellowish green), including the underside, which is punctuated by small irregular blackish blotches. The venter is whitish, sometimes with faint irregular markings.

The species *C. hoserae sp. nov.* is separated from others in the genus by the following unique suite of characters: Generally greyish in colour, including on the limbs and tail, which have no significant distinct markings. The upper body is covered with an indistinct pattern. The head is generally a plain greyish colour with irregular scattered indistinct darker markings. The iris is a greenish colour, sometimes slightly yellowish near the centre. The venter may or may not be patterned but is usually a light greyish colour.

The species *C. woolfi sp. nov.* is in many respects similar to *C. alfredschmidti* (Köhler, 1997) but is separated that species and from others in the genus by the following unique suite of characters: Yellow head, yellow iris, lighter blotches down the flanks forming indistinct and broken longitudinal stripes, irregular black dots formed by single scales on the limbs. Unlike *C. alfredschmidti* (Köhler, 1997) *C. woolfi sp. nov.* does not have a dorsal body pattern including large blackish spots caused by one or more blackened scales. *C. woolfi sp. nov.*, *C. hoserae sp. nov.* and *Corucia zebrata* Gray, 1855 are all characterised by a dorsal surface with small black flecks only configured in an irregular pattern.

The venter of *C. woolfi sp. nov.* is usually a light and indistinct pattern of lighter and darker yellowish white.

C. elfakhariorum sp. nov. is diagnosed and separated from others in the genus by the following unique suite of characters: The dorsal colouration in adults is generally plain and unmarked save for a scattering of darker (single scale) spots, these also being only semidistinct. There is no patterning anywhere, save for a faded blotch-like patterning on the dorsal upper body, which is easily overlooked. Legs are either unmarked, or sometimes punctuated by a small number of dark or black single scale spots on each limb, the number never being more than 3 on any limb. The underside is an off-white colour. The iris is yellowish-green, as is the head, but the head often fades to become greyish-brown in adults. The lower labials and chin shields are characterised by a peppering of dark, over a lighter, whitish background. Similar peppering is also found on the upper surface of the head which is darkish in colour and otherwise unmarked.

The colour of the sclera of the eye appears to vary within a given population, being either black or white (including in populations of *C. alfredschmidti*) and so is not treated as diagnostic for one or other species.

Distribution: *Corucia zebrata* Gray, 1855 is found on Makira Island (San Cristobal) and Malaita, Solomon Islands.

***CORUCIA ALFREDSCHMIDTI* KÖHLER, 1855.**

Type locality: Bougainville Islands group, Solomon Islands.

Diagnosis: The species *Corucia alfredschmidti* (Köhler, 1997) is separated from others in the genus by the following unique suite of characters: A dark yellow iris. Limbs and tail are greyish in colour but with irregular dark spots being composed of individual scales. It has a distinctive green colouration on the head (sometimes yellowish green), including the underside which is punctuated by small irregular blackish blotches. The venter is whitish, sometimes with faint irregular markings.

The species *C. zebrata* Gray, 1855 is separated from others in the genus by the following unique suite of characters: Greenish to greenish-orange iris; Lighter scales on the limbs forming distinct bands. Most of the tail lacks any distinctive markings except for the anterior which has lighter scales arranged to give thin, jagged light cross bands across a brownish-grey background. There is significant lightening towards the snout including the upper labials which are a light yellowish colour. There are distinct dark and light markings on the rear of the head corresponding to dark etchings and whitish centres of the major head shields. The venter is usually an indistinct pattern of lighter and darker greyish brown.

The species *C. hoserae sp. nov.* is separated from others in the genus by the following unique suite of characters: Generally greyish in colour, including on the limbs and tail, which have no significant distinct markings. The upper body is covered with an indistinct pattern. The head is generally a plain greyish colour with irregular scattered indistinct darker markings. The iris is a greenish colour, sometimes slightly yellowish near the centre. The venter may or may not be patterned but is usually a light greyish colour.

The species *C. woolfi sp. nov.* is in many respects similar to *C. alfredschmidti* (Köhler, 1997) but is separated that species and from others in the genus by the following unique suite of characters: Yellow head, yellow iris, lighter blotches down the flanks forming indistinct and broken longitudinal stripes, irregular black dots formed by single scales on the limbs. Unlike *C. alfredschmidti* (Köhler, 1997) *C. woolfi sp. nov.* does not have a dorsal body pattern including large blackish spots caused by one or more blackened scales. *C. woolfi sp. nov.*, *C. hoserae sp. nov.* and *Corucia zebrata* Gray, 1855 all characterised by a dorsal surface with small black flecks only configured in an irregular pattern. The venter of *C. woolfi sp. nov.* is usually a light and indistinct pattern of lighter and darker yellowish white.

C. elfakhariorum sp. nov. is diagnosed and separated from others in the genus by the following unique suite of characters: The dorsal colouration in adults is generally plain and unmarked save for a scattering of darker (single scale) spots, these also being only semidistinct. There is no patterning anywhere, save for a faded blotch-like patterning on the dorsal upper body, which is easily overlooked. Legs are either unmarked, or sometimes punctuated by a small number of dark or black single scale spots on each limb, the number never being more than 3 on any limb. The underside is an off-white colour. The iris is yellowish-green, as is the head, but the head often fades to become greyish-brown in adults. The lower labials and chin shields are characterised by a peppering of dark, over a lighter, whitish background. Similar peppering is also found on the upper surface of the head which is darkish in colour and otherwise unmarked.

The colour of the sclera of the eye appears to vary within a given population, being either black or white (including in populations of *C. alfredschmidti*) and so is not treated as diagnostic for one or other species.

Distribution: *Corucia alfredschmidti* (Köhler, 1997) is found in the Bougainville Group of islands, including Buka and Shortland islands, within the Solomon Islands archipelago.

CORUCIA HOSERAE SP. NOV.

Holotype: A preserved specimen at the Australian Museum, Sydney, NSW, Australia, specimen number: R.137063 (the first of the series collected) collected at Makarakomburu (South Slope), Guadalcanal, Solomon Islands (9°45'S, 160°00'E). The Australian Museum, Sydney, NSW, Australia is a public facility that allows access to its specimen holdings.

Diagnosis: The species *Corucia hoserae sp. nov.* is separated from others in the genus by the following unique suite of characters: Generally greyish in colour dorsally, including on the limbs and tail, which have no significant distinct markings. The upper body is covered with an indistinct pattern, but with a scattering of indistinct black flecks, which are sometimes more numerous on the flanks of the body. The head is generally a plain greyish colour with irregular scattered indistinct darker markings, but usually presents at a glance as unmarked. The iris is a greenish colour, sometimes slightly yellowish near the centre. The venter may or may not be patterned but is usually a light greyish colour.

The species *C. zebrata* Gray, 1855 is separated from others in the genus by the following unique suite of characters: Greenish to greenish-orange iris; lighter scales on the limbs forming distinct bands. Most of the tail lacks any distinctive markings except for the anterior which has lighter scales arranged to give thin, jagged light cross bands across a brownish-grey background. There is significant lightening towards the snout including the upper labials which are a light yellowish colour. There are distinct dark and light markings on the rear of the head corresponding to dark etchings and whitish centres of the major head shields. The venter is usually an indistinct pattern of lighter and darker greyish brown.

The species *C. alfredschmidti* (Köhler, 1997) is separated from others in the genus by the following unique suite of characters: A dark yellow iris. Limbs and tail are greyish in colour but with irregular dark spots being composed of individual scales. It has a distinctive green colouration on the head (sometimes yellowish green), including the underside, which is punctuated by small irregular blackish blotches. The venter is whitish, sometimes with faint irregular markings.

The species *C. woolfi sp. nov.* is in many respects similar to *C. alfredschmidti* (Köhler, 1997) but is separated that species and from others in the genus by the following unique suite of characters: Yellow head, yellow iris, lighter blotches down the flanks forming indistinct and broken longitudinal stripes, irregular black dots formed by single scales on the limbs. Unlike *C. alfredschmidti* (Köhler, 1997) *C. woolfi sp. nov.* does not have a dorsal body pattern including large blackish spots caused by one or more blackened scales. *C. woolfi sp. nov.*, *C. hoserae sp. nov.* and *C. zebrata* Gray, 1855 are characterised by a dorsal surface with small black flecks only that are configured in an irregular pattern. The venter of *C. woolfi sp. nov.* is usually a light and indistinct pattern of lighter and darker yellowish white.

C. elfakhariorum sp. nov. is diagnosed and separated from others in the genus by the following unique suite of characters: The dorsal colouration in adults is generally plain and unmarked save for a scattering of darker (single scale) spots, these also being only semidistinct. There is no patterning anywhere, save for a faded blotch-like patterning on the dorsal upper body, which is easily overlooked. Legs are either unmarked, or sometimes punctuated by a small number of dark or black single scale spots on each limb, the number never being more than 3 on any limb. The underside is an off-white colour. The iris is yellowish-green, as is the head, but the head often fades to become greyish-brown in adults. The lower labials and chin shields are characterised by a peppering of dark, over a lighter, whitish background. Similar peppering is also found on the upper surface of the head which is darkish in colour and otherwise unmarked.

The colour of the sclera of the eye appears to vary within a given population, being either black or white (including in populations of *C. alfredschmidti*) and so is not treated as diagnostic for one or other species.

The genus *Corucia* is defined and separated from all other skinks as follows: Large wedge-shaped head, distinct from the robust body, limbs are well-developed and with strong claws. The tail is slender and prehensile. The lower eyelid is scaly. The frontonasal is the largest head shield. No supranasals. Prefrontals are in contact or narrowly separated and if so, by a small median scale. Parietals are widely separated, bordered by one or more pairs of enlarged temporals. Nuchals are usually enlarged. Frontoparietals are distinct.

Head shields are commonly generally irregular and vary from one individual to the next. 35-40 mid-body scale rows, 19-22 lamellae under the fourth toe.

Distribution: Guadalcanal in the Solomon Islands, and immediately adjacent islets, not including the Florida Islands group.

Etymology: Named in honour of my mother, Katrina Hoser of Sydney, NSW, Australia in recognition of her many decades services to herpetology.

CORUCIA WOOLFI SP. NOV.

Holotype: A preserved specimen at the Australian Museum, Sydney, NSW, Australia, specimen number: 134945, (the first of the series collected), collected at Mt. Javi, 5km north of Patutiva Village, Marovo Lagoon, New Georgia, Solomon Islands (8°31'S, 157°52'E).

The Australian Museum, Sydney, NSW, Australia is a public facility that allows access to its specimen holdings.

Paratype: A preserved specimen at the Australian Museum, Sydney, NSW, Australia, specimen number: R.134946 (the first of the series collected), collected at Tamaneke Village, Marovo Lagoon, New Georgia, Solomon Islands (8°19'S, 157°49'E).

Diagnosis: The species *Corucia woolfi sp. nov.* is in many respects similar to *C. alfredschmidti* (Köhler, 1997) as described below, but is separated that species and from others in the genus by the following unique suite of characters: Yellow head, yellow iris, lighter blotches down the flanks forming indistinct and broken longitudinal stripes, irregular black dots formed by single scales on the limbs. Unlike *C. alfredschmidti* (Köhler, 1997) *C. woolfi sp. nov.* does not have a dorsal body pattern including large blackish spots caused by one or more blackened scales. *C. woolfi sp. nov.*, *C. hoserae sp. nov.* and *C. zebrata* Gray, 1855 are all characterised by a dorsal surface with small black flecks only configured in an irregular pattern. The venter of *C. woolfi sp. nov.* is usually a light and indistinct pattern of lighter and darker yellowish white.

The species *C. alfredschmidti* (Köhler, 1997) is separated from others in the genus by the following unique suite of characters: A dark yellow iris. Limbs and tail are greyish in colour but with irregular dark spots being composed of individual scales. It has a distinctive green colouration on the head (sometimes yellowish green), including the underside, which is punctuated by small irregular blackish blotches. The venter is whitish, sometimes with faint irregular markings.

The species *C. zebrata* Gray, 1855 is separated from others in the genus by the following unique suite of characters: Greenish to greenish-orange iris; Lighter scales on the limbs forming distinct bands. Most of the tail lacks any distinctive markings except for the anterior which has lighter scales arranged to give thin, jagged light cross bands across a brownish-grey background. There is significant lightening towards the snout including the upper labials which are a light yellowish colour. There are distinct dark and light markings on the rear of the head corresponding to dark etchings and whitish centres of the major head shields. The venter is usually an indistinct pattern of lighter and darker greyish brown.

The species *C. hoserae sp. nov.* is separated from others in the genus by the following unique suite of characters: Generally greyish in colour dorsally, including on the limbs and tail, which have no significant distinct markings. The upper body is covered with an indistinct pattern, but with a scattering of indistinct black flecks. The head is generally a plain greyish colour with irregular scattered indistinct darker markings. The iris is a greenish colour, sometimes slightly yellowish near the centre. The venter may or may not be patterned but is usually a light greyish colour.

C. elfakhariorum sp. nov. is diagnosed and separated from others in the genus by the following unique suite of characters: The dorsal colouration in adults is generally plain and unmarked save for a scattering of darker (single scale) spots, these also being only semidistinct. There is no patterning anywhere, save for a faded blotch-like patterning on the dorsal upper body, which is easily overlooked. Legs are either unmarked, or sometimes punctuated by a small number of dark or black single scale spots on each limb, the number never being more than 3 on any limb. The underside is an off-white colour. The iris is yellowish-green, as is the head, but the head often fades to become greyish-brown in adults. The lower labials and chin shields are characterised by a peppering of dark, over a lighter, whitish background. Similar peppering is also found on the upper surface of the head which is darkish in colour and otherwise unmarked.

The colour of the sclera of the eye appears to vary within a given population, being either black or white (including in populations of *C. alfredschmidti*) and so is not treated as diagnostic for one or other species.

The genus *Corucia* is defined and separated from all other skinks as follows: Large wedge-shaped head, distinct from the robust body, limbs are well-developed and with strong claws. The tail is slender and prehensile. The lower eyelid is scaly. The frontonasal is the largest head shield. No supranasals. Prefrontals are in contact or narrowly separated and if so, by a small median scale. Parietals are widely separated, bordered by one or more pairs of enlarged temporals. Nuchals are usually enlarged. Frontoparietals are distinct.

Head shields are commonly generally irregular and vary from one individual to the next. 35-40 mid-body scale rows, 19-22 lamellae under the fourth toe.

Distribution: The New Georgia group of islands in the Western District of the Solomon Islands and Choiseul, Solomon Islands.

Etymology: Named in honour of Paul Woolf, of Walloon, near Brisbane, Queensland, Australia in recognition of his many decades services to herpetology including as foundation president of the Herpetological Society of Queensland (HSQI Inc.).

CORUCIA ELFAKHARIORUM SP. NOV.

Holotype: A preserved specimen at the Australian Museum, Sydney, NSW, Australia, specimen number: R.76041, collected at Boromole, Nggela Sule, (Ngela), Solomon Islands (9°03' S, 160°18' E).

The Australian Museum, Sydney, NSW, Australia is a public facility that allows access to its specimen holdings.

Paratypes: Two preserved specimens at the Australian Museum, Sydney, NSW, Australia, specimen numbers: R.9291 and R9292 from Government Station Ysabel (AKA Santa Isabel), Solomon Islands (8° 23' S, 159° 48' E).

Diagnosis: *Corucia elfakhariorum sp. nov.* is diagnosed and separated from others in the genus by the following unique suite of characters: The dorsal colouration in adults is generally plain and unmarked save for a scattering of darker (single scale) spots, these also being only semidistinct. There is no patterning anywhere, save for a faded blotch-like patterning on the dorsal upper body, which is easily overlooked. Legs are either unmarked, or sometimes punctuated by a small number of dark or black single scale spots on each limb, the number never being more than 3 on any limb. The underside is an off-white colour. The iris is yellowish-green, as is the head, but the head often fades to become greyish-brown in adults. The lower labials and chin shields are characterised by a peppering of dark, over a lighter, whitish background. Similar peppering is also found on the upper surface of the head which is darkish in colour and otherwise unmarked.

The species *C. zebrata* Gray, 1855 is separated from others in the genus by the following unique suite of characters: Greenish to greenish-orange iris; Lighter scales on the limbs forming distinct bands. Most of the tail lacks any distinctive markings except for the anterior which has lighter scales arranged to give thin, jagged light cross bands across a brownish-grey background. There is significant lightening towards the snout including the upper labials which are a light yellowish colour. There are distinct dark and light markings on the rear of the head corresponding to dark etchings and whitish centres of the major head shields. The venter is usually an indistinct pattern of lighter and darker greyish brown.

The species *C. alfredschmidti* (Köhler, 1997) is separated from others in the genus by the following unique suite of characters: A dark yellow iris. Limbs and tail are greyish in colour but with irregular dark spots being composed of individual scales. It has a distinctive green colouration on the head (sometimes yellowish green), including the underside, which is punctuated by small irregular blackish blotches. The venter is whitish, sometimes with faint irregular markings.

The species *C. woolfi sp. nov.* is in many respects similar to *C. alfredschmidti* (Köhler, 1997) as described below, but is separated that species and from others in the genus by the following unique suite of characters: Yellow head, yellow iris, lighter blotches down the flanks forming indistinct and broken longitudinal stripes, irregular black dots formed by single scales on the limbs. Unlike *C. alfredschmidti* (Köhler, 1997) *C. woolfi sp. nov.* does not have a dorsal body pattern including large blackish spots caused by one or more blackened scales. *C. woolfi sp. nov.*, *C. hoserae sp. nov.* and *C. zebrata* Gray, 1855 are all characterised by a dorsal surface with small black flecks only configured in an irregular pattern. The venter of *C. woolfi sp. nov.* is usually a light and indistinct pattern of lighter and darker yellowish white.

The species *C. hoserae sp. nov.* is separated from others in the genus by the following unique suite of characters: Generally greyish in colour dorsally, including on the limbs and tail, which have no significant distinct markings. The upper body is covered with an indistinct pattern, but with a scattering of indistinct black flecks. The head is generally a plain greyish colour with irregular scattered indistinct darker markings. The iris is a greenish colour, sometimes slightly yellowish near the centre. The venter may or may not be patterned but is usually a light greyish colour.

The colour of the sclera of the eye appears to vary within a given population, being either black or white (including in populations of *C. alfredschmidti*) and so is not treated as diagnostic for one or other species.

The genus *Corucia* is defined and separated from all other skinks as follows: Large wedge-shaped head, distinct from the robust body, limbs are well-developed and with strong claws. The tail is slender and prehensile. The lower eyelid is scaly. The frontonasal is the largest head shield. No supranasals. Prefrontals are in contact or narrowly separated and if so, by a small median scale. Parietals are widely separated, bordered by one or more pairs of enlarged temporals. Nuchals are usually enlarged. Frontoparietals are distinct.

Head shields are commonly generally irregular and vary from one individual to the next. 35-40 mid-body scale rows, 19-22 lamellae under the fourth toe.

Distribution: The islands Ngela (AKA Nggela) and the Florida Islands group, Choiseul and Santa Isabel, including immediately adjacent islets in the Solomon Islands.

Etymology: Named in honour of three brothers, Moses, Akram and Danny El-Fakhari of Northcote, Victoria, Australia in recognition of their significant logistical contributions to herpetology spanning some decades, reconstruction of Lebanon after the civil war that ended around 1990 and a many years involvement in public service through their taxi-cab business in Melbourne, Victoria, Australia, which involves carting inebriated people home in taxi-cabs so that they do not drive home drunk and kill other innocent people.

NOTES ON THE DESCRIPTIONS FOR ANY POTENTIAL REVISORS

Unless mandated by the rules of the *International Code of Zoological Nomenclature*, none of the spellings of the newly proposed names should be altered in any way. Should one or more newly named taxa be merged by later authors to be trated as a single species, the order of prority of retention of names should be as follows: *hoserae*; *woolfi*; *elfakhariorum*, which is the order (page priority) of the descriptions within this text.

REFERENCES CITED

Adler, G. H., Austin, C. C. and Dudley, R. 1995. Dispersal and speciation of skinks among archipelagos in the tropical Pacific Ocean. *Evolutionary Ecology* 9:529-541.

Austin, C. C., Rittmeyer, E. N., Richards, S. J. and Zug, G. R. 2010. Phylogeny, historical biogeography and body size evolution in Pacific Island Crocodile skinks *Tribolonotus* (Squamata; Scincidae). *Molecular Phylogenetics and Evolution* 57(1):227-236.

Balsai, M. J. 1995. Husbandry and Breeding of the Solomon Islands Prehensile-tailed Skink, *Corucia zebrata*. *The Vivarium* 7(1):4-11.

Barbour, T. 1921. Reptiles and amphibians from the British Solomon Islands. *Proc. New England zool. Club* 7:91-112.

Bonetti, M. 2002. *100 Sauri.* Mondadori (Milano), 192 pp.

Boseto, D. and Pikacha, P. (eds.) 2016. A. report on baseline biodiversity inventory of Mount Maetambe to Kolobangara River Corridor, Choiseul Island, Solomon Islands. Downloaded from the website of Ecological Solutions Solomon Islands at: http://ecologicalsolutions-si.com/files/110494600.pdf

Boulenger, G. A. 1884. Diagnoses of new reptiles and batrachians from the Solomon Islands, collected and presented to the British Museum by H. B. Guppy, Esq., M. B., H. M. S. 'Lark.'. *Proc. Zool. Soc. London* 1884:210-213.

Boulenger, G. A. 1886. On the reptiles and batrachians of the Solomon Islands. *Trans. Zool. Soc. London* 12:35-62.

Boulenger, G. A. 1887. *Catalogue of the Lizards in the British Museum (Nat. Hist.) III. Lacertidae, Gerrhosauridae, Scincidae, Anelytropsidae, Dibamidae, Chamaeleontidae.* London:575pp.

Brenneman, R. A., Engberg, S. E., Shore, G. D. and Louis, E. E. Jr. 2007. Primer Note: Characterization of 21 microsatellite marker loci in the prehensile-tailed skink (*Corucia zebrata*). *Molecular Ecology Notes* 7:1281-1283.

Bruns, T. R., Vedder, J. R. and Cooper, A. K. 1989. Geology of the Shortland Basin Region, Central Solomons Trough, Solomon Islands - Review and New Findings. pp. 125-144 in Vedder, J.G. and Bruns, T. R., (eds.), 1989. Geology and offshore resources of Pacific island arcs Solomon Islands and Bougainville, Papua New Guinea Regions: Houston, Texas, Circum-Pacific Council for Energy and Mineral Resources, Earth Science Series, v. 12.

Coborn, J. 1996. *Prehensile-Tailed Skinks*. TFH Publications, USA: 64 pp.

Court of Appeal Victoria. 2014. Hoser v Department of Sustainability and Environment [2014] VSCA 206 (5 September 2014).

Dahl, A. L. 1986. *Review of the protected areas system in Oceania*. IUCN/UNEP, Gland, Switzerland.

de Vosjoli, P. 1993. *The General Care and Maintenance of Prehensile-tailed Skinks*. Lakeside, CA: Advanced Vivarium Systems, USA:58 pp.

Duméril, A. M. C. and Bibron, G. 1839. *Erpétologie Générale on Histoire Naturelle Complète des Reptiles*. Vol.5. Roret/Fain et Thunot, Paris:871 pp.

Gray, J. E. 1856. New genus of fish-scaled lizards (Scissosarae) from New Guinea. *Ann. Mag. Nat. Hist.* (2)18:345-346.

Greer, A. E. and Parker, F. 1967. A new scincid lizard from the northern Solomon Islands. *Breviora* (275):1-20.

Greer, A. E. and Simon, M. 1982. *Fojia bumui*, an unusual new genus and species of scincid lizard from New Guinea. *Journal of Herpetology* 16(2):131-139.

Hagen, I. J. and Bull, C. M. 2011. Home Ranges in the Trees: Radiotelemetry of the Prehensile Tailed Skink, *Corucia zebrata. Journal of Herpetology* 45(1):36-39.

Hagen, I. J., Donnellan, S. C. and Bull, M. 2012. Phylogeography of the prehensile-tailed skink *Corucia zebrata* on the Solomon Archipelago. *Ecology and Evolution* (2012), 2(6):1220-1234.

Hagen, I. J., Herfindal, I., Donnellan, S. C. and Bull, M. C. 2013. Fine Scale Genetic Structure in a Population of the Prehensile Tailed Skink, *Corucia zebrata. Journal of Herpetology* 47(2):308-313.

Hall, R., 2002. Cenozoic geological and plate tectonic evolution of SE Asia and the SW Pacific: computer-based reconstructions, model and animations. *J. Asian Earth Sci.* 20:353-431.

Hauschild, A. 1998. *Corucia zebrata* GRAY, 1855. *Sauria* 20 Suppl.:421-426.

Iskandar, D. T. and Erdelen, W. R. 2006. Conservation of amphibians and reptiles in Indonesia: issues and problems. *Amphibian and Reptile Conservation* 4(1):60-87.

Jungfer, K. -H. and Jansen, M. 1985. Der Wickelskink. *Herpetofauna* 7(36):22.

Keogh, S. J., Scott, A. W., Fitzgerald, M. and Shine, R. 2003. Molecular phylogeny of the Australian venomous snake genus *Hoplocephalus* (Serpentes, Elapidae) and conservation genetics of the threatened *H. stephensii*. *Conservation Genetics* 4:57-65.

Kinghorn, J. R. 1928. Herpetology of the Solomon Islands. *Rec. Austral. Mus.* 16:123-178.

Kirkpatrick, D. T. 1996. Observations on Mating Behavior of the Solomon Island Skink. *Reptile and Amphibian Magazine* 7(5):24-31.

Köhler, G. 1997. Eine neue Unterart des Wickelschwanzskinkes *Corucia zebrata* von Bougainvillle, Papua-Neuguinea. *Salamandra* 33(1):61-68.

Lima, A., Höss, S., Elser, G., Kühne, H., Glaw, F. and Vences, M. 2011. Vorläufige Untersuchungen zur genetischen Variabilität beim Wickelschwanzskink. *Elaphe* 19(3):6-10.

Mann, S. L. and Meek, R. 2004. Understanding the relationship between body temperature and activity patterns in the giant Solomon Island skink, *Corucia zebrata*, as a contribution to the effectiveness of captive breeding programmes. *Applied Herpetology* 1(3):287-298.

McCoy, M. 1980. *Reptiles of the Solomon Islands*. Wau Ecology Institute Handbook 7. Wau Ecology Institute, Wau, Papua New Guinea.

McCoy, M. 2006. *Reptiles of the Solomon Islands*. Pensoft Series Faunistica 57:212 pp.

McDowell, S. B. 1970. On the status and relationships of the Solomon Island elapid snakes. *Journal of Zoology*, London 161:145-190.

McDowell, S. B. 1979. A catalogue of the snakes of New Guinea and the Solomons, with special reference to those in the Bernice P. Bishop Museum. Part III. Boinae and Acrochordoidea (Reptilia: Serpentes). *Journal of Herpetology* 13:1-92.

Meyer, J. 2002. Einige Bemerkungen zur Haltung und Nachzucht von Helmskinken der Art *Tribolonotus gracilis* (DE ROOIJ 1909). *Herpetofauna* 24(139):28-34.

Moser, K. 1992. The Prehensile-tailed Skink, *Corucia zebrata* Gray: Care, Behavioral Observations, and Reproduction. *Contributions in Herpetology* (Cincinnati, Ohio, Greater Cincinnati Herpetological Society): 85-89.

Mys, B. 1988. The zoogeography of the scincid lizards from North Papua New Guinea (Reptilia: Scincidae). I. The distribution of the species. *Bull. Inst. Roy. Sci. Nat. Belgique* (Biologie) 58:127-183.

Parker, F. 1983. The prehensile-tailed skink (*Corucia zebrata*) on Bougainville Island, Papua New Guinea. *Advances in Herpetology and Evolutionary Biology* (Cambridge: Harvard University Press):435-440.

Pianka, E. R. and Vitt, L. J. 2003. *Lizards - Windows to the Evolution of Diversity.* University of California Press, Berkeley:347 pp.

Pyron, R. A., Burbrink, F. T. and Wiens, J. J. 2013. A phylogeny and revised classification of Squamata, including 4161 species of lizards and snakes. *BMC Evolutionary Biology* 13:93.

Reeder, T. W. 2003. A phylogeny of the Australian *Sphenomorphus* group (Scincidae: Squamata) and the phylogenetic placement of the crocodile skinks (*Tribolonotus*): Bayesian approaches to assessing congruence and obtaining confidence in maximum likelihood inferred relationships. *Molecular Phylogenetics and Evolution* 27:384-397.

Ride, W. D. L. (*ed.*) *et al.* (on behalf of the International Commission on Zoological Nomenclature) 1999. *International code of Zoological Nomenclature* (Fourth edition). The Natural History Museum - Cromwell Road, London SW7 5BD, UK (also commonly cited as “The Rules”, “Zoological Rules” or “ICZN 1999”).

Rittmeyer, E. N. and Austin, C. C. 2015. Combined next-generation sequencing and morphology reveal fine-scale speciation in Crocodile Skinks (Squamata: Scincidae: *Tribolonotus*). *Mol Ecol.* 2015 Jan, 24(2):466-83. doi: 10.1111/mec.13030. Epub 2015 Jan 9.

Russell, E. and Coupe, S. 1984. *The Macquarie World Illustrated Atlas.* Kevin Weldon, Macquarie Library, Chatswood, NSW, Australia:511 pp.

Schmidt, A. A. 1998. Weitere Anmerkungen zur Rassenbildung und Geschlechtsunterscheidung von *Corucia zebrata. Elaphe* 6(2):2-5.

Schmidt, K. P. 1932. Reptiles and Amphibians from the Solomon Islands. *Field Mus. Nat. Hist. Zool. Ser.* 18(9):175-190.

Sprackland, R. 1993. The Solomon Islands Prehensile-tailed Skink (*Corucia zebrata*). *Reptiles*:24-28.

VCAT (Victorian Civil and Administrative Tribunal). 2015. *Hoser v Department of Environment Land Water and Planning* (Review and Regulation) [2015] VCAT 1147 (30 July 2015).

Wright, K. M. 1996. The Solomon Island Skink. *Reptile and Amphibian Magazine* 3(2):10-19.

Wright, K. M. 2007. Captivating Giants. *Reptiles Magazine* 15(12):54-68.

Ziegler, T. 2005. Nachzuchterfolge 2002 im Aquarium des Kölner Zoos. *Herpetofauna* (Münster) 25(142):22-24 [2003/2004].

Zollweg, M. Z. 2013. Wickelschwanzskinke – oder: Manche sind gleich, andere sind gleicher. *Reptilia* (Münster) 18(104):50-58.

Zweifel, R. G. 1966. A New Lizard of the Genus *Tribolonotus* (Scincidae) from New Britain. *American Museum Novitates* 2264:1-12.

CONFLICT OF INTEREST

The author has no known conflicts of interest in terms of this paper and conclusions within.

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A re-evaluation of the Crocodile Skinks, genus *Tribolonotus* Duméril and Bibron, 1839 *sensu lato* including the division of the genus into three, description of three new species, a new subspecies and the placement of all within a new tribe.

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ABSTRACT

The Lygosominae, Crocodile Skinks genus *Tribolonotus* Duméril and Bibron, 1839 as currently recognized consists of eight described species. A related genus, *Fojia* Greer and Simon, 1982 consists of a single species *Fojia bumui* Greer and Simon, 1982.

Molecular studies have shown the some of the known species of *Tribolonotus* (type species *Zonurus novaeguineae* Schlegel, 1834), to be significantly divergent from one another in spite of morphological similarities and distributional proximity (Austin *et al*. 2010).

As a result of these studies, a re-assessment of the morphology of the relevant species and comparison with the geographical and geological records of the Solomon Islands, it is clear that the assemblage needs to be divided (as do some other species complexes in the area).

At the genus level *Tribolonotus* needs to be divided in order to maintain relative parity as compared to other skink genera from the Australo-Papuan region in terms of their relative divergences.

Therefore, *Tribolonotus* as currently recognized is herein divided into three genera, namely *Tribolonotus*, for the New Guinea species, *Quazitribolonotus gen. nov.* for *T. blanchardi* Burt, 1930 and two similar species formally described herein, namely *Q. frankanthonyi sp. nov*. and *Q. tomlonsdalei sp. nov.*, and the genus *Feretribolonotus gen. nov*. for the rest of the species formerly within *Tribolonotus.*

Feretribolonotus gen. nov. is further divided into two subgenera, the other named *Propetribolonotus subgen. nov.* to accommodate the divergent species "*Tribolonotus brongersmai* Cogger, 1972".

All of these and *Fojia* are in turn placed in a newly named tribe Tribolonotiini *tribe nov.*. *Fojia* is also placed into a subtribe Fojiina *subtribe nov.*.

The species described as *Tribolonotus pseudoponceleti* Greer and Parker, 1968, is divided into two based on criteria set out by Greer and Parker (1968) and (Austin *et al*. 2010).

The Buka Island population is formally named *Feretribolonotus greeri sp. nov.*.

Kar Kar Island and Huon Peninsula specimens of *Tribolonotus gracilis* de Rooij, 1909 being significantly different in form to the nominate race, and divergent genetically are herein described as a new subspecies, *T. gracilis karkarensis sp. nov*..

Keywords: Taxonomy; lizards; Tribe; new tribe; Tribolonotiini; new subtribe; Fojiina; genus; genera; *Tribolonotus*; Solomon Islands; Solomons; Guadalcanal; Bougainville; Nggela; new genus; *Quasitribolonotus*; *Feretribolonotus*; new subgenus; *Propetribolonotus*; new species; Buka Island; *greeri*; *frankanthonyi*; *tomlonsdalei*; new subspecies; *karkarensis*.

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INTRODUCTION

The so-called Crocodile Skinks *Tribolonotus* Duméril and Bibron, 1839 are found in New Guinea and islands to the north, including the Bismarck Archipelago, and the Solomon Islands.

The genus *Tribolonotus* as currently recognized consists of eight described species all of which superficially at least appear to be morphologically similar. A related genus, *Fojia* Greer and Simon, 1982 consists of a single species *Fojia bumui* Greer and Simon, 1982, but as noted in the original description, clearly shares affinities with *Tribolonotus* to the exclusion of all other genera. Molecular studies have shown that some of the known species of *Tribolonotus* to be significantly divergent from one another in spite of morphological similarities and distributional proximity (Austin *et al.* 2010).

Pyron *et al.* (2013) found much the same in their more wide-ranging squamate phylogeny and showed the depth of divergence between the relevant species-level taxa to be significant.

As a result of these studies and a re-assessment of the morphology of the relevant species, it is clear that at the genus level, the assemblage needs to be divided in order to maintain relative parity as compared to other skink genera from the Australo-Papuan region in relation to divergences and generic placements.

This is most easily seen when comparing this group with other species and genera on the Pyron *et al.* (2013) figures.

Therefore, *Tribolonotus* as currently recognized is herein divided into three genera and one of these into subgenera in accordance with the *International Code of Zoological Nomenclature* (Ride *et al*. 1999).

All of these and *Fojia* are in turn placed in a newly named tribe Tribolonotiini *tribe nov.*. *Fojia* is also placed into a subtribe called Fojiina *subtribe nov.*.

Quazitribolonotus gen. nov. is the new genus name applied to the *T. blanchardi* (Burt, 1930) complex. Until now this has been treated as a single species, but is herein divided three ways.

Q. frankanthonyi sp. nov. and *Q. tomlonsdalei sp. nov.* are the two newly named species and occur in biologically distinct land zones within the Solomon Islands.

Feretribolonotus gen. nov. is the generic name now applied to the following species: *T. annectens* Zwiefel, 1966, *T. brongersmai* Cogger, 1972, *T. ponceleti* Kinghorn, 1937, *T. pseudoponceleti* Greer and Parker, 1968 as well as *Feretribolonotus greeri sp. nov.* (described below) and *T. schmidti* Burt, 1930. The divergent species *T. schmidti* Burt, 1930 is unique among the species in the tribe in being a live bearer, as opposed to laying eggs and is placed in the subgenus *Proptribolonotus subgen. nov.*.

Tribolonotus Duméril and Bibron, 1839 is herein restricted to the two New Guinea species, namely *Tribolonotus novaeguineae* (Schlegel, 1834) (the type species) and *T. gracilis* De Rooij, 1909.

The relevant divisions outlined above also have a robust morphological basis to support them as a further reason why I have no hesitation in breaking up the genus as currently recognized.

The species *T. pseudoponceleti* Greer and Parker, 1968 (herein placed in the new genus *Feretribolonotus gen. nov.*) was shown by both Greer and Parker (1968) and (Austin *et al*. 2010) to consist of two distinct populations.

This is formally divided into two species based on criteria set out by Greer and Parker (1968) and (Austin *et al*. 2010).

In the case of these taxa, I have married the molecular data of Austin *et al.* (2010), with the morphological data of Greer and Parker (1968) to identify the unnamed taxon and provide a description of it in compliance with the rules of the *International Code of Zoological Nomenclature* (Ride *et al*. 1999).
The Buka Island population is formally named *Feretribolonotus greeri sp. nov.*.
Inspection of a large number of *T. gracilis* de Rooij, 1909 from the general region they occur (northern New Guinea), showed the presence of two distinct geographically disjunct morphs.

T. gracilis de Rooij, 1909 is known from two main populations, this assertion being based on records of Australian Museum holdings for the species and other available records (e.g. Austin *et al.* 2010).

One population is found in a region generally west of Wewak, PNG, along the coast into Irian Jaya. This is the nominate form. Besides this, another significant population is known from Kar Kar Island and nearby parts of the mainland in the Madang province, centred on the Huon Peninsula. These are morphologically distinct from the nominate form, most easily distinguished by the configuration of bright orange-red markings around the eye and the positioning of a flattened ridge running backwards from the eye.
Molecular data of Austin *et al.* (2010) also confirms divergence of these lizards from the nominate population by a degree worthy of subspecies recognition. The area between the two populations is the general lower Sepik River basin, which is an area of lowlands and swamps and clearly unsuitable habitat for the species and so the absence of records can be reliably attributed to an absence of specimens, as opposed to a mere absence of collecting. The Sepik valley barrier would have been formed and maintained as the northern landmasses accreted to the New Guinea landmass in the last 5 million years as described by Hall (2002) and adapted by Austin *et al.* (2010).

Furthermore the geologically recently created hilly regions in northern New Guinea which is where the species occurs is not connected to the central cordillera of New Guinea, these being separated by a wide area of lowlands and so specimens from the east and west populations do not have an obvious bridge by which to get from one population to another.
Well established geological evidence suggests a division of the populations by more than a million years (somewhere under 4 million years) and this divergence is of the order recognized by many authorites as being worthy of taxonomic recognition (e.g. Keogh *et al*., 2003).

Keogh *et al*., (2003), found populations of Stephens Banded Snakes *H. stephensi* Krefft, 1869 to have diverged some 800,000 years ago and went on to state that "managers should treat the Queensland and NSW populations of *H. stephensi* as separate conservation units".

In the absence of known intermediates and a divergence greater than a million years, it is appropriate that the two populations of *T. gracilis* be afforded taxonomic recognition. The unnamed taxon is therefore described herein as *T. gracilis karkarensis subsp. nov.*.
The species *T. blanchardi* Burt, 1930 as recognized to date, is clearly the most divergent in the group from the Solomon Islands and as mentioned already is herein placed in the genus *Quazitribolonotus gen. nov.*.

The known populations clearly sit within three currently known well-defined groups. These are a largely montane dwelling form from Bougainville, the nominate form known from Choisuel and a third form known from Nggela and Guadalcanal. Based on their obvious differences in form (including colour variants) and habits, they are formally divided into species.

Molecular evidence, not available at present, will I anticipate support my position.

This can be pre-empted with a high degree of probability (but not certainty) on the following grounds.
The three populations of *Quazitribolonotus blanchardi* (Burt, 1930), herein divided are significantly divergent in habits, that cannot be merely explained by location, which is both proximal and in the recent geological past connected by land bridges.
The allopatry of species is based on a demonstrated lack of dispersal in these lizards as shown by the current distribution of the tribe.

Even at times of reduced sea levels, during glacial maxima, potentially emergent land bridges between the relevant islands in the Solomons, in recent Pleistocene times would not have had habitat conducive to migration between the current island masses as seen by the sea floor evidence provided by Bruns *et al.* (2009). Habitat in the form of watercourses would have drained off the islands to the sea and not across newly emergent potential landbridges, which would have been largely flattish and not habitat for these lizards.

Two populations described herein, would in any event perhaps not have been connected via a land bridge even at times of lowest sea levels and so the genetic isolation would have been maintained.
Furthermore, similar species in the tribe (e.g. *F. ponceleti* Kinghorn, 1937 and *F. pseudoponceleti* (Greer and Parker, 1968)) appear to maintain allopatric distributions, even when in potential contact, as seen by evidence provided by Austin *et al.* (2010) and Greer and Parker (1968).
In spite of the other clade (genus) from the Solomons, namely

Feretribolonotus gen. nov. being able to disperse as far afield as New Britain and Manus Island, *Quazitribolonotus gen. nov.* has been unable to disperse beyond the Solomons arc and within this region appears to be more restricted in habitats than *Feretribolonotus gen. nov.* as explained by Greer and Parker (1968).

This genus (*Quazitribolonotus gen. nov.*) remains confined to the arc of islands running from Ngela (AKA Nggela) in the south-east to Bougainville in the north-west (McCoy 2006).

Absence of *Quazitribolonotus gen. nov.* specimens from intermediate or nearby islands in the Solomons also appears to be a result of absence of lizards as opposed from non-collection or being overlooked, based on evidence of unsuccessful targeted searches as outlined by Austin *et al.* (2010).

The other islands are also generally separated by sea depths greater than the lowest sea levels in recent ice age maxima (estimated at about 120 metres), as seen in the maps provided by Russell and Coupe (1984).

References relevant to the taxonomic conclusions in this paper include the following: Adler, *et al.* (1995), Austin *et al.* (2010), Balsai (1995), Bonetti (2002), Boulenger (1887), Boseto and Pikacha (2016), Bruns *et al.* (1989), Burt (1930), Burt and Burt (1932), Charlier (1999), Cogger (1972), de Rooij (1909, 1915, 1919), Dost (2001), Duméril and Bibron (1839), Evers (2006, 2010), Greer (1982), Greer and Parker (1967), Greer and Simon (1982), Hagen *et al.* (2012), Hall (2002), Iskandar and Erdelen (2006), Keogh *et al.* (2003), Kinghorn (1937), McCoy (1980, 2006), McDowell (1970), Meyer (2002, 2012), Miralles (2004), Mys (1988), Parker (1940), Peters (1970), Pianka and Vitt (2003), Reeder (2003), Rittmeyer and Austin (2015), Roux (1930), Russell and Coupe (1984), Schlegel (1834), Zweifel (1966) and sources cited therein.

A new formal description of the genus *Tribolonotus* Duméril and Bibron, 1839, as defined within this paper is effectively contained within the descriptions of the genera *Quazitribolonotus gen. nov.* and *Feretribolonotus gen. nov.*).

I also note that, notwithstanding the theft of relevant materials from this author in an illegal armed raid on 17 August 2011, which were not returned (Court of Appeal Victoria 2014 and VCAT 2015), I have made a decision to publish this paper in view of the conservation significance attached to the formal recognition of unnamed species and on the basis that further delays may in fact put these unnamed taxa at greater risk of extinction due to extensive habitat destruction in the relevant areas.

MATERIALS AND METHODS

These are not formally explained in a number of my recent papers under the heading “Materials and methods” or similar, on the basis they are self evident to any vaguely perceptive reader. However, the process by which the following taxonomy and nomenclature in this and other recent papers by myself has been arrived at is explained herein for the benefit of people who have recently published so-called “criticisms” of some of my recent papers. They have alleged a serious “defect” by myself not formally explaining “Materials and methods” under such a heading.

The process involved in creating the final product for this and other relevant papers has been via a combination of the following:

Genera and component species are audited to see if their classifications are correct on the basis on known type specimens, locations and the like.

Original descriptions and contemporary concepts of the species are matched with available specimens from across the ranges of the species to see if all conform to accepted norms.

These may include those held in museums, private collections, collected in the field, photographed, posted on the internet or held by individuals and only when the location data is good and with any other relevant data available.

Where specimens do not appear to comply with the described species (and accepted concept of the species), this non-conformation is looked at with a view to ascertaining if it is worthy of taxonomic recognition or other relevant considerations.

When this appears to be the case (non-conformation), the potential target taxon is inspected as closely as practicable with a view to comparing with the nominate form or forms and other relevant data is also inspected, including any available molecular studies which may indicate likely divergence of populations.

Where molecular studies are unavailable for the relevant taxon or group, other studies involving species and groups such as genera, constrained by the same geographical or geological barriers, or with like distribution patterns are inspected as they give reasonable indications of the likely divergences of the taxa being studied herein.

Additionally other studies involving geological history, sea level and habitat changes associated with long-term climate change are also utilized to predict past movements of species and genus groups in order to further ascertain likely divergences between extant populations (as done in this very paper).

When all available information checks out to show taxonomically distinct populations worthy of recognition, they are then recognized herein according to the rules of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999).

This means that if a name has been properly proposed in the past, it is used. Alternatively, if none is available, one is proposed according to the rules of the Code as is done several times in this paper.

As a matter of trite I mention that if a target taxon or group does check out as being “in order” or properly classified, a paper is usually not published.

The “results” are of course the taxonomic judgements made herein.

QUAZITRIBOLONOTUS GEN. NOV.

Type species: *Tribolonotus blanchardi* Burt, 1930.

Diagnosis: *Quazitribolonotus gen. nov.* is the new genus name applied to the *T. blanchardi* Burt, 1930 complex. Until now this has been treated as a single species, but is herein divided three ways inside the newly named genus.

The genus *Tribolonotus* Duméril and Bibron, 1839 is readily separated from *Quazitribolonotus gen. nov.* and *Feretribolonotus gen. nov.* by the presence of enlarged dorsal scales in four rows and projecting spines present on the posterior dorsal margin of head.

The other two genera (*Quazitribolonotus gen. nov.* and *Feretribolonotus gen. nov.*) are characterised by having enlarged dorsal scales in one vertebral row or in two rows juxtaposed along the midline and the posterior margin of the head lacks projecting spines.

The genus *Quazitribolonotus gen. nov.* is readily separated from *Feretribolonotus gen. nov.* by having enlarged vertebral scales in a single row. *Feretribolonotus gen. nov.* have enlarged vertebral scales in a double row.

Head scalation of *Quazitribolonotus gen. nov.* identified as *T. blanchardi*, is described in detail by McCoy (2006) at page 86.

The subgenus *Propetribolonotus subgen. nov.* which includes the live-bearing species *F. schmidti* is separated from others in the genus by the following characters: Juxtaposed rows of enlarged dorsal scales commence on nape immediately posterior to the enlarged scales on head; two rows of enlarged vertebral scales in contact with parietal scales or separated by small granular and spiny scales; maximum recorded snout-vent, length 41 mm, versus, juxtaposed rows of enlarged dorsal scales commence on the posterior part of the nape, most of neck being covered with granular or spiny scales and/or spiny, enlarged scales in rows closest to enlarged vertebral rows numerous, approximately one scale for each enlarged middorsal scale; two primary temporal scales in all other *Feretribolonotus gen. nov.*.

All three genera are characterised as follows: They are small to medium sized lizards. The lower eyelid is scaly; no supranasals or prefrontals. The frontoparietals may be distinct or fused. The head shields are notably rugose with distinct longitudinal ridges and highly fused. The body scales are carinate or spinose. The limbs are well developed and pentadactyl.

Fojia Greer and Simon, 1982, from Madang, PNG, differs from *Tribolonotus* in having, in males, glandular patches on the chin and undersides of thighs and tail base as well as the abdomen, and in having a typical instead of a highly fused complement of head scales. Otherwise it is physically similar in most respects, although significantly different in habits as outlined by Greer and Simon (1982).

Distribution: Solomon Islands, specifically including Choiseul and Isabella (type species); Bougainville (*Q. frankanthonyi sp. nov.*); Ngela (*Q. tomlonsdalei sp. nov.*).

Etymology: A derivative of the word part "*quazi*" or "*quasi*" meaning "have some of the form of" in Latin. The latter part of the name **"***tribolonotus*" being that to which it is like.

Content: *Quazitribolonotus blanchardi* (Burt, 1930) (type species); *Q. frankanthonyi sp. nov.*; *Q. tomlonsdale sp. nov.*.

FERETRIBOLONOTUS GEN. NOV.

Type species: *Feretribolonotus greeri sp. nov.*

Diagnosis: *Feretribolonotus gen. nov.* is the new genus name applied to the Solomon Islands/Manus Island/New Britain clade, herein comprising a total of six species. Until now this has been treated as five species within the genus *Tribolonotus* Duméril and Bibron, 1839, with a new species named herein.

The genus *Tribolonotus* is readily separated from *Quazitribolonotus gen. nov.* and *Feretribolonotus gen. nov.* by the presence of enlarged dorsal scales in four rows and projecting spines present on the posterior dorsal margin of head.

The other two genera (*Quazitribolonotus gen. nov.* and *Feretribolonotus gen. nov.*) are characterised by having enlarged dorsal scales in one vertebral row or in two rows juxtaposed along the midline and the posterior margin of the head lacks projecting spines.

The genus *Quazitribolonotus gen. nov.* is readily separated from *Feretribolonotus gen. nov.* by having enlarged vertebral scales in a single row. *Feretribolonotus gen. nov.* have enlarged vertebral scales in a double row.

The subgenus *Propetribolonotus subgen. nov.* which includes the live-bearing species *F. schmidti* is separated from others in the genus by the following characters: Juxtaposed rows of enlarged dorsal scales commence on nape immediately posterior to the enlarged scales on head; two rows of enlarged vertebral scales in contact with parietal scales or separated by small granular and spiny scales; maximum recorded snout-vent, length 41 mm, versus, juxtaposed rows of enlarged dorsal scales commence on the posterior part of the nape, most of neck being covered with granular or spiny scales and/or spiny, enlarged scales in rows closest to enlarged vertebral rows numerous, approximately one scale for each enlarged middorsal scale; two primary temporal scales in all other *Feretribolonotus gen. nov.*.

All three genera are characterised as follows: They are small to medium sized lizards. The lower eyelid is scaly; no supranasals or prefrontals. The frontoparietals may be distinct or fused. The head shields are notably rugose with distinct longitudinal ridges and highly fused. The body scales are carinate or spinose. The limbs are well developed and pentadactyl.

Fojia Greer and Simon, 1982, from Madang, PNG, differs from *Tribolonotus* in having, in males, glandular patches on the chin and undersides of thighs and tail base as well as the abdomen, and in having a typical instead of a highly fused complement of head scales. Otherwise it is physically similar in most respects, although significantly different in habits as outlined by Greer and Simon (1982).

Distribution: Known from the Solomon Islands, including: Bougainville, Choiseul, Shortland, Buka, Guadalcanal, Marapna, Manus Island and New Britain.

Etymology: A derivative of the word part "*fere*" meaning "not quite" in Latin. The latter part of the name **"***tribolonotus*" being that to which it is like.

Content: *Feretribolonotus greeri sp. nov.* (type species); *F. annectens* (Zwiefel, 1966); *F. brongersmai* (Cogger, 1972); *F. ponceleti* (Kinghorn, 1937); *F. pseudoponceleti* (Greer and Parker, 1968); *F. schmidti* (Burt, 1930).

PROPETRIBOLONOTUS SUBGEN. NOV.

Type species: *Tribolonotus schmidti* Burt, 1930.

Diagnosis: The subgenus *Propetribolonotus subgen. nov.* which is monotypic for the live-bearing species *F. schmidti* is separated from others in the genus *Feretribolonotus gen. nov.* by the following characters: Juxtaposed rows of enlarged dorsal scales commence on nape immediately posterior to the enlarged scales on head; two rows of enlarged vertebral scales in contact with parietal scales or separated by small granular and spiny scales; maximum recorded snout-vent, length 41 mm, versus, juxtaposed rows of enlarged dorsal scales commence on the posterior part of the nape, most of neck being covered with granular or spiny scales and/or spiny, enlarged scales in rows closest to enlarged vertebral rows numerous, approximately one scale for each enlarged middorsal scale; two primary temporal scales in all other *Feretribolonotus gen. nov.*.

Feretribolonotus gen. nov. have enlarged vertebral scales in a double row.

The genus *Quazitribolonotus gen. nov.* is readily separated from *Feretribolonotus gen. nov.* by having enlarged vertebral scales in a single row.

Quazitribolonotus gen. nov. is the new genus name applied to the *T. blanchardi* Burt, 1930 complex. Until now this has been treated as a single species, but is herein divided three ways inside the newly named genus.

The genus *Tribolonotus* Duméril and Bibron, 1839 is readily separated from *Quazitribolonotus gen. nov.* and *Feretribolonotus gen. nov.* by the presence of enlarged dorsal scales in four rows and projecting spines present on the posterior dorsal margin of head.

The other two genera (*Quazitribolonotus gen. nov.* and *Feretribolonotus gen. nov.*) are characterised by having enlarged dorsal scales in one vertebral row or in two rows juxtaposed along the midline and the posterior margin of the head lacks projecting spines.

All three genera are characterised as follows: They are small to medium sized lizards. The lower eyelid is scaly; no supranasals or prefrontals. The frontoparietals may be distinct or fused. The head shields are notably rugose with distinct longitudinal ridges and highly fused. The body scales are carinate or spinose. The limbs are well developed and pentadactyl.

Fojia Greer and Simon, 1982, from Madang, PNG, differs from *Tribolonotus* in having, in males, glandular patches on the chin and undersides of thighs and tail base as well as the abdomen, and in having a typical instead of a highly fused complement of head scales.

Otherwise it is physically similar in most respects, although significantly different in habits as outlined by Greer and Simon (1982).

Distribution: Guadalcanal and immediately adjacent islets, Solomon Islands.

Etymology: A derivative of the word part "*prope*" meaning "close to" in Latin. The latter part of the name **"***tribolonotus*" being that to which it is like.

Content: *Propetribolonotus schmidti* Burt, 1930 (monotypic).

QUAZITRIBOLONOTUS FRANKANTHONYI SP. NOV.

Holotype: A preserved specimen at the California Academy of Sciences (CAS), USA, specimen number: 94011 collected at Kunua, Bougainville, Lat. -5.78, Long. 154.75 in the Solomon Islands.

The California Academy of Sciences is a facility that allows access to its holdings by scientists.

Paratype: A preserved specimen at the California Academy of Sciences (CAS), USA, specimen number: 94012 collected at Kunua, Bougainville Lat. -5.78, Long. 154.75 in the Solomon Islands.

Paratype: *Quazitribolonotus frankanthonyi sp. nov.* is similar in most respects to both *Q. blanchardi* (Burt, 1930) and *Q. tomlonsdalei sp. nov.* but is most readily differentiated on the basis of colouration, being generally dark brown dorsally on the upper surfaces, versus yellowish brown on the upper surfaces in the other two species.

Q. tomlonsdalei sp. nov. possesses a well-defined squarish white patch running from the lower labial up to almost the front of the eye. This is ill-defined or absent in the other two species (*Q. blanchardi* and *Q. frankanthonyi sp. nov.*).

While colouration of specimens is variable in species until now treated as *Q. blanchardi* as described by McCoy (2006), there is a general trend towards a considerable dulling in adults, as compared to juveniles.

The genus *Quazitribolonotus gen. nov.* is readily separated from *Feretribolonotus gen. nov.* by having enlarged vertebral scales in a single row. *Feretribolonotus gen. nov.* have enlarged vertebral scales in a double row.

The genus *Tribolonotus* Duméril and Bibron, 1839 is readily separated from *Quazitribolonotus gen. nov.* and *Feretribolonotus gen. nov.* by the presence of enlarged dorsal scales in four rows and projecting spines present on the posterior dorsal margin of head.

The other two genera (*Quazitribolonotus gen. nov.* and *Feretribolonotus gen. nov.*) are characterised by having enlarged dorsal scales in one vertebral row or in two rows juxtaposed along the midline and the posterior margin of the head lacks projecting spines.

The subgenus within *Feretribolonotus gen. nov.*, namely *Propetribolonotus subgen. nov.* which includes the live-bearing species *F. schmidti* is separated from others in the genus by the following characters: Juxtaposed rows of enlarged dorsal scales commence on nape immediately posterior to the enlarged scales on head; two rows of enlarged vertebral scales in contact with parietal scales or separated by small granular and spiny scales; maximum recorded snout-vent, length 41 mm, versus, juxtaposed rows of enlarged dorsal scales commence on the posterior part of the nape, most of neck being covered with granular or spiny scales and/or spiny, enlarged scales in rows closest to enlarged vertebral rows numerous, approximately one scale for each enlarged middorsal scale; two primary temporal scales in all other *Feretribolonotus gen. nov.*.

All three genera are characterised as follows: They are small to medium sized lizards. The lower eyelid is scaly; no supranasals or prefrontals. The frontoparietals may be distinct or fused. The head shields are notably rugose with distinct longitudinal ridges and highly fused. The body scales are carinate or spinose. The limbs are well developed and pentadactyl.

Fojia Greer and Simon, 1982, from Madang, PNG, differs from *Tribolonotus* in having, in males, glandular patches on the chin and undersides of thighs and tail base as well as the abdomen, and in having a typical instead of a highly fused complement of head scales. Otherwise it is physically similar in most respects, although significantly different in habits as outlined by Greer and Simon (1982).

Distribution: Known only from the island of Bougainville in the Solomon Islands.

Etymology: Named after Frank Anthony, of Quick Copy, Box Hill, Victoria, Australia, for services to herpetology and wildlife conservation in general, including through his valuable role in publishing *Australasian Journal of Herpetology.*

QUAZITRIBOLONOTUS TOMLONSDALEI SP. NOV.

Holotype: A preserved specimen at the Australian Museum in Sydney, Australia, specimen number: R.81773 collected at Boromole Village, Ngela Sule (Big Gela), Florida Gap, Solomon Islands.

The Australian Museum in Sydney, Australia is a government owned facility that allows access to its specimen holdings.

Paratype: A preserved specimen at the Australian Museum in Sydney, Australia, specimen number: R.91221 collected at Boromole Village, Ngela Sule (Big Gela), Florida Gap, Solomon Islands.

Diagnosis: *Quazitribolonotus tomlonsdalei sp. nov.* is most similar to *Q. blanchardi* (Burt, 1930).

Q. tomlonsdalei sp. nov. possesses a well-defined squarish white patch running from the lower labial up to almost the front of the eye. This is ill-defined or absent in the other two species (*Q. blanchardi* and *Q. frankanthonyi sp. nov.*).

Q. frankanthonyi sp. nov. is similar in most respects to both *Q. blanchardi* (Burt, 1930) and *Q. tomlonsdalei sp. nov.* but is most readily differentiated on the basis of colouration, being generally dark brown dorsally on the upper surfaces, versus yellowish brown on the upper surfaces in the other two species.

While colouration of specimens is variable in species until now treated as *Q. blanchardi* as described by McCoy (2006), there is a general trend towards a considerable dulling in adults, as compared to juveniles.

Head scalation of *Quazitribolonotus gen. nov.* described by him as *T. blanchardi*, is described in detail by McCoy (2006).

The genus *Quazitribolonotus gen. nov.* is readily separated from *Feretribolonotus gen. nov.* by having enlarged vertebral scales in a single row. *Feretribolonotus gen. nov.* have enlarged vertebral scales in a double row.

The genus *Tribolonotus* Duméril and Bibron, 1839 is readily separated from *Quazitribolonotus gen. nov.* and *Feretribolonotus gen. nov.* by the presence of enlarged dorsal scales in four rows and projecting spines present on the posterior dorsal margin of head.

The other two genera (*Quazitribolonotus gen. nov.* and *Feretribolonotus gen. nov.*) are characterised by having enlarged dorsal scales in one vertebral row or in two rows juxtaposed along the midline and the posterior margin of the head lacks projecting spines.

The subgenus within *Feretribolonotus gen. nov.*, namely *Propetribolonotus subgen. nov.* which includes the live-bearing species *F. schmidti* is separated from others in the genus by the following characters: Juxtaposed rows of enlarged dorsal scales commence on nape immediately posterior to the enlarged scales on head; two rows of enlarged vertebral scales in contact with parietal scales or separated by small granular and spiny scales; maximum recorded snout-vent, length 41 mm, versus, juxtaposed rows of enlarged dorsal scales commence on the posterior part of the nape, most of neck being covered with granular or spiny scales and/or spiny, enlarged scales in rows closest to enlarged vertebral rows numerous, approximately one scale for each enlarged middorsal scale; two primary temporal scales in all other *Feretribolonotus gen. nov.*.

All three genera are characterised as follows: They are small to medium sized lizards. The lower eyelid is scaly; no supranasals or prefrontals. The frontoparietals may be distinct or fused. The head shields are notably rugose with distinct longitudinal ridges and highly fused. The body scales are carinate or spinose. The limbs are well developed and pentadactyl.

Fojia Greer and Simon, 1982, from Madang, PNG, differs from *Tribolonotus* in having, in males, glandular patches on the chin and undersides of thighs and tail base as well as the abdomen, and in having a typical instead of a highly fused complement of head scales. Otherwise it is physically similar in most respects, although significantly different in habits as outlined by Greer and Simon (1982).

Distribution: Known only from Ngela Sule (Big Gela), Florida Gap, Solomon Islands.

Etymology: Named in honour of Tom Lonsdale, a veterinary surgeon from Bligh Park, New South Wales, Australia in recognition for his public exposure of bogus animal welfare charities.

FERETRIBOLONOTUS GREERI SP. NOV.

Holotype: A preserved specimen in the American Museum of Natural History (AMNH) specimen number: 89434, from Buka Island in the Autonomous Region of Bougainville, in eastern Papua New Guinea. The American Museum of Natural History is a facility that allows access to its holdings.

Paratypes: Preserved specimens in the Museum of Camparative Zoology (MCZ) Harvard University, USA, specimen numbers: 67706-67716 and 73850-73861 from Buka Island in the Autonomous Region of Bougainville, in eastern Papua New Guinea.

Diagnosis: *Feretribolonotus greeri sp. nov.* is similar in most respects to *Feretribolonotus pseudoponceleti* Greer and Parker (1968) that being the species specimens have been referred to until now.

There is a noticeable difference in the dorsal color of the Bougainville species (*F. pseudoponceleti*) and Buka specimens (*F. greeri sp. nov.*).

F. pseudoponceleti from Bougainville are dark brown dorsally with a slight amount of mottling, versus a light dorsal color tending towards a creamy tan or light brown colour with a significant amount of brown mottling in *F. greeri sp. nov.*.

The general differences in color pattern between the Buka Island species and Bougainville species are correlated with differences in the distribution of certain scale counts between the two populations as outlined by Greer and Simon (1982) in their “Table 1”.

Distribution: Known only from from the southern part of Buka Island in the Autonomous Region of Bougainville, in eastern Papua New Guinea.

Etymology: Named in honour of Allen E. Greer, formerly of the Australian Museum in Sydney in recognition of his significant contribution to herpetology, including with reference to the newly named species, as well as his contributions to social debate, via the tavloid media in the years since his formal retirement.

TRIBOLONOTUS GRACILIS KARKARENSIS SUBSP. NOV.

Holotype: A preserved specimen at the Australian Museum in Sydney, specimen number: R.66804 collected at Kar Kar Island, Madang District, Papua New Guinea.

The Australian Museum in Sydney, Australia is a government owned facility that allows access to its specimen holdings.

Paratypes: Preserved specimens at the Australian Museum in Sydney, specimen numbers R.24859 and R.24860 collected at Kar Kar Island, Madang District, Papua New Guinea.

Diagnosis: Similar in most respects to the nominate form of *T. gracilis* de Rooij, 1909, but is most easily differentiated by the configuration of the eye markings in adults.
In nominate *T. gracilis* the characteristic orange encircles the eye, except for the top part of the ocular. By contrast in *T. gracilis karkarensis subsp. nov.* the orange is only present anterior and posterior to the eye, where there are large blotches and there is a large gap below the eye, where the scales remain the normal greyish-brown colour.

In *T. gracilis karkarensis subsp. nov.* there is a distinct flattened ridge that runs from the front of the top of the eye, backwards across the skull. This same ridge commences further back, as in from the rear half of the top of the eye in nominate *T. gracilis.*

Distribution: Known only from Kar Kar Island and the immediately adjacent mainland around the Huon Peninsula, Madang, PNG.

Etymology: Named in reflection of where the taxon is found in large numbers (Kar Kar Island).

TRIBOLONOTIINI *TRIBE NOV.*

(Terminal taxon: *Zonurus novaeguineae* Schlegel, 1834)

Diagnosis: The ventral glands of adult males and the juxtaposition of the normal sized middorsal scales with the granular lateral scales will instantly distinguish Trobolonotiini *tribe nov.* all other skinks. *Fojia* (subtribe Fojiina *subtribe nov.*), differs from the nominate subtribe Tribolonotiina *subtribe nov.* in having, in males, glandular patches on the chin and undersides of thighs and tail base as well as the abdomen, and in having a typical instead of a highly fused complement of head scales.

Distribution: The island arc north of New Guinea including those landmasses that have accreted to the New Guinea mainland in the recent geological past in places such as the Huon Peninsula and northern New Guinea, including the Bismark Archipelago and the Solomon Islands.

Content: *Tribolonotus* Duméril and Bibron, 1839 (type genus); *Feretribolonotus gen. nov.*; *Fojia* Greer and Simon, 1982; *Quazitribolonotus gen. nov.*.

FOJIINA *SUBTRIBE NOV.*

(Terminal taxon: *Fojia bumui* Greer and Simon, 1982)

Diagnosis: The ventral glands of adult males and the juxtaposition of the normal sized middorsal scales with the granular lateral scales will instantly distinguish Trobolonotiini *tribe nov.* all other skinks. *Fojia* (subtribe Fojiina *subtribe nov.*), differs from the nominate subtribe Tribolonotiina *subtribe nov.* in having in males, glandular patches on the chin and undersides of thighs and tail base as well as the abdomen, and in having a typical instead of a highly fused complement of head scales.

Distribution: Known only from the vicinity of the type locality in the Moikisung area at an Elevation of 550 metres, on the Huon Peninsula, Morobe Province, Papua New Guinea, (147°30’E, 6°34’S).

Content: *Fojia* Greer and Simon, 1982 (monotypic).

TRIBOLONOTIINA *SUBTRIBE NOV.*

(Terminal taxon: *Zonurus novaeguineae* Schlegel, 1834)

Diagnosis: The ventral glands of adult males and the juxtaposition of the normal sized middorsal scales with the granular lateral scales will instantly distinguish Trobolonotiini *tribe nov.* all other skinks. *Fojia* (subtribe Fojiina *subtribe nov.*), differs from the nominate subtribe Tribolonotiina *subtribe nov.* in having, in males, glandular patches on the chin and undersides of thighs and tail base as well as the abdomen, and in having a typical instead of a highly fused complement of head scales.

Distribution: The island arc north of New Guinea including those landmasses that have accreted to the New Guinea mainland in the recent geological past in places such as the Huon Peninsula and northern New Guinea, including the Bismark Archipelago and the Solomon Islands.

Content: *Tribolonotus* Duméril and Bibron, 1839 (type genus); *Feretribolonotus gen. nov.*; *Quazitribolonotus gen. nov.*.

REFERENCES CITED

Adler, G. H., Austin, C. C. and Dudley, R. 1995. Dispersal and speciation of skinks among archipelagos in the tropical Pacific Ocean. *Evolutionary Ecology* 9:529-541.

Austin, C. C., Rittmeyer, E. N., Richards, S. J. and Zug, G. R. 2010. Phylogeny, historical biogeography and body size evolution in Pacific Island Crocodile skinks *Tribolonotus* (Squamata; Scincidae). *Mol. Phyl. and Evol.* 57(1):227-236.

Balsai, M. J. 1995. Husbandry and Breeding of the Solomon Islands Prehensile-tailed Skink, *Corucia zebrata*. *The Vivarium* 7(1):4-11.

Bonetti, M. 2002. *100 Sauri.* Mondadori (Milano):192 pp.

Bruns, T. R., Vedder, J. R. and Cooper, A. K. 1989. Geology of the Shortland Basin Region, Central Solomons Trough, Solomon Islands - Review and New Findings. pp. 125-144 in Vedder, J.G., and Bruns, T. R., (editors), 1989. Geology and offshore resources of Pacific island arcs Solomon Islands and Bougainville, Papua New Guinea Regions: Houston, Texas, Circum-Pacific Council for Energy and Mineral Resources, Earth Science Series, v. 12.

Boulenger, G. A. 1887. *Catalogue of the Lizards in the British Museum (Nat. Hist.) III. Lacertidae, Gerrhosauridae, Scincidae, Anelytropsidae, Dibamidae, Chamaeleontidae.* London:575pp.

Boseto, D. and Pikacha, P. (eds.) 2016. A report on baseline biodiversity inventory of Mount Maetambe to Kolobangara River Corridor, Choiseul Island, Solomon Islands. Downloaded from the website of Ecological Solutions Solomon Islands at: http://ecologicalsolutions-si.com/files/110494600.pdf

Burt, C. E. 1930. Herpetological results of the Whitney South Sea Expedition IV. Descriptions of new species of lizards from the Pacific Islands (Scincidæ). *American Museum Novitates* (427):1-3.

Burt, C. E. and Burt, M. D. 1932. Herpetological results of the Whitney South Sea Expedition. VI. Pacific island amphibians and reptiles in the collection of the American Museum of Natural History. *Bull. Amer. Mus. Nat. Hist.* 63(5):461-597.

Charlier, P. 1999. Haltung und Nachzucht des Neuguinea “Buschkrokodils” *Tribolonotus gracilis. Elaphe* 7(3):23-24.

Cogger, H. G. 1972. A new scincid lizard of the genus *Tribolonotus* from Manus Island, New Guinea. *Zool. Mededelingen* 47:202-210.

Court of Appeal Victoria. 2014. Hoser v Department of Sustainability and Environment [2014] VSCA 206 (5 Sept.).

de Rooij, N. de 1909. Reptilien (Eidechsen, Schildkröten und Krokodile). *Nova Guinea* 5:375-383.

de Rooij, N. de 1915. *The Reptiles of the Indo-Australian Archipelago. I. Lacertilia, Chelonia, Emydosauria.* Leiden (E. J. Brill):xiv+384 pp.

de Rooij, N. de 1919. Reptiles (Lacertilia, Chelonia, Emydosauria). *Nova Guinea* 13:133-153 [1915-1919].

Dost, U. 2001. Das Rotaugen-Buschkrokodil, *Tribolonotus gracilis. VDA-Aktuell* 2/2001:51-56.

Duméril, A. M. C. and Bibron, G. 1839. *Erpétologie Générale on Histoire Naturelle Complète des Reptiles. Vol.5*. Roret/Fain et Thunot, Paris, 871 pp.

Evers, M. 2006. Das Buschkrokodil. *Reptilia* (Münster) 11(58):55-60.

Evers, M. 2010. Der Orangeaugen-Helmskink *Tribolonotus gracilis. Natur und Tier* Verlag:64 pp.

Greer, A. E. 1982. A new species of *Geomyersia* (Scincidae) from the Admirality Islands, with a summary of the genus. *Journal of Herpetology* 16(1):61-66.

Greer, A. E. and Parker, F. 1967. A new scincid lizard from the northern Solomon Islands. *Breviora* (275):1-20.

Greer, A. E. and Simon, M. 1982. *Fojia bumui*, an unusual new genus and species of scincid lizard from New Guinea. *Journal of Herpetology* 16(2):131-139.

Hagen, I. J., Donnellan, S. C. and Bull, M. 2012. Phylogeography of the prehensile-tailed skink *Corucia zebrata* on the Solomon Archipelago. *Ecology and Evolution* (2012), 2(6):1220–1234.

Hall, R., 2002. Cenozoic geological and plate tectonic evolution of SE Asia and the SW Pacific: computer-based reconstructions, model and animations. *J. Asian Earth Sci.* 20:353-431.

Iskandar, D. T. and Erdelen, W. R. 2006. Conservation of amphibians and reptiles in Indonesia: issues and problems. *Amphibian and Reptile Conservation* 4(1):60-87.

Keogh, S. J., Scott, A. W., Fitzgerald, M. and Shine, R. 2003. Molecular phylogeny of the Australian venomous snake genus *Hoplocephalus* (Serpentes, Elapidae) and conservation genetics of the threatened *H. stephensii*. *Conservation Genetics* 4:57-65.

Kinghorn, J. R. 1937. A new species of skink from the Solomon Islands. *Records of the Australian Museum* 20(1):1-2.

McCoy, M. 1980. *Reptiles of the Solomon Islands*. Wau Ecology Institute Handbook 7. Wau Ecology Inst., Wau, PNG.

McCoy, M. 2006. *Reptiles of the Solomon Islands*. Pensoft Series Faunistica 57:212 pp.

McDowell, S. B. 1970. On the status and relationships of the Solomon Island elapid snakes. *Journal of Zoology*, London 161:145-190.

Meyer, J. 2002. Einige Bemerkungen zur Haltung und Nachzucht von Helmskinken der Art *Tribolonotus gracilis* (DE ROOIJ 1909). *Herpetofauna* 24(139):28-34.

Meyer, J. 2012. Erste Erfahrungen mit dem Neuguinea-Helmskink, *Tribolonotus novaeguineae. Terraria Elaphe* 2012(6):78-86.

Miralles, A. 2004. Biologie, ecologie en verzorging van de Krokodilskink van Nieuw-Guinea, *Tribolonotus gracilis. Lacerta* 62(4):166-173.

Mys, B. 1988. The zoogeography of the scincid lizards from North Papua New Guinea (Reptilia: Scincidae). I. The distribution of the species. *Bull. Inst. Roy. Sci. Nat. Belgique* (Biologie) 58:127-183.

Parker, H. W. 1940. Undescribed anatomical structures and new species of reptiles and amphibians. *Ann. Mag. nat. Hist.* (11)5:257-274.

Peters, U. 1970. *Tribolonotus gracilis* im Terrarium. *DATZ* 23(1):29-30.

Pianka, E. R. and Vitt, L. J. 2003. *Lizards - Windows to the Evolution of Diversity.* University of California Press, Berkeley:347 pp.

Pyron, R. A., Burbrink, F. T. and Wiens, J. J. 2013. A phylogeny and revised classification of Squamata, including 4161 species of lizards and snakes. *BMC Evolutionary Biology* 13:93.

Reeder, T. W. 2003. A phylogeny of the Australian *Sphenomorphus* group (Scincidae: Squamata) and the phylogenetic placement of the crocodile skinks (*Tribolonotus*): Bayesian approaches to assessing congruence and obtaining confidence in maximum likelihood inferred relationships. *Molecular Phylogenetics and Evolution* 27:384-397.

Ride, W. D. L. (*ed.*) *et al.* (on behalf of the International Commission on Zoological Nomenclature) 1999. *International code of Zoological Nomenclature* (Fourth edition). The Natural History Museum - Cromwell Road, London SW7 5BD, UK.

Rittmeyer. E. N. and Austin, C. C. 2015. Combined next-generation sequencing and morphology reveal fine-scale speciation in Crocodile Skinks (Squamata: Scincidae: *Tribolonotus*). *Mol Ecol.* 2015 Jan, 24(2):466-83. doi: 10.1111/mec.13030. Epub 2015 Jan 9.

Roux, J. 1930. Note sur un reptile scincidé des îles Salomon présentant des pres pédiaux. *Verhandl. Naturf. Ges. Basel* 41:129-135.

Russell, E. and Coupe, S. 1984. *The Macquarie World Illustrated Atlas.* Kevin Weldon, Macquarie Library, Chatswood, NSW, Australia:511 pp.

Schlegel, H. 1834. Monographie van het geslacht *Zonurus. Tijdschr. Nat. Gesch. Phys.* 1:203-221.

Victorian Civil and Administrative Tribunal (VCAT). 2015. *Hoser v Department of Environment Land Water and Planning* (Review and Regulation) [2015] VCAT 1147 (30 July 2015, judgement and transcript).

Zweifel, R. G. 1966. A New Lizard of the Genus *Tribolonotus* (Scincidae) from New Britain. *Am. Mus. Novitates* 2264:1-12.

CONFLICT OF INTEREST

The author has no known relevant conflicts of interest.

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These dragons are not all the same! A break up of the Australian agamid species *Adelynhosersaur spinipes* (Duméril and Bibron, 1851) into three subspecies.

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ABSTRACT

Fieldwork in wetter forests in hillier parts of coastal New South Wales and Queensland (Australia) spanning some two decades yielded morphologically distinct variants of the putative species *Adelynhosersaur spinipes* (Duméril and Bibron, 1851).

Museum records from the Australian Museum in Sydney and the Queensland Museum in Brisbane show these populations to be allopatric and separated by significant dry zone gaps, which these lizards would have extreme difficulty in bridging.

As each population are clearly evolving independently, they are herein formally named as subspecies according to the *International Code of Zoological Nomenclature* (Ride *et al.* 1999).

Only the nominate form has an available name.

The three new subspecies being named herein are *Adelynhosersaur spinipes adelynae subsp. nov.*, *A. spinipes jackyae subsp. nov.* and *A. spinipes wilkiei subsp. nov.* respectively.

Keywords: Taxonomy; Nomenclature; Lizards; Dragon; Queensland; New South Wales; Australia; rainforest; *Adelynhosersaur*, *Hypsilurus*; genus; species; *spinipes*; new subpecies; *adelynae*; *jackyae*; *wilkiei.*

INTRODUCTION

The putative Australian agamid species *Adelynhosersaur spinipes* (Duméril and Bibron, 1851), was formerly known as *Hypsilurus spinipes* (Duméril and Bibron, 1851), before being transferred to the newly named genus *Adelynhosersaur* by Hoser (2013), for reasons given in that paper.

The putative species is a rainforest obligate, confined to patches of wet forests in a zone from about Gosford on the New South Wales central coast to the ranges north-west of the Sunshine Coast, south-east Queensland.

Within this range, there are significant breaks in known populations. Notwithstanding the potential for specimens to be found in these areas, this is thought unlikely on the basis that the areas have already been heavily collected by herpetologists and museums in Australia and none have been found.

Furthermore these zones where the putative species are not known from are of generally unsuitable habitat for these lizards, being either flat, dry (as in dry forests, rather than rainforests), both, or otherwise unsuitable for these lizards.

This unsuitable habitat is also defined on the thermal properties within, as the putative species *A. spinipes* appears to prefer thermally inert rainforest habitats and its lifestyle does not include a significant amount of thermoregulation by shuttling as shown by Rummery *et al.* (1995).

Hence it appears that the extant populations are in fact well isolated from one another.

Based on the assumption that rainforests, being suiable areas of potential habitat have expanded in the post ice-age period of the last 12,000 years, it is reasonable to assume that these breaks in populations have been long standing.

Fieldwork by myself and co-workers in wetter forests in hillier parts of coastal New South Wales and Queensland (Australia) spanning some two decades yielded morphologically distinct variants of the putative species *Adelynhosersaur spinipes* (Duméril and Bibron, 1851), which automatically led me to believe that more than one taxon was being labelled as "*Hypsilurus spinipes*".

Considerable data was obtained and compiled, but was unfortunately stolen in an illegal armed raid on our facility on 17 August 2011. However I have been able to access significant numbers of specimens, images and the like since that date, to enable this paper to be published, albeit without the bulk of the data I would like to have presented.

Museum records from the Australian Museum in Sydney and the Queensland Museum in Brisbane, Australia show the relevant populations to be allopatric and separated by significant dry zone gaps.

There are five main population centres, these being essentially as follows:

1/ The Central Coast of New South Wales, north of the Hawkesbury basin, that is sited north of Sydney and extending to the wetter hills in the region south of the Hunter Valley dry zone, south-west of Newcastle.

2/ The lower north coast of New South Wales, north and west of Myall Lakes, extending north to the hills inland and between Port Macquarie and Kempsey.

3/ The region around and inland from Nambucca Heads and Coffs Harbour on the mid north coast of New South Wales.

4/ The Border Ranges region of New South Wales and far southern Queensland, including wetter ranges immediately south of there, inland from Ballina and bounded by the Brisbane River Valley dry zone in the north.

5/ An area north and north-west of the Brisbane River, primarily including the wetter parts of the Sunshine Coast hinterland in south-east Queensland, north of the main part of the capital city of Brisbane.

As stated already, Rummery *et al.* (1995) noted an unusual inability of this putative species to be able to disperse outside of their preferred thermally inert habitat. This is further evidence in support of the long term isolation of each population.

As each population are clearly evolving independently, they are herein formally treated as subspecies according to the *International Code of Zoological Nomenclature* (Ride *et al.* 1999).

This is the most conservative level of taxonomic recognition allowed by the *International Code of Zoological Nomenclature.*

Two of these populations are noteworthy for the following reasons.

That from the lower north coast of New South Wales, north and west of Myall Lakes, extending north to the hills inland and between Port Macquarie and Kempsey and that from the region around and inland from Nambucca Heads and Coffs Harbour on the mid north coast of New South Wales, appear morphologically similar and so are believed to have been separated very recently. I treat them as being of the same subspecies herein. They also are most typical of the holotype specimen MNHN Paris (= MNHP) 2560 as described by Duméril and Bibron (1851).

This is noted as the original description provided a type locality of “Australia” but without exact location data.

Only this nominate form has an available name.

The three new subspecies being named herein, as in the other unnamed forms, are *Adelynhosersaur spinipes adelynae subsp. nov.* from the central coast of New South Wales, *A. spinipes jackyae subsp. nov.* from the Border Ranges region of NSW and Queensland and *A. spinipes wilkiei* from the Sunshine Coast hinterland, Queensland, respectively.

These and the nominate form are all readily separated from one another on the basis of adult colouration in both sexes as defined in the descriptions below.

I also note that it is likely that further study may result in these named subspecies being elevated to full species.

While the taxonomic judgements made herein are based on a direct inspection of specimens from each of the relevant populations, it is prudent for me to refer to some of the literature relevant to the species complex herein.

Key references include Boulenger (1885), Cogger (2014), Cogger *et al.* (1983), Denzer and Manthey (2016), Duméril and Bibron (1851), Fry (1915), Hoser (1989, 2013, 2014), Longley (1943), Manthey and Denzer (2006), Pianka and Vitt (2003), Rummery *et al.* (1995), Wells and Wellington (1983, 1985), Wilson (2015), Wilson and Swan (2003) and sources cited therein.

In terms of the theft of relevant materials from this author in an illegal armed raid on 17 August 2011 as already mentioned, I note that these were not returned (Court of Appeal Victoria 2014 and VCAT 2015) and this non-return of materials was in breach of various earlier court orders.

I have however made a decision to publish this paper.

This is in view of the conservation significance attached to the formal recognition of unnamed species or subspecies, being taxonomic units worthy of conservation and management by relevant authorities, be they government or non-government (NGO).

I note also that further delays may in fact put these otherwise unnamed taxa at greater risk of extinction should their status in the wild unexpectedly change, which is entirely possible in the face of the exponential human population growth in the relevant regions.

The situation is being exacerbated by the Australian government’s “Big Australia” population policy (Hoser 1991) which at the present time in 2016, leads to the realistic expectation of a ten-fold increase in number of humans in Australia (or more) in the period 2016 to 2216.

While it could be argued that the differences between specimens in the isolated populations are not worthy of taxonomic recognition, this view is contradicted by those expressed and actioned by Harvey *et al.* (2000). Also see the relevant paper of Moritz *et al.* (1993) in terms the issues of cryptic diversity of putative rainforest species in Australia, based on the home range fidelity of specimens.

ADELYNHOSERSAUR SPINIPES (DUMÉRIL AND BIBRON, 1851)

Holotype: Specimen MNHN Paris (= MNHP) 2560, type locality, “Australia”.

Diagnosis: *Adelynhosersaur gen. nov.* is monotypic for the type species *Adelynhosersaur spinipes* (Duméril and Bibron, 1851) and so the diagnosis below is for both. The species (and genus) is readily separated from other Australian *Tiaris* Duméril and Bibron, 1837 (the only genus it is likely to be confused with) and *Hypsilurus* from regions north of Australia, by the absence of a longitudinal row of grossly enlarged scales on the throat. In the other two genera, such scales are similar to those of the nuchal crest. The genus *Adelynhosersaur gen. nov.* is also separated from all other Amphibolurinae by the following suite of characters: grey, grey-brown or chocolate brown above, often suffused with green.

Immaculate or with dark brown flecks, spots of variegations and occasionally with obscure dark transverse bands across the top of the back and tail. Whitish or dirty brown below. Usually a broad, dark brown bar from the eye to the ear and some darker bars on the jaws. The body scales are heterogeneous, the scales on the dorsum and flanks are small and keeled and with scattered, enlarged, strongly keeled or spinose scales, often aligned to form irregular transverse rows. A series of enlarged spinose scales on the upper surfaces of the limbs. There is a fairly strong nuchal crest continuous with a low but conspicuous dorsal crest. Gulars are keeled with a few scattered, larger, keeled scales, especially on the midline. Remaining ventral and caudal scales are strongly keeled. The head is large and wedgeshaped, with a thick, angular canthus rostralis which continues as an acute supraocular ridge. The tympanum is large and superficial. The nostril is subcircular, facing outwards and slightly backwards and downwards in an enlarged and somewhat swollen nasal scale lying below the canthal ridge. The adpressed hindlimb reaches to between the eye and the tip of the snout, the hindlimb being about 90 per cent of the snout-vent length and the tail being about 200 per cent of the snout-vent length, (adapted from Cogger, 2000).

The separation of each of the relevant subspecies is as follows:

The nominate form of *A. spinipes spinipes* (Duméril and Bibron, 1851) herein confined to the mid north coast of New South

Wales is readily separated from the other species by the presence of five (or rarely four) distinct whitish bars on the lower labials, separated by darker brownish-black bars both extending 3-5 scales down, whereupon the colours abruptly merge to form a mottled but one colour appearance on the gular scales. There is also a well-defined, but slightly irregular dark temporal streak running from the back of the eye towards the ear, where it breaks up.

There are dark patches of scales, bounded by whitish scales, radiating from the upper eye.

Both fore and hind limbs have indistinct white crossbands.

The upper body surface has an obvious pattern.

The subspecies *A. spinipes adelynae subsp. nov.* from the New South Wales region bounded by the Hawkesbury River in the South and the Hunter Valley in the north, is readily separated from the other species by the absence of a well defined body pattern, instead being a reddish-brown all over with numerous irregular yellow spots. There are no white crossbands of any form on the limbs and there is no dark temporal streak running from the back of the eye towards the ear. Instead there is a narrow reddish flush at the same place. There is also a complete absence of five (or rarely four) distinct whitish bars on the lower labials, separated by darker brownish-black bars both extending 3-5 scales down. Instead the upper and lower labials are a near immaculate yellowish brown or grey colour. The limbs lack any form of lightish crossbands, instead having irregular yellow or red spots on them, these sometimes being vaguely arranged in a very broken and irregular cross-limb configuration.

The upper body surface lacks an obvious pattern.

There are no dark patches of scales, bounded by whitish scales, radiating from the upper eye.

The subspecies *A. spinipes jackyae subsp. nov.* from the border ranges region of New South Wales and Queensland is like nominate *A. spinipes spinipes* in most respects, but can be readily separated from that subspecies by the following differences to that taxon, the dark patches of scales radiating from above the eye are either absent or indistinct and are not obviously bounded by whitish scales or not at all.

Furthermore the slightly irregular dark temporal streak running from the back of the eye towards the ear is small and broken, or alternatively small and narrow if unbroken, versus larger and unbroken in *A. spinipes spinipes.*

In terms of the presence of five (or rarely four) distinct whitish bars on the lower labials, separated by darker brownish-black bars both extending 3-5 scales down, the last of these extends across the equivalent upper labial to form an obvious stripe running into the eye. Where a similar configuration is rarely seen in some *A. spinipes spinipes*, the whitish marking on the upper labials is in the form of a faded spot, smudge or flush, rather than as a distinct line.

In *A. spinipes jackyae subsp. nov.* the ligher markings on the forelimbs form a pattern of irregular spotting as opposed to obvious crossbands.

The subspecies *A. spinipes wikiei subsp. nov.* from the general region encompassing the Sunshine Coast hinterland in south-east Queensland is superficially intermediate in form and appearance to the other species. However it can be readily separated from them all by the following suite of characters. Dark patches radiating from the upper eye are either absent, or if present, not bounded by white. The presence of five (or rarely four) distinct whitish bars on the lower labials is only in the form of a very faded pattern, versus distinct in each of *A. spinipes spinipes* and *A. spinipes jackyae subsp. nov.*.
The dorsal pattern of *A. spinipes wikiei subsp. nov.* is either faded or indistinct, versus distinct in both *A. spinipes spinipes* and *A. spinipes jackyae subsp. nov.*.

A. spinipes wikiei subsp. nov. lack any obvious white, whitish, yellow or red markings, spotting or crossbands on the forelimbs. The body may have white or greyish-white flecks or irregular crossbands, but not the obvious red or yellow spots as seen in *A. spinipes adelynae subsp. nov.*.

There are numerous quality photos of all four subspecies in numerous texts and also online, clearly showing the diagnostic features identified above.

A photograph of typical specimens of this taxon *A. spinipes spinipes* are depicted on page 743 of Cogger (2014), showing the well-defined white bars on the lower labials, a well-defined dorsal colour pattern and whitish flush or blob on the rear upper labials (photo of adult).

Distribution: *A. spinipes spinipes* is found in a region generally north of the Hunter Valley in New South Wales stretching north along the coast and immediately adjacent ranges to about Coffs Harbour on the mid north coast of New South Wales.

A. spinipes adelynae subsp. nov. is found in the New South Wales region generally bounded by the Hawkesbury River to the south and the lower Hunter Valley in the north.

A. spinipes jackyae subsp. nov. is generally found in the border ranges region of New South Wales and Queensland and immediately adjacent ranges, bound by the Brisbane River in the North.

A. spinipes wikiei subsp. nov. occurs in the general region encompassing the Sunshine Coast hinterland in south-east Queensland, bounded by the dry zone to to the north of the Conondale Range and the Brisbane River in the South.

ADELYNHOSERSAUR SPINIPES ADELYNAE SUBSP. NOV.

Holotype: A preserved specimen at the Australian Museum in Sydney, NSW, Australia, specimen number R.106775 collected at Ourimbah in New South Wales, with quoted Latitude 33.33, Longitude 151.35.

The Australian Museum in Sydney, NSW, Australia is a goverment owned facility that allows access to its holdings.

Paratype: A preserved specimen at the Australian Museum in Sydney, NSW, Australia, specimen number R.5644 collected at Ourimbah in New South Wales, with quoted Latitude 33.37, Longitude 151.37.

Diagnosis: The separation of *A. spinipes adelynae* and the other relevant subspecies is as follows:

The nominate form of *A. spinipes spinipes* (Duméril and Bibron, 1851) herein confined to the mid north coast of New South Wales is readily separated from the other species by the presence of five (or rarely four) distinct whitish bars on the lower labials, separated by darker brownish-black bars both extending 3-5 scales down, whereupon the colours abruptly merge to form a mottled appearance on the gular scales. There is also a well-defined, but slightly irregular dark temporal streak running from the back of the eye towards the ear, where it breaks up.

There are dark patches of scales, bounded by whitish scales, radiating from the upper eye.

Both fore and hind limbs have indistinct white crossbands.

The upper body surface has an obvious pattern.

The subspecies *A. spinipes adelynae subsp. nov.* from the New South Wales region bounded by the Hawkesbury River in the South and the Hunter Valley in the north, is readily separated from the other species by the absence of a well defined body pattern, instead being a reddish-brown all over with numerous irregular yellow spots. There are no white crossbands of any form on the limbs and there is no dark temporal streak running from the back of the eye towards the ear. Instead there is a narrow reddish flush at the same place. There is also a complete absence of five (or rarely four) distinct whitish bars on the lower labials, separated by darker brownish-black bars both extending 3-5 scales down. Instead the upper and lower labials are a near immaculate yellowish brown or grey colour. The limbs lack any form of lightish crossbands, instead having irregular yellow or red spots on them, these sometimes being vaguely arranged in a very broken and irregular cross-limb configuration.

The upper body surface lacks an obvious pattern.

There are no dark patches of scales, bounded by whitish scales, radiating from the upper eye.

The subspecies *A. spinipes jackyae subsp. nov.* from the border ranges region of New South Wales and Queensland is like nominate *A. spinipes spinipes* in most respects, but can be readily separated from that subspecies by the following differences to that taxon, the dark patches of scales radiating from above the eye are either absent or indistinct and are not obviously bounded by whitish scales or not at all.

Furthermore the slightly irregular dark temporal streak running from the back of the eye towards the ear is small and broken, or alternatively small and narrow if unbroken, versus larger and unbroken in *A. spinipes spinipes.*

In terms of the presence of five (or rarely four) distinct whitish bars on the lower labials, separated by darker brownish-black bars both extending 3-5 scales down, the last of these extends across the equivalent upper labial to form an obvious stripe running into the eye. Where a similar configuration is rarely seen in some *A. spinipes spinipes*, the whitish marking on the upper labials is in the form of a faded spot, blob or flush rather than as a distinct line.

In *A. spinipes jackyae subsp. nov.* the ligher markings on the forelimbs form a pattern of irregular spotting as opposed to obvious crossbands as seen in *A. spinipes spinipes*.

The subspecies *A. spinipes wikiei subsp. nov.* from the general region encompassing the Sunshine Coast hinterland in south-east Queensland is superficially intermediate in form and appearance to the other species. However it can be readily separated from them all by the following suite of characters. Dark patches radiating from the upper eye are either absent, or if present, not bounded by white. The presence of five (or rarely four) distinct whitish bars on the lower labials is only in the form of a very faded pattern, versus distinct in each of *A. spinipes spinipes* and *A. spinipes jackyae subsp. nov.*.
The dorsal pattern of *A. spinipes wikiei subsp. nov.* is either faded or indistinct, versus distinct in both *A. spinipes spinipes* and *A. spinipes jackyae subsp. nov.*.

A. spinipes wikiei subsp. nov. lack any obvious white, whitish, yellow or red markings or crossbands on the forelimbs. The body may have white or greyish-white flecks or irregular crossbands, but not the obvious red or yellow spots as seen in *A. spinipes adelynae subsp. nov.*.

There are numerous quality photos of all four subspecies in numerous texts and also online, clearly showing the diagnostic features identified above.

Adelynhosersaur gen. nov. is monotypic for the type species *Adelynhosersaur spinipes* (Duméril and Bibron, 1851) and so the diagnosis below is for both. The species (and genus) is readily separated from other Australian *Tiaris* Duméril and Bibron, 1837 (the only genus it is likely to be confused with) and *Hypsilurus* from regions north of Australia, by the absence of a longitudinal row of grossly enlarged scales on the throat. In the other two genera, such scales are similar to those of the nuchal crest. The genus *Adelynhosersaur gen. nov.* is also separated from all other Amphibolurinae by the following suite of characters: grey, grey-brown or chocolate brown above, often suffused with green.

Immaculate or with dark brown flecks, spots of variegations and occasionally with obscure dark transverse bands across the top of the back and tail. Whitish or dirty brown below. Usually a broad, dark brown bar from the eye to the ear, and some darker bars on the jaws. The body scales are heterogeneous, the scales on the dorsum and flanks are small and keeled and with scattered, enlarged, strongly keeled or spinose scales, often aligned to form irregular transverse rows. A series of enlarged spinose scales on the upper surfaces of the limbs. There is a fairly strong nuchal crest continuous with a low but conspicuous dorsal crest. Gulars are keeled with a few scattered, larger, keeled scales, especially on the midline. Remaining ventral and caudal scales are strongly keeled. The head is large and wedgeshaped, with a thick, angular canthus rostralis which continues as an acute supraocular ridge. The tympanum is large and superficial. The nostril is subcircular, facing outwards and slightly backwards and downwards in an enlarged and somewhat swollen nasal scale lying below the canthal ridge. The adpressed hindlimb reaches to between the eye and the tip of the snout, the hindlimb being about 90 per cent of the snout-vent length and the tail being about 200 per cent of the snout-vent length, (adapted from Cogger, 2000).

A photograph of a typical specimen of this taxon is depicted in Swan (2008) (complete with a grossly erroneous distribution map on page 445), see specimen depicted at the bottom of page 447.

Distribution: Restricted to the coastal and near coastal parts of the northern central coast of New South Wales, Australia, in a region generally bounded by the Hawkesbury River to the south and the lower Hunter Valley in the north.

Etymology: Named in honour of my daughter, Adelyn Hoser, aged 17 as of 2016, from Park Orchards, Victoria, Australia in recognition of her significant contributions to herpetology and wildlife conservation in Australia. The generic name *Adelynhosersaur* Hoser, 2013 is also in her honour.

ADELYNHOSERSAUR SPINIPES JACKYAE SUBSP. NOV.

Holotype: A preserved specimen at the Queensland Museum, Brisbane, Queensland, Australia, specimen number J58004 collected at Levers Plateau, New South Wales, Australia, with a quoted Latitude -28.32, Longitude 152.85.

The Queensland Museum, Brisbane, Queensland, Australia is a goverment owned facility that allows access to its holdings.

Paratype: A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.141081 collected at Yabbra State Forest, New South Wales, Latitude -28.46, Longitude 152.67.

Diagnosis: The separation of *A. spinipes jackyae subsp. nov.* and the other relevant subspecies is as follows: The nominate form of *A. spinipes spinipes* (Duméril and Bibron, 1851) herein confined to the mid north coast of New South Wales is readily separated from the other species by the presence of five (or rarely four) distinct whitish bars on the lower labials, separated by darker brownish-black bars both extending 3-5 scales down, whereupon the colours abruptly merge to form a mottled appearance on the gular scales. There is also a well-defined, but slightly irregular dark temporal streak running from the back of the eye towards the ear, where it breaks up.

There are dark patches of scales, bounded by whitish scales, radiating from the upper eye.

Both fore and hind limbs have indistinct white crossbands.

The upper body surface has an obvious pattern.

The subspecies *A. spinipes adelynae subsp. nov.* from the New South Wales region bounded by the Hawkesbury River in the South and the Hunter Valley in the north, is readily separated from the other species by the absence of a well defined body pattern, instead being a reddish-brown all over with numerous irregular yellow spots. There are no white crossbands of any form on the limbs and there is no dark temporal streak running from the back of the eye towards the ear. Instead there is a narrow reddish flush at the same place. There is also a complete absence of five (or rarely four) distinct whitish bars on the lower labials, separated by darker brownish-black bars both extending 3-5 scales down. Instead the upper and lower labials are a near immaculate yellowish brown or grey colour. The limbs lack any form of lightish crossbands, instead having irregular yellow or red spots on them, these sometimes being vaguely arranged in a very broken and irregular cross-limb configuration.

The upper body surface lacks an obvious pattern.

There are no dark patches of scales, bounded by whitish scales, radiating from the upper eye.

The subspecies *A. spinipes jackyae subsp. nov.* from the border ranges region of New South Wales and Queensland is like nominate *A. spinipes spinipes* in most respects, but can be readily separated from that subspecies by the following differences to that taxon, the dark patches of scales radiating from above the eye are either absent or indistinct and are not obviously bounded by whitish scales or not at all.

Furthermore the slightly irregular dark temporal streak running from the back of the eye towards the ear is small and broken, or alternatively small and narrow if unbroken, versus larger and unbroken in *A. spinipes spinipes.*

In terms of the presence of five (or rarely four) distinct whitish bars on the lower labials, separated by darker brownish-black bars both extending 3-5 scales down, the last of these extends across the equivalent upper labial to form an obvious stripe running into the eye. Where a similar configuration is rarely seen in some *A. spinipes spinipes*, the whitish marking on the upper labials is in the form of a faded spot, rather than as a distinct line.

In *A. spinipes jackyae subsp. nov.* the ligher markings on the forelimbs form a pattern of irregular spotting as opposed to obvious crossbands.

The subspecies *A. spinipes wikiei subsp. nov.* from the general region encompassing the Sunshine Coast hinterland in south-east Queensland is superficially intermediate in form and appearance to the other species. However it can be readily separated from them all by the following suite of characters. Dark patches radiating from the upper eye are either absent, or if present, not bounded by white. The presence of five (or rarely four) distinct whitish bars on the lower labials is only in the form of a very faded pattern, versus distinct in each of *A. spinipes spinipes* and *A. spinipes jackyae subsp. nov.*.
The dorsal pattern of *A. spinipes wikiei subsp. nov.* is either faded or indistinct, versus distinct in both *A. spinipes spinipes* and *A. spinipes jackyae subsp. nov.*.

A. spinipes wikiei subsp. nov. lack any obvious white, whitish, yellow or red markings or crossbands on the forelimbs. The body may have white or greyish-white flecks or irregular crossbands.

There are numerous quality photos of all four subspecies in numerous texts and also online, clearly showing the diagnostic features identified above.

Adelynhosersaur gen. nov. is monotypic for the type species *Adelynhosersaur spinipes* (Duméril and Bibron, 1851) and so the diagnosis below is for both. The species (and genus) is readily separated from other Australian *Tiaris* Duméril and Bibron, 1837 (the only genus it is likely to be confused with) and *Hypsilurus* from regions north of Australia, by the absence of a longitudinal row of grossly enlarged scales on the throat. In the other two genera, such scales are similar to those of the nuchal crest. The genus *Adelynhosersaur gen. nov.* is also separated from all other Amphibolurinae by the following suite of characters: grey, grey-brown or chocolate brown above, often suffused with green.

Immaculate or with dark brown flecks, spots of variegations and occasionally with obscure dark transverse bands across the top of the back and tail. Whitish or dirty brown below. Usually a broad, dark brown bar from the eye to the ear, and some darker bars on the jaws. The body scales are heterogeneous, the scales on the dorsum and flanks are small and keeled and with scattered, enlarged, strongly keeled or spinose scales, often aligned to form irregular transverse rows. A series of enlarged spinose scales on the upper surfaces of the limbs. There is a fairly strong nuchal crest continuous with a low but conspicuous dorsal crest. Gulars are keeled with a few scattered, larger, keeled scales, especially on the midline. Remaining ventral and caudal scales are strongly keeled. The head is large and wedgeshaped, with a thick, angular canthus rostralis which continues as an acute supraocular ridge. The tympanum is large and superficial. The nostril is subcircular, facing outwards and slightly backwards and downwards in an enlarged and somewhat swollen nasal scale lying below the canthal ridge. The adpressed hindlimb reaches to between the eye and the tip of the snout, the hindlimb being about 90 per cent of the snout-vent length and the tail being about 200 per cent of the snout-vent length, (adapted from Cogger, 2000).

A photograph of a typical specimen of this taxon *A. spinipes jackyae subsp. nov.* is depicted on page 325 of Wilson and Swan (2003), showing a well-defined dorsal colour pattern, the dark patches of scales radiating from above the eye are not obviously bounded by whitish scales and that the dark temporal streak running from the back of the eye towards the ear is small.

Distribution: Restricted to the coastal and near coastal parts of the Border Ranges area of south-east Queensland and North-east New South Wales, Australia, including ranges immediately south of here, in a region generally bounded by the Brisbane River in the north.

Etymology: Named in honour of my daughter, Jacky Hoser aged 15 as of 2016, from Park Orchards, Victoria, Australia in recognition of her significant contributions to herpetology and wildlife conservation in Australia.

ADELYNHOSERSAUR SPINIPES WILKIEI SUBSP. NOV.

Holotype: A preserved specimen at the Queensland Museum, Brisbane, Queensland, Australia, specimen number J27724 collected at Little Yabba Creek, via Kenilworth, Sunshine Coast, Queensland with a quoted Latitude -26.60, Longitude 152.58.

The Queensland Museum, Brisbane, Queensland, Australia is a goverment owned facility that allows access to its holdings.

Paratype: A preserved specimen at the Queensland Museum, Brisbane, Queensland, Australia, specimen number J27748, collected at Gallangowan, via Kandanga, Queensland Australia, with a quoted Latitude -26.43, Longitude 152.28.

Diagnosis: The separation of *A. spinipes wilkiei subsp. nov.* and the other relevant subspecies is as follows: The nominate form of *A. spinipes spinipes* (Duméril and Bibron, 1851) herein confined to the mid north coast of New South Wales is readily separated from the other species by the presence of five (or rarely four) distinct whitish bars on the lower labials, separated by darker brownish-black bars both extending 3-5 scales down, whereupon the colours abruptly merge to form a mottled appearance on the gular scales. There is also a well-defined, but slightly irregular dark temporal streak running from the back of the eye towards the ear, where it breaks up.

There are dark patches of scales, bounded by whitish scales, radiating from the upper eye.

Both fore and hind limbs have indistinct white crossbands.

The upper body surface has an obvious pattern.

The subspecies *A. spinipes adelynae subsp. nov.* from the New South Wales region bounded by the Hawkesbury River in the South and the Hunter Valley in the north, is readily separated from the other species by the absence of a well defined body pattern, instead being a reddish-brown all over with numerous irregular yellow spots. There are no white crossbands of any form on the limbs and there is no dark temporal streak running from the back of the eye towards the ear. Instead there is a narrow reddish flush at the same place. There is also a complete absence of five (or rarely four) distinct whitish bars on the lower labials, separated by darker brownish-black bars both extending 3-5 scales down. Instead the upper and lower labials are a near immaculate yellowish brown or grey colour. The limbs lack any form of lightish crossbands, instead having irregular yellow or red spots on them, these sometimes being vaguely arranged in a very broken and irregular cross-limb configuration.

The upper body surface lacks an obvious pattern.

There are no dark patches of scales, bounded by whitish scales, radiating from the upper eye.

The subspecies *A. spinipes jackyae subsp. nov.* from the border ranges region of New South Wales and Queensland is like nominate *A. spinipes spinipes* in most respects, but can be readily separated from that subspecies by the following differences to that taxon, the dark patches of scales radiating from above the eye are either absent or indistinct and are not obviously bounded by whitish scales or not at all.

Furthermore the slightly irregular dark temporal streak running from the back of the eye towards the ear is small and broken, or alternatively small and narrow if unbroken, versus larger and unbroken in *A. spinipes spinipes.*

In terms of the presence of five (or rarely four) distinct whitish bars on the lower labials, separated by darker brownish-black bars both extending 3-5 scales down, the last of these extends across the equivalent upper labial to form an obvious stripe running into the eye. Where a similar configuration is rarely seen in some *A. spinipes spinipes*, the whitish marking on the upper labials is in the form of a faded spot, rather than as a distinct line.

In *A. spinipes jackyae subsp. nov.* the ligher markings on the forelimbs form a pattern of irregular spotting as opposed to obvious crossbands.

The subspecies *A. spinipes wikiei subsp. nov.* from the general region encompassing the Sunshine Coast hinterland in south-east Queensland is superficially intermediate in form and appearance to the other species. However it can be readily separated from them all by the following suite of characters. Dark patches radiating from the upper eye are either absent, or if present, not bounded by white. The presence of five (or rarely four) distinct whitish bars on the lower labials is only in the form of a very faded pattern, versus distinct in each of *A. spinipes spinipes* and *A. spinipes jackyae subsp. nov.*.
The dorsal pattern of *A. spinipes wikiei subsp. nov.* is either faded or indistinct, versus distinct in both *A. spinipes spinipes* and *A. spinipes jackyae subsp. nov.*.

A. spinipes wikiei subsp. nov. lack any obvious white, whitish, yellow or red markings or crossbands on the forelimbs. The body may have white or greyish-white flecks or irregular crossbands.

There are numerous quality photos of all four subspecies in numerous texts and also online, clearly showing the diagnostic features identified above.

Adelynhosersaur gen. nov. is monotypic for the type species *Adelynhosersaur spinipes* (Duméril and Bibron, 1851) and so the diagnosis below is for both. The species (and genus) is readily separated from other Australian *Tiaris* Duméril and Bibron, 1837 (the only genus it is likely to be confused with) and *Hypsilurus* from regions north of Australia, by the absence of a longitudinal row of grossly enlarged scales on the throat. In the other two genera, such scales are similar to those of the nuchal crest. The genus *Adelynhosersaur gen. nov.* is also separated from all other Amphibolurinae by the following suite of characters: grey, grey-brown or chocolate brown above, often suffused with green.

Immaculate or with dark brown flecks, spots of variegations and occasionally with obscure dark transverse bands across the top of the back and tail. Whitish or dirty brown below. Usually a broad, dark brown bar from the eye to the ear, and some darker bars on the jaws. The body scales are heterogeneous, the scales on the dorsum and flanks are small and keeled and with scattered, enlarged, strongly keeled or spinose scales, often aligned to form irregular transverse rows. A series of enlarged spinose scales on the upper surfaces of the limbs. There is a fairly strong nuchal crest continuous with a low but conspicuous dorsal crest. Gulars are keeled with a few scattered, larger, keeled scales, especially on the midline. Remaining ventral and caudal scales are strongly keeled. The head is large and wedgeshaped, with a thick, angular canthus rostralis which continues as an acute supraocular ridge. The tympanum is large and superficial. The nostril is subcircular, facing outwards and slightly backwards and downwards in an enlarged and somewhat swollen nasal scale lying below the canthal ridge. The adpressed hindlimb reaches to between the eye and the tip of the snout, the hindlimb being about 90 per cent of the snout-vent length and the tail being about 200 per cent of the snout-vent length, (adapted from Cogger, 2000).

A photograph of a typical specimen of this taxon is depicted on page 201 of Wilson (2015), showing the relatively indistinct white bars on the lower labials (or them being absent) and a general lack of an obvious dorsal colour pattern, this being a specimen from the southernmost extremity of the range of this subspecies.

Distribution: Restricted to the coastal and near coastal parts of wetter south-east Queensland in an area generally north of the Brisbane River and south of the Conondale Range (including them) in suitable hilly rainforest remnants.

Etymology: Named in honour of Andrew Damien Wilkie born 8 November 1961 at Tamworth, New South Wales, Australia. He is as of 2016 an Australian politician and independent Federal member for Denison. He has been an army officer and an intelligence analyst.

In 2003 Wilkie resigned from his position in the Office of National Assessments, an Australian intelligence agency, over concerns that intelligence was being exaggerated for political purposes in making the case for Australia's contribution to the 2003 invasion of Iraq under the Howard Liberal government.

Since then he has been active in Australian politics. He was a Greens candidate for the federal Division of Bennelong in the 2004 federal election and for the Senate in Tasmania at the 2007 federal election. In 2010 he stood as an independent candidate for the state seat of Denison at the Tasmanian state election, narrowly missing out on the final vacancy. Later in the year, again as an independent candidate, he ran for the federal seat of Denison at the 2010 federal election and won, finishing third on the primary vote but winning the seat after the distribution of preferences. Wilkie finished first on the primary vote at the 2013 federal election and increased his margin.

He has been an outspoken critic of Australian and other western governments sending troops to third-world countries such as Iraq to kill innocent men, women and children on the basis of lies such as US President George Bush's alleged "weapons of mass destruction" in 2003.

In July 2016, following the issue of the UK Chilcot Report, criticizing former UK PM Tony Blair for lying to the public about his excuse to declare war against Iraq, Wilkie told the Australian media that former Liberal Prime Minister, John Howard and other political leaders of the time, had "blood on their hands" as a result of their illegal and improper sending Australian military forces to the second Iraq Gulf war, causing Australia to become a so-called terrorist target (Baxendale 2016, Hinman 2016, Osborne 2016, Tillett 2016).

NOTES ON THE DESCRIPTIONS FOR ANY POTENTIAL REVISERS

Unless mandated by the rules of the *International Code of Zoological Nomenclature*, none of the spellings of the newly proposed names should be altered in any way. Should one or more newly named taxa be merged by later authors to be treated as a single subspecies, the order of prority of retention of names should be the order (page priority) of the descriptions within this text, that is *adelynae*, *jackyae*, *wilkiei.*

REFERENCES CITED

Baxendale, R. 2016. Andrew Wilkie blames Iraq war for Bali bombings, Lindt Cafe siege. *The Australian*, 7 July, online at: http://www.theaustralian.com.au/national-affairs/andrew-wilkie-blames-iraq-war-for-bali-bombings-lindt-cafe-siege/news-story/

b2fbcbab2f9379c3ab39f0d8ba31f21d

Boulenger, G. A. 1885. *Catalogue of the Lizards in the British Museum (Nat. Hist.) I. Geckonidae, Eublepharidae, Uroplatidae, Pygopodidae, Agamidae.* London:450 pp.

Cogger, H. G. 2014. *Reptiles and Amphibians of Australia.* 7th ed. CSIRO Publishing, xxx+1033 pp.

Cogger, H. G., Cameron, E. E. and Cogger, H. M. 1983. *Zoological Catalogue of Australia (1): Amphibia and Reptilia.* Australian Government Publishing Service, Canberra, ACT, Australia:313 pp.

Court of Appeal Victoria. 2014. Hoser v Department of Sustainability and Environment [2014] VSCA 206 (5 Sept. 2014).

Denzer, W. and Manthey, U. 2016. Remarks on the taxonomy and nomenclature of the genus *Hypsilurus* Peters, 1867 (Reptilia, Agamidae, Amphibolurinae). *Zoosyst. Evol.* 92(1):103-110.

Duméril, A. M. C. and Bibron, A. H. A. 1851. *Catalogue méthodique de la collection des reptiles du Muséum d'Histoire Naturelle de Paris.* Gide et Baudry/Roret, Paris:224 pp.

Fry, D. B. 1915. Descriptions and notes on three lizards. *Proc. Roy. Soc. Queensland* 27:86-88.

Harvey, M. B., Barker, D. G., Ammerman, L. K. and Chippendale, P. T. 2000. Systematics of pythons of the *Morelia amethistina* complex (Serpentes: Boidae) with the description of three new species. *Herpetological Monographs* (The Herpetologists League Incorporated) 14:139-185.

Hinman, P. 2016. Iraq War was a crime: John Howard should face justice. *Green Left Weekly*, 8 July, online at: https://www.greenleft.org.au/node/62105

Hoser, R. T. 1989. *Australian Reptiles and Frogs.* Pierson and Co., Mosman, NSW, 2088, Australia: 238 pp.

Hoser, R. T. 1991. *Endangered Animals of Australia.* Pierson Publishing, Mosman, NSW, 2088, Australia: 240 pp.

Hoser, R. T. 2013. A seven way division of the Amphibolurinae (Squamata: Sauria: Agamidae). *Australasian Journal of Herpetology* 21:33-36.

Hoser, R. T. 2014. A logical new taxonomy for the Asian subfamily Draconinae based on obvious phylogenetic relationships and morphology of species (Squamata: Sauria: Agamidae: Draconinae). *Australasian Journal of Herpetology* 22:9-59.

Longley, G. 1943. Notes on *Goniocephalus cristipes. Proc. R. Zool. Soc. NSW.* 1942-43:30-31.

Manthey, U. and Denzer, W. 2006. A revision of the Melanesian-Australian angle head lizards of the genus *Hypsilurus* (Sauria: Agamidae: Amphibolurinae), with description of four new species and one new subspecies. *Hamadryad* 30(1-2):1-40.

Moritz, C., Joseph, L. and Adams, M. 1993. Cryptic diversity in an endemic rainforest skink (*Gnypetoscincus queenslandiae*). *Biodiversity and Conservation* 2:412-425.

Osborne, P. 2016. Howard, Libs stand by Iraq war. 7 July, online news story at: http://www.news.com.au/national/breaking-news/we-take-full-responsibility-aust-on-iraq/news-story/c85376d2b7c0465f5a62e66ad2cb0540

Pianka, E. R. and Vitt, L. J. 2003. *Lizards - Windows to the Evolution of Diversity.* University of California Press, Berkeley:347 pp.

Ride, W. D. L. (*ed.*) *et al.* (on behalf of the International Commission on Zoological Nomenclature) 1999. *International code of Zoological Nomenclature* (Fourth edition). The Natural History Museum - Cromwell Road, London SW7 5BD, UK (also commonly cited as "The Rules", "Zoological Rules" or "ICZN 1999").

Rummery, C., Shine, R., Houston, D. L. and Thompson, M. B. 1995. Thermal Biology of the Australian Forest Dragon, *Hypsilurus spinipes* (Agamidae). *Copeia* 1995(4):818-827.

Swan, M. 2008. *Keeping and Breeding Australian Lizards.* Mike Swan Herp Books, Lilydale, Victoria, Australia:615 pp.

Tillett, A. 2016. Howard denies he was wrong on Iraq war. The West Australian, 8 July, online at: http://www.pressreader.com/australia/the-west-australian/20160708/281715498942298

VCAT (Victorian Civil and Administrative Tribunal). 2015. *Hoser v Department of Environment Land Water and Planning* (Review and Regulation) [2015] VCAT 1147 (30 July 2015).

Wells, R. W. and Wellington, C. R. 1983. A synopsis of the Class Reptilia in Australia. *Australian Journal of Herpetology* 1(3-4):73-129.

Wells, R. W. and Wellington, C. R. 1985. A classification of the Amphibia and Reptilia of Australia. *Australian Journal of Herpetology Supplementary Series* 1:1-61.

Wilson, S. 2015. *A field guide to Reptiles of Queensland* (Second edition). Reed New Holland, Chatswood, New South Wales, Australia:304 pp.

Wilson, S. and Swan, G. 2003. *A complete guide to reptiles of Australia.* New Holland, Chatswood, NSW, Australia:558 pp.

CONFLICT OF INTEREST

The author has no known conflicts of interest in terms of this paper and conclusions within.

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Stuck in the jungle! A break up of the Australian agamid species *Hypsilurus boydii* (Macleay, 1884).

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ABSTRACT

Fieldwork by this author in wet tropics of Queensland, Australia spanning some two decades yielded morphologically distinct variants of the putative species *Hypsilurus boydii* (Macleay, 1884).

These populations, separated by an area of low hills and lowlands around Cairns and immediately north of this point, share the same geographical gap in their range as for other putative rainforest obligate species that have been shown both morphologically and by molecular studies to represent separate species level taxa.

By way of example Moritz *et al*. 1993, showed a mtDNA divergence of 8.6% for two populations of wet tropics skinks divided by the same barrier, indicating a 4-5 MYA divergence.

Noting the inability or lack of inclination of *Hypsilurus sensu lato* to traverse habitats that are not thermally inert, as detailed by Rummery *et al*. (1995), it is clear that the isolation of these morphologically distinct populations is not recent.

Therefore in order to allow other herpetologists to do more meaningful studies on each biological entity and to facilitate proper conservation and management for each biological entity, this paper formally names the currently unnamed form from the northern wet tropics of Australia.

In accordance with the rules of the *International Code of Zoological Nomenclature* (Ride *et al*. 1999) *Hypsilurus boydii ruivenkamporum subsp. nov*. is named in honour of Gerard Ruivenkamp and his son Nathan Ruivenkamp of Warrandyte, Victoria, Australia in recognition of their services to herpetology spanning more than a decade.

Keywords: Taxonomy; Nomenclature; Lizards; Dragon; Agamidae; Queensland; Australia; Wet tropics; genus; *Hypsilurus*; species; *boydii*; new subpecies; *ruivenkamporum.*

INTRODUCTION

Fieldwork by this author in the wet tropics of far north Queensland, Australia spanning some two decades yielded morphologically distinct variants of the putative species *Hypsilurus boydii* (Macleay, 1884).

In the light of more recent papers dealing with population splits of putative species in the wet tropics of far north Queensland (e.g. Moritz *et al*. 1993 and sources cited therein), the idea that more than one taxon was being labelled as *H. boydii* was revisited by myself in the post year 2000 period. In the ten years that followed a substantial body of evidence was gathered.

An illegal armed raid led by corrupt wildlife officers, Glenn Sharp and Emily Gibson on 17 August 2011, netted all computers, hard drives and the like as well as other vitally important research files and other important materials at our facility. Much of this was either not returned or returned damaged, effectively scuttling the relevant research project (Court of Appeal, Victoria 2014 and VCAT 2015).

However with ongoing habitat destruction in the north Queensland region and accelerating human population growth, I have made the decision to publish a formal description of the as yet unnamed northern form of *H. boydii* so that the species can be properly managed and not allowed to become extinct as a result some kind of benign neglect by government regulators.

The two North Queensland populations of *H. boydii*, separated by an area of low hills and lowlands around Cairns and immediately north of this point, share the same geographical gap in their range as for other putative rainforest obligate species that have been shown both morphologically and by molecular studies to represent separate species level taxa.

By way of example Moritz *et al*. (1993), showed mtDNA divergence of 8.6% for two populations of wet tropics skinks, putatively of a single species, divided by the same barrier, indicating a 4-5 MYA divergence.

Noting the inability or lack of inclination of *Hypsilurus sensu lato* to traverse habitats that are not thermally inert, as detailed by Rummery *et al*. (1995) for the species *Adelynhosersaur spinipes* (Duméril and Bibron, 1851), it is clear that the isolation of these morphologically distinct populations of *H. boydii* is not recent.

Therefore and as already stated, that in order to allow other herpetologists to do more meaningful studies on each biological entity and to facilitate proper conservation and management for each biological entity, this paper formally names the currently unnamed form from the northern wet tropics of Australia.

In accordance with the rules of the *International Code of Zoological Nomenclature* (Ride *et al*. 1999) *Hypsilurus boydii ruivenkamporum subsp. nov*. is named in honour of Gerard Ruivenkamp and his adilt son Nathan Ruivenkamp of Warrandyte, Victoria, Australia in recognition of their services to herpetology spanning more than a decade.

As each population are clearly evolving independently, they are herein formally treated as subspecies according to the *International Code of Zoological Nomenclature* (Ride *et al.* 1999).

This is the most conservative level of taxonomic recognition allowed by the *International Code of Zoological Nomenclature.*

I also note that it is likely that further study may result in the formally named subspecies being elevated to full species status.

Type locality for the species *H. boydii* is the Herbert River area, Queensland, a location south of Cairns, which is the approximate point of barrier between the southern and to date unnamed northern form.
While the taxonomic judgements made herein are based on a direct inspection of specimens from each of the relevant populations, it is prudent for me to refer to some of the literature relevant to the species complex herein.

Key references include Boulenger (1885), Cogger (2014), Cogger *et al*. (1983), Denzer and Manthey (2016), Greenbaum (2000), Hoser (2013, 2014), Kahl *et al.* (1980), Macleay (1884), Manthey and Denzer (2006), Wells (1972), Wells and Wellington (1983, 1985), Wilson (2015), Wilson and Swan (2003), Zwinenberg (1974), and sources cited therein.

While it could be argued that the differences between specimens in the isolated populations are not worthy of taxonomic recognition, this view is contradicted by those expressed and actioned by Harvey *et al.* (2000) or Keogh *et al.* (2003). Also see the relevant paper of Moritz *et al.* (1993) in terms the issues of cryptic diversity of putative rainforest species in Australia, based on the home range fidelity of individual specimens.

HYPSILURUS BOYDII RUIVENKAMPORUM SUBSP. NOV.

Holotype: A preserved specimen at the Queensland Museum, Brisbane, Australia, specimen number: J65679, collected at Chapmans Corner, near Bloomfield. North Queensland, Australia, Latitude -15.94, Longitude 145.32.

The Queensland Museum, Brisbane, Australia is a government-owned facility that allows access to its specimens.

Paratypes: 1/ A preserved specimen at the Queensland Museum, Brisbane, Australia, specimen number: J58108 from Upper Roaring Meg, Queensland, Australia, Latitude -16.07, Longitude 145.42.

2/ A preserved specimen at the Australian Museum, Sydney, Australia, specimen number: Herpetology:R.2254, from Bloomfield River, Cooktown, Queensland, Australia, Latitude -15.97, Longitude 145.32.

Diagnosis: Both subspecies of *H. boydii* are diagnosed and separated from other *Hypsilurus* Peters, 1867 and *Adelynhosersaur* Hoser, 2013 by the following unique suite of characters: It is a medium-sized, short tailed species with heterogeneous dorsal scalation and a discontinuous vertebral crest. Several enlarged plates and large conical scales next to the tympanum; no row of enlarged submaxillaries; anterior edge of the gular pouch with enlarged, triangular scales. *H. boydii* differs from *H. dilophus* and *A. spinipes* by the presence of plates and large conical scales below the tympanum; all other species are characterised by a heterogeneous dorsal scalation.

Adult males of *H. boydii ruivenkamporum subsp. nov*. are readily separated from *H. boydii boydii* by the following suite of characters: *H. boydii ruivenkamporum subsp. nov.* have large white raised conical scales at the lower back of the head, versus orange, pink or pinkish white in the nominate form.

In both sexes of *H. boydii ruivenkamporum subsp. nov*. there are a large number of small raised yellow scales (dots) on the lower flanks, versus a small number in the nominate form.

The dorsal colour of *H. boydii ruivenkamporum subsp. nov*. includes distinct crossbands across the spine, versus indistinct or absent in the nominate form.

The spines running down the centre of the back of *H. boydii ruivenkamporum subsp. nov*. have an obvious reddish colour or reddish tinge, versus absent in *H. boydii boydii.*

Distribution: The newly named subspecies *H. boydii ruivenkamporum subsp. nov.* is restricted to the northern wet tropics in a region generally bounded by Jullatten and Mount Lewis in the south and Cape Tribulation in the north, North Queensland, Australia. The nominate form of *H. boydii boydii* is generally found in a region bounded by Mount Bartle Frere in the north, west and including the Atherton Tableland south to Mount Sullivan in North Queensland, Australia.

Etymology: Named in honour of Gerard Ruivenkamp (father) and Nathan Ruivenkamp (adult son with own children), of Warrandyte, Victoria, Australia in recognition of logistical support in their roles as builders and electricians for the wildlife conservation business Snakebusters, who do Australia's best wildlife shows and displays and fund critically important scientific research.

NOTES ON THIS DESCRIPTION FOR ANY POTENTIAL REVISORS

Unless mandated by the rules of the *International Code of Zoological Nomenclature*, the spelling of the newly proposed name should not be altered in any way.

REFERENCES CITED

Boulenger, G. A. 1885. *Catalogue of the Lizards in the British Museum (Nat. Hist.) I. Geckonidae, Eublepharidae, Uroplatidae, Pygopodidae, Agamidae.* London:450 pp.

Cogger, H. G. 2014. *Reptiles and Amphibians of Australia*, 7th edition. CSIRO Publishing, xxx+1033 pp.

Cogger, H. G., Cameron, E. E. and Cogger, H. M. 1983. *Zoological Catalogue of Australia (1): Amphibia and Reptilia*. Australian Government Publishing Service, Canberra, ACT, Australia:313 pp.

Court of Appeal Victoria. 2014. Hoser v Department of Sustainability and Environment [2014] VSCA 206 (5 Sept. 2014).

Denzer, W. and Manthey, U. 2016. Remarks on the taxonomy and nomenclature of the genus *Hypsilurus* Peters, 1867 (Reptilia, Agamidae, Amphibolurinae). *Zoosyst. Evol*. 92(1):103-110.

Duméril, A. M. C. and Bibron, A. H. A. 1851. *Catalogue méthodique de la collection des reptiles du Muséum d'Histoire Naturelle de Paris*. Gide et Baudry/Roret, Paris:224 pp.

Greenbaum, E. 2000. Herpetofaunal observations in disparate habitats in south Australia, New South Wales, and Queensland, Australia. *Herpetological Bulletin* (72):6-16.

Harvey, M. B., Barker, D. G., Ammerman, L. K. and Chippendale, P. T. 2000. Systematics of pythons of the *Morelia amethistina* complex (Serpentes: Boidae) with the description of three new species. *Herpetological Monographs* (The Herpetologists League Incorporated) 14:139-185.

Hoser, R. T. 2013. A seven way division of the Amphibolurinae (Squamata: Sauria: Agamidae). *Australasian Journal of Herpetology* 21:33-36.

Hoser, R. T. 2014. A logical new taxonomy for the Asian subfamily Draconinae based on obvious phylogenetic relationships and morphology of species (Squamata: Sauria: Agamidae: Draconinae). *Australasian Journal of Herpetology* 22:9-59.

Kahl, B., Gaupp, P. and Schmidt, G. 1980. *Das Terrarium.* Falken Verlag, Niederhausen (Germany):336 pp.

Keogh, J. S., Scott, I. A. W., Fitzgerald, M. and Shine, R. 2003. Molecular phylogeny of the Australian venomous snake genus *Hoplocephalus* (Serpentes, Elapidae) and conservation genetics of the threatened *H. stephensii*. *Conservation Genetics* 4:57-65.

Macleay, W. 1884. Notes on some reptiles from the Herbert River, Queensland. *Proc. Linn. Soc. NSW.* 8:432-436.

Manthey, U. and Denzer, W. 2006. A revision of the Melanesian-Australian angle head lizards of the genus *Hypsilurus* (Sauria: Agamidae: Amphibolurinae), with description of four new species and one new subspecies. *Hamadryad* 30(1-2):1-40.

Moritz, C., Joseph, L. and Adams, M. 1993. Cryptic diversity in an endemic rainforest skink (*Gnypetoscincus queenslandiae*). *Biodiversity and Conservation* 2:412-425.

Ride, W. D. L. (*ed.*) *et al.* (on behalf of the International Commission on Zoological Nomenclature) 1999. *International code of Zoological Nomenclature* (Fourth edition). The Natural History Museum - Cromwell Road, London SW7 5BD, UK.

Rummery, C., Shine, R., Houston, D. L. and Thompson, M. B. 1995. Thermal Biology of the Australian Forest Dragon, *Hypsilurus spinipes* (Agamidae). *Copeia* 1995(4):818-827.

VCAT (Victorian Civil and Administrative Tribunal). 2015. *Hoser v Department of Environment Land Water and Planning* (Review and Regulation) [2015] VCAT 1147 (30 July 2015).

Wells, R. W. 1972. Notes on *Goniocephalus boydii* (Macleay). *Herpetofauna* (Sydney, Australia) 5:24.

Wells, R. W. and Wellington, C. R. 1983. A synopsis of the Class Reptilia in Australia. *Australian Journal of Herpetology* 1(3-4):73-129.

Wells, R. W. and Wellington, C. R. 1985. A classification of the Amphibia and Reptilia of Australia. *Australian Journal of Herpetology Supplementary Series* 1:1-61.

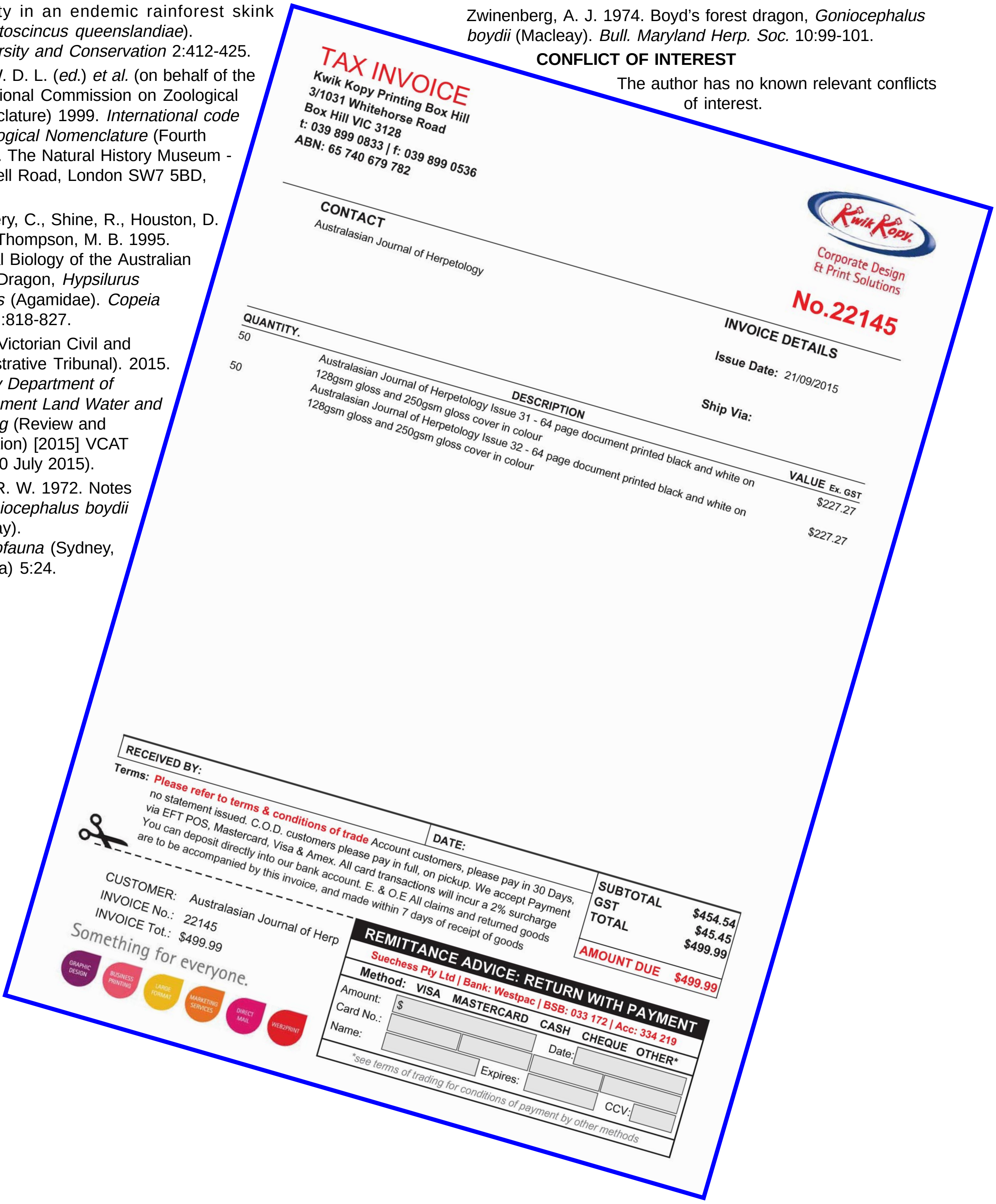
Wilson, S. 2015. *A field guide to Reptiles of Queensland* (Second edition). Reed New Holland, Chatswood, New South Wales, Australia:304 pp.

Wilson, S. and Swan, G. 2003. *A complete guide to reptiles of Australia*. New Holland, Chatswood, NSW, Australia:558 pp.

Zwinenberg, A. J. 1974. Boyd's forest dragon, *Goniocephalus boydii* (Macleay). *Bull. Maryland Herp. Soc.* 10:99-101.

CONFLICT OF INTEREST

The author has no known relevant conflicts of interest.



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No longer a monotypic lizard genus. A new species of *Gnypetoscincus* Wells and Wellington, 1983 from the Wet Tropics of North Queensland, Australia.

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ABSTRACT

The species of lizard originally described as *Tropidophorus queenslandiae* De Vis, 1890, from Australia's "wet tropics" was first transferred out of that genus by Wells and Wellington in 1983.

They erected a new monotypic genus *Gnypetoscincus* to accommodate the taxon. At all materially relevant times to the present, all authors have treated populations of these lizards restricted to the hillier parts of the wet tropics of Australia as being of just one species.

However when engaged in extensive fieldwork in the region in the early 1980's I formed the view that there were in fact two separate allopatric species under the one label.

A molecular study by Moritz *et al.* in 1993 confirmed this to be the case with the data they presented. However the authors failed to explicitly state this obvious fact in their conclusions, indicating that they remained of the belief that there was only one species involved, albeit two highly divergent lineages.

As a result, all authors in the following 23 years have treated these lizards as a single species taxon.

Drawing on the obvious morphological differences between the southern and northern populations of these lizards, previously not noted by any other author, as well as the molecular results published by Moritz *et al.* in 1993, showing a mtDNA sequence divergence of 8.6% for the two populations, this paper formally describes as a new species the previously unnamed northern form. It is called *Gnypetoscincus smythi sp. nov.* recognizing the significant contributions to herpetology by Michael Smyth of Ringwood, Victoria, Australia.

Keywords: Taxonomy; Nomenclature; Lizards; Skink; Queensland; Australia; wet tropics; genus; *Gnypetoscincus*; species; *queenslandiae*; new species; *smythi.*

INTRODUCTION

From 1890 when De Vis first described a north Queensland lizard species *Tropidophorus queenslandiae* to 1983, it had attracted little if any attention from taxonomists, who considered the generic placement of the putative species as correct.

This was challenged by Wells and Wellington (1983), who copped considerable flak from the wider herpetological community at the time, even though they affirmed their position in their major paper of 1985.

Their new genus was *Gnypetoscincus* Wells and Wellington, 1983.

Molecular studies including that of Moritz *et al.* (1993) affirmed the actions of Wells and Wellington (1983, 1985) and since 1993, no serious herpetologist has doubted this position as seen by the retention of this status quo by very conservative text published by Cogger (2014).

As mentioned in the abstract, at all materially relevant times to the present, all authors have treated populations of these lizards from the wet tropics of Australia as being of just one species.

However when engaged in extensive fieldwork in the region in the early 1980's and able to view many live specimens I formed the view that there were in fact two separate allopatric species being lumped under the one label.

I note here that I formed a similar view for other putative species of skinks and geckos similarly restricted to the most humid of hilly rainforest habitats in the same region. That is, what were being treated as single species were in fact two!

A molecular study by Moritz *et al.* (1993) in my view confirmed this to be the case for the genus *Gnypetoscincus* with the data they presented, this most significantly being an 8.6% mtDNA sequence divergence between the population centred in the ranges south and west of Cairns and those in the ranges north of the lowlands around Cairns and immediately north of there. However the authors failed to properly consider this obvious fact in their conclusions, except for one oblique reference to the fact that there may be two species and not one, thereby indicating that they remained of the belief that there was only one species involved.

As a result, all authors in the following 23 years have treated these lizards as a single species taxon.

Drawing on the obvious morphological differences between the southern and northern populations of these lizards, this paper formally describes as a new species the unnamed northern form as *Gnypetoscincus smythi sp. nov.* in accordance with the rules of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999).

The formal description is published below.

In terms of arriving at my decision to give the northern taxon formal recognition, I also note the following key facts.
The type locality for the southern (named species) is Bellenden Ker, just south of Cairns, Qld. Cogger *et al.* (1983) also cite Herberton, which also includes the range for the southern form.

No name is currently available for the northern lineage necessitating myself creating one now.

Moritz *et al.* (1993), wrote: “This species and thus the genus is restricted to the wet tropical rainforests, occurring from near Cooktown in the north, to the southern Cardwell Ranges, a linear distance of only 275 km.” In terms of the distribution of both forms and the geographic break between populations in the lowlands region immediately north of Cairns, Moritz *et al.* (1993), wrote: “The geographic location of the genetic break is intriguing. The rainforests of the Atherton Tableland (localities 3-7; Fig. 1) and those on the Carbine Tableland (i.e. Mt Lewis) and areas to the north are currently connected by remnants of lowland rainforest and a thin strip of rainforest along the eastern face of the Great Dividing range (Bell *et al.*, 1987). This relatively dry zone is recognized as a significant biogeographic barrier to mammals (Winter *et al.*, (sic) 1984; Crome, 1990).”

The mtDNA sequence divergence between the northern and southern populations was reported by Moritz *et al.* (1993), as being in the order of 8.6%, representing a likely 4-5 million year divergence between the two populations. Considerably lesser divergences (under 5% mtDNA divergences) between populations of other reptiles have led to species being erected to account for each population (e.g. Harvey *et al.* 2000).
Moritz *et al.* (1993) also stated “the northern vs southern populations appear to represent very distinct evolutionary lineages that should be considered separately in any analyses of ecology, biogeography or conservation status. According to some views (e.g. Frost and Hillis, 1990), these separate lineages should be recognised as separate species.”
My view obviously concurs with that of Frost and Hillis (1990) in that I herein formally name the northern lineage as a new species.

What hasn’t been noted anywhere in the literature to date are the obvious morphological differences between specimens in each population. The most obvious is the ventral patterning, which in both forms is mainly light whitish-yellow in colour with obvious darker markings. In the nominate southern species, these markings are heavy and nearly black, wheras in the northern taxon, these markings are thin to moderate and a lighter brown colour. The southern species has more dark pigment on the belly, versus more light on the northern one.

Dorsally, the northern taxon specimens have relatively indistinct lighter flecks or indistinct broken crossbands, versus distinct and significant lighter markings as part of the dorsal pattern in the southern species.

I also note that unless this potentially threatened northern population has a name, it cannot possibly be managed by any government conservation authority!

Publications relevant to the lizards within *Gnypetoscincus* and the “new” taxonomic judgement made herein include the following: Bell *et al.*, (1987), Cogger (2014), Cogger *et al.* (1983), Covacevich *et al.* (1993), Crome (1990), Cunningham (1993), Cunningham and Moritz (1998), de Vis (1890), Frost and Hillis (1990), Greer (1979), Harvey *et al.* (2000), Naylor (1980), Moritz *et al.* (1993), Pianka and Vitt (2003), Reeder (2003), Skinner *et al.* (2013), Sumner *et al.* (1999), Wells and Wellington (1983, 1985), Wilson and Swan (2010) Winter *et al.* (1984) and sources cited therein.

Notwithstanding the theft of relevant materials from this author in an illegal armed raid on 17 August 2011, which were not returned in spite of later court orders to have this material returned (Court of Appeal Victoria 2014 and VCAT 2015), I have made a decision to publish this paper in view of the conservation significance attached to the formal recognition of unnamed species and on the basis that further delays may in fact put this unnamed taxon at greater risk of extinction.

It is also worth noting the ongoing rapid human population growth in the North Queensland area and the associated influences of habitat destruction and potential for introduced pests and pathogens to attack vulnerable rainforest populations.

GNYPETOSCINCUS SMYTHI SP. NOV.

Holotype: A specimen in the Queensland Museum, Brisbane, Queensland, Australia, specimen number: J60740, collected at Thornton Peak, North Queensland, Australia, Latitude -16.10, Longitude 145.34.

The Queensland Museum, Brisbane, Queensland, Australia, allows access to its holdings.

Paratypes: Two specimens at the Queensland Museum, Brisbane, Queensland, Australia, specimen number: J47622, collected at Mt Lewis, via Mt Molloy, North Queensland, Australia, Latitude -16.58, Longitude 145.28 and specimen number: J60877, collected at Mount Finnigan, North Queensland, Australia, Latitude -15.82, Longitude 145.29.

Diagnosis: *Gnypetoscincus smythi sp. nov.* is most readily separated from *Gnypetoscincus queenslandiae* (De Vis, 1890), by colouration.

The most obvious is the ventral patterning, which in both species is a light whitish-yellow in colour with obvious darker markings. In the nominate southern form (*G. queenslandiae*), these darker markings are heavy and nearly black, whereas in the northern taxon, these markings are thin to moderate and a lighter medium brown colour. The southern species has more dark pigment on the belly, or rarely dark and light pigment in even amounts, versus significantly more light pigment on the venter (versus darker markings) in the the northern species (*Gnypetoscincus smythi sp. nov.*).

Dorsally, the northern taxon specimens (*Gnypetoscincus smythi sp. nov.*) have relatively indistinct lighter flecks or indistinct broken crossbands, versus distinct and significant lighter markings as part of the dorsal pattern in *G. queenslandiae*, but this character is both variable in specimens and also depending on age and stage of the shedding cycle, making it a potentially unreliable diagnostic character in the absence of locality data.

In preserved specimens the dark pigment (dorsally and ventrally) fades significantly.

Diagnostic characters used to separate both species of *Gnypetoscincus* (treated as one) from all other Australian skinks is found on page 571 of Cogger (2014).

Distribution: The northern wet tropics of Australia, in a region generally commencing about 50 km north of Cairns, Queensland, Australia, to north of Cape Tribulation.

Etymology: Named in honour of Michael Smyth, of Ringwood, Victoria, Australia, who has worked with Snakebusters, Australia’s best reptiles shows, for a decade. His contributions to the conservation of Australian wildlife and associated scientific research has been significant.

REFERENCES CITED

Bell, F. C., Winter, J. W., Pahl, L. I. and Atherton, R. G. 1987. Distribution, area and tenure of rainforest in northeastern Australia. *Proc. R. Soc. Qld*, 98:27-39.

Cogger, H. G. 2014. *Reptiles and Amphibians of Australia*. 7th ed. CSIRO Publishing, xxx+1033 pp.

Cogger, H. G., Cameron, E. E. and Cogger, H. M. 1983. *Zoological Catalogue of Australia (1): Amphibia and Reptilia*.

Australian Government Publishing Service, Canberra, ACT, Australia:313 pp.

Court of Appeal Victoria. 2014. Hoser v Department of Sustainability and Environment [2014] VSCA 206 (5 September 2014).

Covacevich, J. A., Couper, P. J. and James, C. 1993. A new skink, *Nangura spinosa gen. et sp. nov.*, from a dry rainforest of southeastern Queensland. *Memoirs of the Queensland Museum* 34(1):159-167.

Crome, F. H. J. 1990. Vertebrate and successions. pp. 53-64. in Webb, L. J. and Kikkawa, J. (eds) *Australian Tropical Rainforests, Science, Values, Meaning.* CSIRO, Melbourne, Australia.

Cunningham, M. 1993. Reproductive biology of the Prickly Forest Skink, *Gnypetoscincus queenslandiae*, an endemic species from northern Queensland. Mem. *Memoirs of the Queensland Museum* 34(1):131-138.

Cunningham, M. and Moritz, C. 1998. Genetic effects of forest fragmentation on a rainforest restricted lizard (Scincidae: *Gnypetoscincus queenslandiae*). *Biological Conservation* 83(1):19-30.

de Vis, C. W. 1890. Descriptions of two lizards of genera new to Australian Herpetology. *Proceedings of the Linnean Society of New South Wales*, 4:1034-1036 [1889].

Frost, D. R. and Hillis, D. M. 1990. Species in concept and practice: Herpetological applications. *Herpetologica* 46:87-104.

Greer, A. E. 1979. A phylogenetic subdivision of Australian skinks. *Records of the Australian Museum* 32: 339-371.

Harvey, M. B., Barker, D. G., Ammerman, L. K. and Chippendale, P. T. 2000. Systematics of pythons of the *Morelia amethistina* complex (Serpentes: Boidae) with the description of three new species. *Herpetological Monographs* (The Herpetologists League Incorporated) 14:139-185.

Moritz, C., Joseph, L. and Adams, M. 1993. Cryptic diversity in an endemic rainforest skink (*Gnypetoscincus queenslandiae*). *Biodiversity and Conservation* 2:412-425.

Naylor, L. M. 1980. The maintenance of a group of prickly forest skinks (*Tropidophorus queenslandiae* de Vis), in captivity. *Thylacinus*: *Journal of the Australian Society of Zookeepers* 5:5-6.

Pianka, E. R. and Vitt, L. J. 2003. *Lizards - Windows to the Evolution of Diversity.* University of California Press, Berkeley, USA:347 pp.

Reeder, T. W. 2003. A phylogeny of the Australian *Sphenomorphus* group (Scincidae: Squamata) and the phylogenetic placement of the crocodile skinks (*Tribolonotus*): Bayesian approaches to assessing congruence and obtaining confidence in maximum likelihood inferred relationships. *Molecular Phylogenetics and Evolution* 27:384-397.

Ride, W. D. L. (*ed.*) *et al.* (on behalf of the International Commission on Zoological Nomenclature) 1999. *International code of Zoological Nomenclature* (Fourth edition). The Natural History Museum - Cromwell Road, London SW7 5BD, UK (also commonly cited as “The Rules”, “Zoological Rules” or “ICZN 1999”).

Skinner, A., Hutchinson, M. N., and Lee, M. S. Y. 2013. Phylogeny and Divergence Times of Australian *Sphenomorphus* Group Skinks (Scincidae, Squamata). *Molecular Phylogenetics and Evolution* 69(3):906-918.

Sumner, J., Moritz, C. and Shine, R. 1999. Shrinking forest shrinks skink: morphological change in response to rainforest fragmentation in the prickly forest skink (*Gnypetoscincus queenslandiae*). *Biological Conservation* 91:159-167.

VCAT (Victorian Civil and Administrative Tribunal). 2015. *Hoser v Department of Environment Land Water and Planning* (Review and Regulation) [2015] VCAT 1147 (30 July 2015).

Wells, R. W. and Wellington, C. R. 1983. A synopsis of the Class Reptilia in Australia. *Australian Journal of Herpetology* 1(3-4):73-129.

Wells, R. W. and Wellington, C. R. 1985. A classification of the Amphibia and Reptilia of Australia. *Australian Journal of Herpetology Supplementary Series* 1:1-61.

Wilson, S. and Swan, G. 2010. *A complete guide to reptiles of Australia*, 3rd ed. New Holland, Chatswood, NSW, Australia:558 pp.

Winter, J. W. 1984. Conservation studies of tropical rainforest possums. pp. 469-81 in Smith, A. P. and Hume, I. D. (eds.) *Possums and Gliders.* Aust. Mamm. Soc., Sydney, Australia.

CONFLICT OF INTEREST

The author has no known conflicts of interest in terms of this paper and conclusions within.

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A new subspecies of *Daraninagama robinsonii* (Boulenger, 1908) from the Cameron Highlands, Malaysia (Squamata: Sauria: Agamidae) and a critical review of a critical review.

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ABSTRACT

The species *Daraninagama robinsonii* (Boulenger, 1908), known before 2014 as *Gonocephalus robinsonii*, or more recently under the invalid generic name *Malayodracon* Denzer *et al*., 2015, has until now been treated as a single taxon (Hoser 2014b). However it has long been suspected that the western population is taxonomically distinct from the nominate form.

This paper formalizes that position by naming the new taxon *Daraninagama robinsonii cliveevatti subsp. nov.* on the basis of different morphology and an apparently disjunct distribution.

Also addressed is a series of highly defamatory lies and gross misrepresentations conducted in a very unscientific manner in a paper by Denzer *et al*. (2016). Presented in a form that breaches of all established rules of ethics and scientific methods, Denzer *et al*. (2016) is used as a pretext to justify existing and planned illegal acts of taxonomic vandalism by these authors and fellow members of the so-called Wüster gang.

The group seeks to act outside the rules of the ICZN and usurp the authority of the ICZN.

Alternatively they seek to hijack the ICZN in order to carry on their nefarious agenda of unscientific taxonomic and nomenclatural hegemony as stated in Rhodin *et al.* (2015).

Keywords: Taxonomy; Lizards; nomenclature; Hoser; Manthey; Denzer; Kaiser; Wüster; plagiarization; fraud; theft; illegal act; new genus; *Daraninagama*; 2014; synonym; *Malayodracon*; 2015; new subspecies; *cliveevatti*; PRINO; peer reviewed in name only; journals; ICZN; *International Code of Zoological Nomenclature*; taxonomic vandalism; priority; homonymy; name authority; data mining.

INTRODUCTION

Hoser (2014b) divided the Asian lizard family Draconinae into new and existing genera based on obvious phylogenetic relationships and morphology of species. Among the new genera erected was *Daraninagama* Hoser, 2014 to accommodate the divergent species *Gonocephalus robinsonii* Boulenger, 1908. The generic placement of the species into the new genus *Daraninagama* had a firm basis of evidence, including phylogenetic and morphological as cited in the paper of Hoser (2014b) and does not need to be repeated here, noting that Hoser (2014b) has been online since a month after publication and distribution is not constrained by any form of paywall.

While until now the genus *Daraninagama* has been treated as monotypic, the purpose of this paper is to formally name a western population as a new subspecies, as explained below.

That description also contains the most obvious morphological differences separating both forms.

In 2015, Denzer *et al.* published a paper largely rehashing the materials and sources cited by Hoser (2014b), and while ignoring the Hoser paper, they chose to engage in an act of taxonomic vandalism by remanufacturing this data as "new" and then illegally coining a new genus name "*Malayodracon*" for the same taxon. The *International Code of Zoological Nomenclature* (Ride *et al.* 1999), which is a legal document, expressly forbids the reckless coining of names for taxa that have already been properly named via the rules of homonymy and priority.

As the coined name "*Malayodracon*" is a junior synonym of the legally correct *Daraninagama* Hoser, 2014, "*Malayodracon*" should never be used, except for the purpose of wasting space in synonyms lists.

The same individuals (Denzer *et al.* 2016) have also been recently (2015) closely associated with members of the so-called Wüster gang in a campaign to dishonestly steal the works of others to illegally rename taxa in direct breach and contempt of the rules of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999).

They have detailed their plans in their manifesto known as Kaiser *et al.* (2013), but perhaps more appropriately known as and called "Wüster 2013", because Kaiser had earlier identified him as the lead author. The same evil plot is detailed in the documents Kaiser (2012a, 2012b, 2013, 2014a and 2014b) as well as Rhodin *et al.* (2015) and countless hate posts on sites as diverse as "Twitter", "Facebook" and many "Wikipedia" pages, which they protect with so-called robots to prevent people correcting the obvious lies contained on the pages, as would otherwise happen on "Wikipedia" pages.

AN OSTENSIBLY CRITICAL REVIEW THAT IS NOTHING MORE THAN A COLLECTION OF LIES TO JUSTIFY ETHICALLY REPUGNANT ACTIONS.

For Denzer *et al.* (2015) to attempt to justify their overt act of attempted theft of name authority, via their improper act of trying to overwrite the legal name *Daraninagama* with their illegally coined name *Malaydracon*, three of the four authors of Denzer *et al.* (2015) and another (Philipp Wagner), did with the stated assistance's of one Hinrich Kaiser, publish their justification in a so-called paper, known as Denzer *et al.* (2016).

It was titled "A critical review of Hoser's writings on draconinae, Amphibolurinae, *Laudakia* and Uromastycinae (Squamata: Agamidae)" and published in the ostensibly "peer reviewed" *Bonn Zoological Bulletin.*

The lead authors gave their institutional affiliation as being with the "Society for Southeast Asian Herpetology".

However the only evidence of any such entity on the internet as of July 2016 was the very paper I am dealing with here and three others by the same group of authors who similarly gave such address details.

There is no evidence of any functioning "Society for Southeast Asian Herpetology" in any accepted sense of the term "Society", (e.g. newletter, bulletin, journal, society meetings or the like) which coincidentally reflects the absence of evidence of credible peer review for the paper they published as well.

Their paper commenced as follows:

"Abstract. We analyzed four papers on agamid lizards by self-proclaimed Australian herpetologist Raymond Hoser with respect to the presentation of diagnostic characters as well as their taxonomic and nomenclatural merits. In most cases the taxonomic concepts were lifted from earlier phylogenetic publications and the diagnoses were copied from other authors.

Copied text in Hoser's diagnostic section within the analyzed papers amounts to a staggering 83% for Draconinae, 82% for Amphibolurinae, 77% for *Laudakia* and 78% for Uromastycinae, respectively. We found a number of plagiarized paragraphs, sometimes half a page long. Hoser hardly ever makes any effort to attribute statements to the original author and in some cases he even omitted to cite the relevant source. With respect to nomenclature, we found that Hoser proposed names that were preoccupied or unavailable, that a nomen oblitum was resurrected incorrectly, nomina nuda were produced, a type locality was restricted incorrectly and a questionable holotype was designated for a new species.

With respect to taxonomy, we found examples of wrong diagnoses, falsely attributed species, omission of taxa and a lack of understanding or misinterpretation of previously published taxonomic studies on agamid lizards. Furthermore relevant literature on taxonomy and nomenclature has been overlooked or disregarded.

Key words. Plagiarism, IZCN rules, nomina nuda, questionable type specimen designation, ambiguous diagnoses."

However a cross referencing of the specific claims made against the Hoser papers invariably found that all were wrong or unsupportable from the original sources; these being the four Hoser papers.

Many of the claims against the Hoser papers were also demonstrably false, or alternatively almost always misleading or out of context and the so-called method of determining amounts of text lifted from other papers was fundamentally flawed and therefore as represented was completely false and misleading and of absolutely no value whatsoever.

The alleged copying of text by percentages as alleged as analysed was merely confirmation of the diagnostic features of given taxa, which as a matter of course would not significantly change, no matter which author wrote about them; this simple observation confirming the apparant similarities between diagnoses between the Hoser papers and those that preceded them (which were all cited in the proper way!).

There are dozens of examples of false and misleading claims in the Denzer *et al.* (2016) paper, many of which are repeated at various points in the nearly 20,000 word diatribe.

It is clear that as with Kaiser *et al.* (2013) and incarnations before and since (already cited), that Denzer *et al.* (2016) have run with the mantra that a lie repeated often enough will eventually be believed by a majority of people.

The entire paper of Denzer *et al.* (2016) is replete with lies and misinformation, all easily shown as such by simple cross-reference with the complained about Hoser papers, so it is strictly speaking not even necessary for me to give credibility to the rant by systematically refuting each and every claim herein.

However I mention a few of these false and misleading statements here here to give an example of the unscientific claims made by the authors and the tenor of what they wrote.

At page 135 under the heading "Conflict of interest", they complained that they had not been consulted before I cited their works in my papers. The comment was both ridiculous and hypocritical. Firstly there is no legal or scientific requirement for a publishing scientist to contact the authors of papers they cite. In the case of deceased authors this would be impossible in any event! I also need not mention that the first I became aware of the Denzer *et al.* (2016) rant was when it was SPAM posted across "Facebook", "Twitter" and elsewhere on the internet and not because any of the authors had the decency to contact me or ask for my opinion of their demonstrably false claims, which is standard practice for authors who seek to publish adverse claims against others.

One of many claims of (alleged) plagiarisation by myself was written thus:

"The taxonomic basis for Hoser's proposals on *Laudakia* can be found in their entirety in Macey *et al.* (1998, 2000b, 2006). Most of Hoser's proposed classification additionally reflects nodes in the phylogeny published by Pyron *et al.* (2013).", leading to the claim I had plagiarized Pyron's work because I did not cite that paper.

The problem with this is that the *Laudakia* paper subject of the criticism was published on 30 June 2012 (Hoser 2012a) and receipted by Museums, *Zoological Record* and others at the time, whereas Pyron's paper was published on 29 April 2013, or nearly a year later!

Now unless I am able to engage in such things as reading someone's mind a year hence and from the far side of the planet, it would not have been possible for me to plagiarize the works of Pyron!

This glaring evidence is just one of many such examples as to why the journal that Denzer *et al.* (2016) was published in, namely the *Bonn Zoological Bulletin* is either not "peer reviewed" or otherwise "PRINO" (peer reviewed in name only) as defined by Hoser (2015e).

That my taxonomic proposals had a basis from earlier works is not a crime either. That is provided I had properly cited them and credited the relevant authors and their works. This was done, with the three papers Macey *et al.* (1998, 2000b, 2006) and others by the same authors cited in the text of the paper and at the end in full as per standard scientific procedure.

Denzer *et al.* (2016) wrote: "Plagiarism is generally defined as passing off ideas or text from other publications as one's own", which is something I agree with, but when one actually cross checks my papers with their own claims against them, each and every claim of plagiarisation fails!

Interestingly in their criticism of my Draconinae reclassification Denzer *et al.* (2016) at page 126 allege I cited too many sources!

Then there is the associated claim from the abstract of Denzer *et al.* (2016) and repeated throughout the rant "In most cases the taxonomic concepts were lifted from earlier phylogenetic publications and the diagnoses were copied from other authors.” Fact is that there is nothing wrong with either activity!

This is provided the original sources were properly acknowledged and cited, as was the case in each of the Hoser papers referred to by Denzer *et al.* (2016), namely Hoser (2012b, 2012b, 2013b, 2014a, 2014b, 2014c and 2015).

However in the roughly 20,000 word rant by Denzer *et al.* (2016), the authors failed to explicitly state the single obvious difference between the relevant Hoser papers and those earlier papers from where the Hoser papers had “lifted’ data. This was that the Hoser papers assigned valid names according to the *International Code of Zoological Nomenclature* to previously unnamed clades.

This has been standard practice in Zoology for years and in the case of the relevant earlier papers, the clear error of failing to name unnamed clades was picked up and corrected in the Hoser papers!

Rhodin *et al.* (2015) made a similar complaint that I has been able to publish my papers and resulting descriptions of new taxa by the scientific method they called “data mining”, which I note is not illegal and in the context alleged, eminently sensible!

Now in terms of any theft claims, the *International Code of Zoological Nomenclature* makes it clear what is deemed ethical and what is not. The time limit of a year is set on authors seeking to monopolize given taxa for making themselves “name authority” in terms of publishing a formal code-compliant description.

As Denzer *et al.* (2016), alleged in terms of the Hoser *Laudakia* paper, they said the data that formed the basis of the phylogenetic arrangement “can be found in their entirety in Macey *et al.* (1998, 2000b, 2006).”

The last of this trio pre-dates the Hoser paper by no less than 6 years meaning that any alleged “right to name” the relevant generic groups by these authors expired five years earlier!

In other words, far from stealing the work of others, Hoser (2012a) has ethically and properly corrected a series of mistakes made in earlier papers, these being assigning one or more names to unnamed clades.

Denzer *et al.* (2016) is replete with statements that assume fact and are instead simply false or derogatory, examples of which include the following:

1/ Use of the term “self-proclaimed Australian herpetologist Raymond Hoser” is derogatory and lacks explanation. However the claim I am a ““self-proclaimed Australian herpetologist” has been refuted by no less than ten Victorian Judges in legal proceedings spanning the past decade, including for example the three judges who in 2014, found I was by measurable criteria, easily Australia’s leading reptile expert (Court of Appeal, 2014); or the same result in VCAT (2015), the relevant judgements of which are widely published on Australian government websites.

It is significant that in both cases, evidence from some or all of Wüster (2001), Kaiser *et al.* (2013) and Zug (2014) was rejected by the courts as rants from unscientific men whose agenda was to unlawfully steal the benefits of the work and intellectual property (IP) of others. This was via trying to steal the “name authority” for taxa not owned by them that had been correctly obtained via the rules of the *International Code of Zoological Nomenclature.*

It is also significant that Denzer *et al.* (2016) in their paper said “We are grateful to George Zug and Hinrich Kaiser for a prereview of the manuscript and for their comments, corrections and suggestions.”, noting that both Zug and Kaiser’s writings, namely Kaiser *et al.* (2013) and Zug (2014) had been formally rejected as unscientific rants by a Judge at VCAT a year earlier (VCAT 2015).

2/ In their paper, Denzer *et al.* (2016) told numerous lies that they simply hoped that their readers would never investigate or find out. One such example is this: They wrote:

“Hoser (2013) on Amphibolurinae

We note that the manuscript on Amphibolurinae was received by *AJH* on 20 July 2013, accepted for publication on 4 October 2013, and published on 20 October 2013. However, a tax invoice printed at the end of the publication (p. 36) states that the journal was printed on 3 October 2013, implying printed copies may have existed before the paper was accepted.”

The intent of the statement is to show that the entire publication process of *AJH* is fraudulent and that the editor (myself/ Raymond Hoser) has engaged in fraud. After all, how can a paper be accepted for publication after a publication date?

Now if one were to accept the claim as written and on face value and without taking the time to go to the relevant issue of *AJH* to check the claim, it would have to be accepted by the ill-informed reader as being true!

This belief would irreparably damage the reputation of myself (Raymond Hoser).

Clearly any peer reviewers or editors of this paper by Denzer *et al.* (2016) did not bother to check the original source, or if they did, they chose to recklessly ignore what they found, seeking the claim to cause maximum damage.

This is because if one goes to the source publication, namely the relevant issue of *AJH* (issue 21) one finds that the tax invoice published on p.36 carries an invoice date, but does not carry any date of publication or printing whatsoever.

Put simply, Denzer *et al.* (2016) have lied in claiming that the tax invoice on p.36 of Hoser (2013b) carried a date of printing or publication. It did not!

Hence their entire paragraph is yet another deliberate and scandalous lie by the authors.

To make things worse, the authors have continued this vein of dishonesty throughout their paper in at least three other widely spread places.

Elsewhere they wrote:

“A) Hoser (2014b) on draconinae.

As printed in the header of the paper, the Draconinae manuscript was received by the journal on 10 November 2013, accepted on 1 June 2014 and published on 1 July 2014.

According to the tax invoice, Issue 22 of the *AJH*, which includes the Draconinae paper, appears to have been planned before October 2013, which is the date of the invoice (Hoser 2013: 36, Hoser 2014a: 5; invoice date 3 October 2013, several weeks before the publisher initially received the manuscript). This could indicate that Hoser pays in advance for the printing of issues, which would imply that manuscripts may already be in hand, or that some of the publication dates are otherwise manipulated.”

Speculating what an invoice date “could indicate” in terms of attempting to create some kind of dishonest or criminal conspiracy on my part by Denzer *et al.* (2016) gets into the realm of of the wildest conspiracy theories.

Who knows, next Denzer *et al.* may allege that my trip to the United States in 1993 was a preliminary excursion to plan the destruction of the World Trade Centre buildings 11 September 2011?

Their evidence could be that I arrived in the USA by plane and this was the weapon of choice used to destroy the relevant structures.

Of course, the date of the tax invoices as published in *AJH* indicate exactly what it says and nothing more. This is that date of issuing of the invoices for payment to the printing house for publishing of the journals. As for any connection between the issue date of the invoices, payment dates, for which Denzer *et al.* (2016) clearly do not have a clue, or the ultimate printing/ publication dates, all their speculation is purely that ... speculation. If one looks at the invoices in every issue of *AJH*, the only common thread is that they are issued before the journals are published, as one would expect!

Like most businesses, printers like to be paid and preferably before they spend their own time and money doing the work!

Speaking of wild conspiracy theories, it is hard to go past the one by Denzer *et al.* (2016) at page 123 that alleges I hacked into a computer owned by the Pakistani government to steal the work of one of his gang members.

Now if I had such skills at computer hacking, I am sure that the American CIA would have recruited me to help them find Osama Bin Laden who managed to hide in Pakistan from them for a full ten years!

But the purpose of this paper is not to give a long-winded rebuttal of the false claims of Denzer *et al.* (2016).

As mentioned already, the authors rebadged the same lies more than once throughout the paper, in some kind of rotating fashion, in order to pad it out to be a nearly 20,000 word diatribe.

However the preceding is to note that they represent yet more of the lies and falsehoods of the Wüster gang as a pretext to their illegal act of stealing the works and name authorities of other authors who have properly named valid taxa before they lurched onto the scene and decided to look at the same animals critically.

Their intent to steal "name authority" for valid taxa is the entire basis of their collection of lies.

These people and their regular collections of lies and hatred have been discredited many times before (e.g. Cogger 2013, 2014a, 2014b; Court of Appeal Victoria 2012, 2014; Dubois 2014; Eipper 2013; Hoser 2012b, 2013b, 2015a-f; Mutton 2014a, 2014b; Shea 2013a-d, 2014a-b; Thorpe 2013, 2014a-c, 2015; Wellington 2013, 2014a-b, 2015 and Wells 2013, 2014a-b) and history will judge them appropriately.

However as they have published on the genus in question subject to the taxonomic act in this paper and sought to illegally rename the genus, it is appropriate that mention be made of the relevant papers, Denzer *et al.* (2015) and Denzer *et al.* (2016).

Put simply, the correct name for the genus is *Daraninagama* and not the junior synonym *Malayodracon*!

No amount of lies by Denzer *et al.* or others in the Wüster gang will change this fact!

Now in fairness to Denzer *et al.* (2016), I should mention that in the nearly 20,000 word diatribe, the only correct claim against the Hoser papers was the inadvertent use of a pre-occupied name for a genus of Agamids in one of the papers, that name being *Tiaris* Duméril and Bibron, 1837. That however had no imact whatsoever on the taxonomy in the papers or the logical (legal) nomenclatural acts that followed as published within the papers.

They all remain untarnished in any way and on the basis of available evidence, still remain correct!

A QUESTION OF ETHICS IN THE PUBLISHING PROCESS

Among the more scandalous claims by Denzer *et al.* (2016) is that I had somehow stolen the work of their gang (by hacking the Pakistani government computer) and scooped them by publishing my *Laudakia* paper just days before theirs (known as Baig *et al.* 2012). They wrote:

"Baig *et al.* (2012) was published in print on 18 July 2012 and Hoser (2012a) was published in print 30 June 2012. Both papers were accepted for publication by the respective journals in April 2012. We also note that Baig *et al.* (2012) was made available in advance online on the publisher's website on 6 July 2012, appearing a week after Hoser's publication."

However a simple check finds that it would appear that the claim "Baig *et al.* (2012) was published in print on 18 July 2012" and that I had fortuitously scooped their name authority by merely a few days, is pure fantasy.

A check with *Zoological Record* online (and archived) shows that the Hoser Journal posted from Australia with the relevant paper, arrived in the UK office of *Zoological Record* and was receipted on 9 July 2012.

That equates with a fortnight to get there, which sits in line with actual printing being a few days prior to the cover date.

This is significant noting the ethical considerations involved with the rules of the *International Code of Zoological Nomenclature* and the specific rule of priority, in that to backdate a publication date in order to try to wrongly assert name priority is both illegal and very unethical.

However we find that according to *Zoological Record* their first copy of Baig *et al.* did not arrive at their UK office until 29 November 2012.

In other words, far from being published on 18 July 2012 as alleged by Denzer *et al.*, it appears that their own paper did not actually get published until five months after the Hoser paper.

For them, it was definitely not a case of just missing out on claiming "name authority" by a few days!

Evidence therefore shows that either authors, journal publishers or both have been guilty of the morally repugnant act of illegally backdating their publication dates!

WHEN THE OPPORTUNITY TO STEAL AND GET AWAY WITH IT BECOMES A REASON TO DISCARD MORALS AND THE RULES

One of the coauthors of Denzer *et al.* (2015 and 2016) is none other than Wolfgang Böhme. Until approached by the Wüster gang preceding the publication of Denzer *et al.* (2015), which accepted the call to arms by Kaiser *et al.* (2013) to step outside the rules of the *International Code of Zoological Nomenclature*, and steal name authority from others, Böhme sat on the side of ethics and against taxonomic vandalism.

In 1998, he successfully argued to the ICZN against allowing any taxonomic vandalism to be used to attack the rules of the *International Code of Zoological Nomenclature* to allow thieves to steal name authority for species or genera from earlier authors.

The case in question involved another member of the Wüster gang, namely Robert George Sprackland, who sought to steal "name authority" from Richard Wells and Ross Wellington for a Monitor species they had named as "*Odatria keithhornei*" in 1985.

An attempt to suppress the name by Richard Shine and other members of the Wüster gang (The president, Australian Society of Herpetologists. 1987) failed in 1991 (ICZN 1991) with all but one commissioner voting against the thieves.

The related case argued by Böhme in 1998 arose when Sprackland improperly sought to illegally rename the species after his wife! (Böhme and Ziegler 1998).

The arguments advanced by Böhme and Ziegler (1998), agreed by the ICZN again by near unanimous vote shortly thereafter (ICZN 2001) remain unchanged and are a direct rebuttal of the stated central aims of Denzer *et al.* (2016) from the mouth of one of the four co-authors!

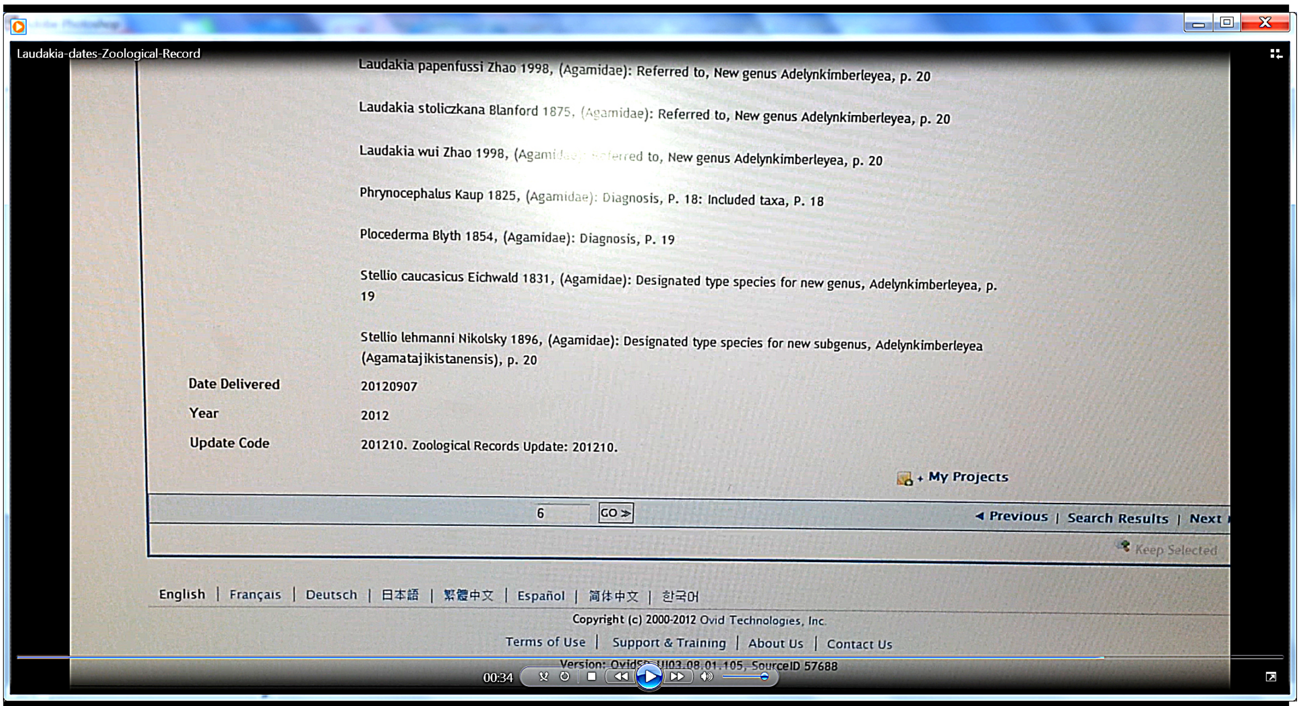
Notwithstanding this, the more recent published submission to the ICZN by Rhodin *et al.* (2015), confirms that the gang seek nothing less than to impose their own illegal hegemony on herpetological science, taxonomy and nomenclature and that they are also aggressively attempting to hijack the ICZN Commissioners themselves to carry on their own nefarious agenda.

If they succeed, taxonomy and nomenclature would descend into chaos, all for the purpose of affording the Wüster gang the self flaggelation of being able to claim to have "discovered" new taxa.

Of course part of this would be their improper attempts to rewrite the history of zoological discovery in a manner no different to the way Nazis and other dictators have sought to glorify themselves in the history books they have published.

A "THANK YOU!" TO DENZER *ET AL.* (2016)

Denzer *et al.* (2016) was undeniably written to attack myself (Hoser), my publications and cause maximum damage to myself



Laudakia papenfussi Zhao 1998, (Agamidae): Referred to, New genus Adelynkimberleyea, p. 20

Laudakia stoliczkana Blanford 1875, (Agamidae): Referred to, New genus Adelynkimberleyea, p. 20

Laudakia wui Zhao 1998, (Agamidae): Referred to, New genus Adelynkimberleyea, p. 20

Phrynocephalus Kaup 1825, (Agamidae): Diagnosis, P. 18: Included taxa, P. 18

Plocederma Blyth 1854, (Agamidae): Diagnosis, P. 19

Stellio caucasicus Eichwald 1831, (Agamidae): Designated type species for new genus, Adelynkimberleyea, p. 19

Stellio lehmanni Nikolsky 1896, (Agamidae): Designated type species for new subgenus, Adelynkimberleyea (Agamatajikistanensis), p. 20

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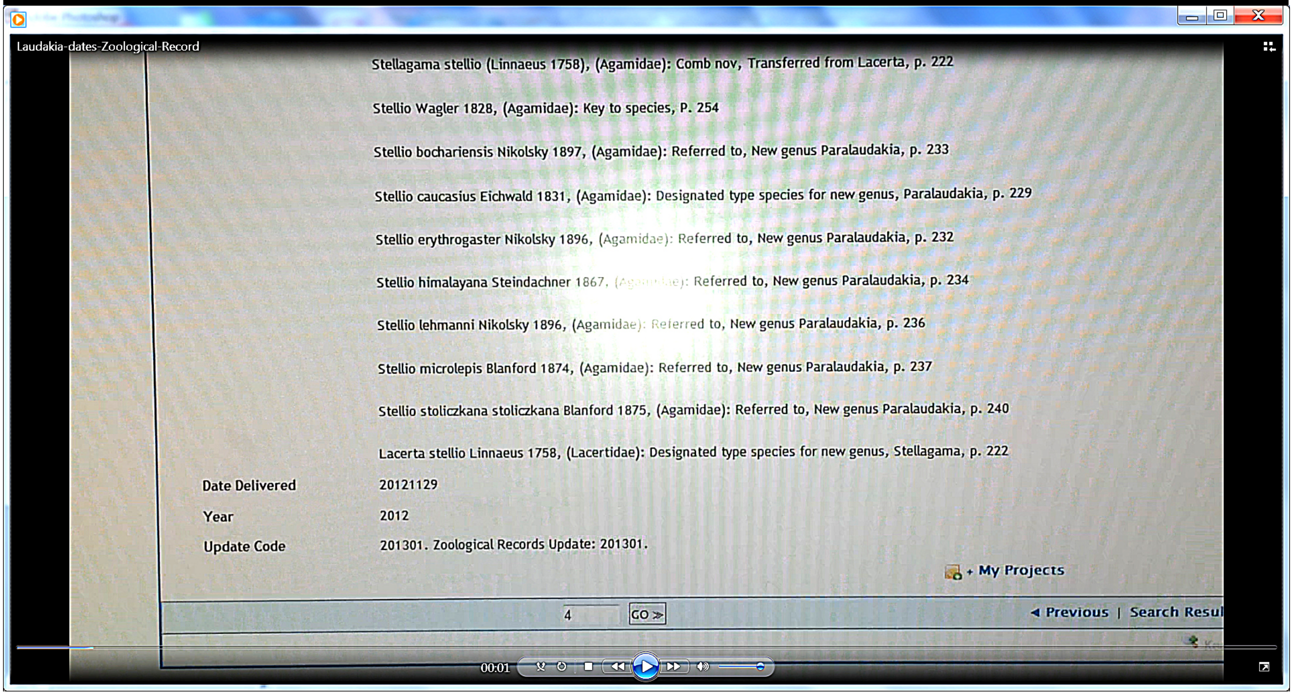
No, they didn't get scooped for a "name authority" by just few days as falsely alleged by Denzer *et al.* (2016). The independent evidence suggests that Baig *et al.* (2012) was in fact published some four and a half months after Hoser (2012). Shown here are screen dumps photographed from the *Zoological Record* website in 2013 that show a delivery receipt date of 9 July 2012 for the Hoser paper and 29 November 2012 for the Baig *et al.* paper.



Stellagama stellio (Linnaeus 1758), (Agamidae): Comb nov, Transferred from Lacerta, p. 222

Stellio Wagler 1828, (Agamidae): Key to species, P. 254

Stellio bochariensis Nikolsky 1897, (Agamidae): Referred to, New genus Paralaudakia, p. 233

Stellio caucasius Eichwald 1831, (Agamidae): Designated type species for new genus, Paralaudakia, p. 229

Stellio erythrogaster Nikolsky 1896, (Agamidae): Referred to, New genus Paralaudakia, p. 232

Stellio himalayana Steindachner 1867, (Agamidae): Referred to, New genus Paralaudakia, p. 234

Stellio lehmanni Nikolsky 1896, (Agamidae): Referred to, New genus Paralaudakia, p. 236

Stellio microlepis Blanford 1874, (Agamidae): Referred to, New genus Paralaudakia, p. 237

Stellio stoliczkana stoliczkana Blanford 1875, (Agamidae): Referred to, New genus Paralaudakia, p. 240

Lacerta stellio Linnaeus 1758, (Lacertidae): Designated type species for new genus, Stellagama, p. 222

Date Delivered 20121129
Year 2012
Update Code 201301. Zoological Records Update: 201301.

(as a pretext to the planned theft of my hard earned intellectual property, in the form of "name authority" for taxa). Denzer *et al.* (2016) continue that outdated white Eurocentric view of entitlement to steal from people elsewhere on the planet via the fabrication of false claims and in breach of all accepted rules and protocols. They must not be allowed to impose the Wüster gang's ISIS-like mob-rule on the scientific community.

However the attack by Denzer *et al.* (2016) not only failed to refute the taxonomy and nomenclature of the papers in question (which is really all that matters), but they noted that I was correct in most cases, because they alleged I had stolen other people's research work, including for example in the *Laudakia* paper.

By running the central theme that all the contents of the Hoser papers was derived from stealing the evidence and works of earlier authors (the main plagiarisation claim), or what Rhodin *et al.* (2015) called my "data mining", these authors have in effect refuted the central claims of the Wüster gang made over most of the period from 1998 to 2012 (e.g. Wüster 2001 and Wüster *et al.* 2001). This was that the taxonomy of myself was ridiculous and "evidence free" and should therefore be rejected and not used on that basis.

Now that Denzer *et al.* (2016) in addition to Rhodin *et al.* (2015) have shown that the Hoser papers do have a sound scientific basis (even if they make the fanciful claim it was all stolen from hacked government computers and the like), the acceptance and use of the taxonomic concepts within these papers and the legal nomenclature arising should be a mere formality.

Therefore, I would like to publicly thank Denzer *et al.* (2016) for laying out the evidentiary basis for the relevant papers, the taxonomy within and therefore await the rest of the Wüster gang to comply with the rules of the *International Code of Zoological Nomenclature* to use the relevant names.

SUBSPECIES OF *DARANINAGAMA ROBINSONII*

The species *Daraninagama robinsonii* (Boulenger, 1908) has until now been treated as a single species with a disjunct range across the highlands of Peninsula Malaysia.

Data obtained by myself on this and other species from across south-east Asia, accumulated over some decades was stolen from my facility in an illegal armed raid by government officers on 17 August 2011.

It is significant that in the years prior to this illegal shut-down of our successful conservation, education and research business, Wüster *et al.* had run an illegal online petition calling for the government of Australia to illegally shut down our business. Thdeir petition was posted online on a wesbite controlled by known criminal Shane Hunter (Hunter *et al.* 2006).

In contempt of court orders to return the materials taken at gunpoint on 17 August 2011, the relevant material was either not returned or if on disks, degraded so as to be unretrievable and effectively lost.

This adversely impacted the imminent publications on numerous reptiles including nominate *Daraninagama robinsonii.* However noting the ongoing conservation risks to all populations of *Daraninagama robinsonii* due to habitat destruction, introduced pests, infectious diseases and/or parasites and other factors, I view it as important that the currently unnamed subspecies taxon be named sooner rather than later. This is because "later" may be at a time before governments recognize this potential management unit and otherwise let it expire.

In terms of the two main populations of the species, Denzer *et al.* (2015) wrote:

"Variation. Hitherto known specimens from the type locality (Gunung Tahan) do not show enlarged dorsal scales arranged in oblique rows (Boulenger 1908, Sly 1976) as it can be seen in specimens from the Cameron Highland region. It is conceivable that these two populations have been separated for a long time and constitute subspecies. However, in order to establish consistency of this character more material from the remote mountain ranges of central Malaysia is needed. Additionally there exists a photographic record of a specimen from the Cameron Highlands without apparent enlarged scales across the dorsum rendering the above observation doubtful."

From this paragraph it is clear that like myself these authors have viewed the potentiality that the two known populations are taxonomically distinct, but their comments with respect to the "enlarged dorsal scales arranged in oblique rows" is evidently wrong.

The holotype specimen as depicted in their paper does in fact posess such "enlarged dorsal scales arranged in oblique rows", as does the specimen of the western form as depicted in the same paper. Hence absence or presence of such rows is not in itself a means to differentiate populations.

However what is significant is that these rows are obvious in the western specimens and relatively indistinct (but still present) in the type form, giving one means to separate the two.

Inspection of specimens from each area also shows other subtle differences as outlined in the formal description of the subspecies below.

Diagnosis of *D. robinsonii* (Boulenger, 1980) can be found in both Hoser (2014) and Denzer *et al.* (2015) as well as some of the sources cited therein and is therefore not repeated here.

DARANINAGAMA ROBINSONII CLIVEEVATTI SUBSP. NOV.

Holotype: A preserved specimen at the The University of Texas at Austin, (Texas Natural History Collections), USA, specimen number: TNHC Herpetology 56648, collected from the Cameron Highlands, Pahang, (Peninsula) Malaysia. This facility allows access to its holdings.

Paratype: A preserved specimen at the The University of Texas at Austin, (Texas Natural History Collections), USA, specimen number: TNHC Herpetology 57717, collected from the Cameron Highlands, Pahang, (Peninsula) Malaysia.

Diagnosis: *Daraninagama robinsonii cliveevatti subsp. nov.* are separated from *D. robinsonii robinsonii* by the presence of enlarged dorsal scales arranged in oblique rows, versus the presence of indistinct enlarged dorsal scales arranged in oblique rows. Behind and below the eye and before the ear there is a series of enlarged white scales with black at the borders. In *D. robinsonii cliveevatti subsp. nov.* the black is thickened, whereas this is not the case in *D. robinsoni robinsonii.*

In *D. robinsonii robinsonii* the upper part of the nasal darkens, which is not the case in *D. robinsonii cliveevatti subsp. nov..*

Diagnostic information for the species *Daraninagama robinsonii* (Boulenger, 1908), including both species can be found in Hoser (2014) and Denzer *et al.* (2015).

Distribution: Known only from the general area of the Cameron Highlands, West Malaysia.

Etymology: Named in honour of barrister Clive Andreas Evatt from Turramurra, North Shore of Sydney, NSW, Australia. Unlike most lawyers who do nothing more than lie, cheat and thieve, Clive is a man of ethics and honour. He has taken on a number of important public interest cases at huge personal cost that otherwise may not have been litigated.

Over many decades he has as a defamation lawyer successfully defended weak and vulnerable individuals from powerful interests in the media and government who have either sought to suppress the truth or do so by unlawfully slandering whistleblowers to destroy their previously good reputations.

Of particular relevance to private reptile keepers and herpetologists everywhere is that in 1996 Evatt and fellow lawyer, Michael Rollinson successfully fought the NSW National Parks and Wildlife Service (NPWS) and allies in three cases in the NSW Supreme Court to ban the newly published book, *Smuggled-2: Wildlife Trafficking, Crime and Corruption in Australia* (Hoser 1996).

False claims (similar to those of Denzer *et al.* 2016 against Hoser papers) were made against the Hoser book.

Evatt systematically refuted each and every one of these false claims and went further and showed that it was the accusers who were guilty of the very misconduct they were alleging (as is the case with Denzer *et al.* 2016).

As a result of the work of Evatt and Rollinson in making sure the public got to read the truth about the wildlife trade in Australia, the attempts to ban the book failed.

The last case was finalized on 24 December that year and widely reported in the media at the time.

As a result of the publicity and the fact that the book was now legally being sold Australia-wide, the book became a best-seller. As a direct result of the publication of the book, governments across Australia were then forced to remove more than 20 year-old bans on legal private ownership of reptiles, which came to fruition the following year (1997) in NSW and shortly thereafter elsewhere.

Some states in Australia had lifted bans on private ownership of reptiles following publication of the book *Smuggled: The Underground Trade in Australia's Wildlife* (Hoser, 1993), which was also initially banned by the NSW Government who illegally got police across Australia to sieze copies from booksellers.

The 1993 ban was lifted following a major campaign by the tabloid media at the time (Hoser 1996).

A court action to ban that book also failed and the publisher Charles Pierson ultimately secured a sizeable payout arising from the illegal actions to enforce the ban in 1993.

REFERENCES CITED

Baig, K. J., Wagner, P., Ananjeva, N. B. and Böhme, W. 2012. A morphology-based taxonomic revision of *Laudakia* Gray, 1845 (Squamata: Agamidae). *Vertebrate Zoology* 62: 213-260.

Böhme, W. and Ziegler, T. 1988. Comments on the proposed specific name of *Varanus teriae* Sprackland, 1991 (Reptilia, Squamata). *Bulletin of Zoological Nomenclature* 55(2):111-113.

Cogger, H. G. 2013. Email to Raymond Hoser, 17 August 2013.

Cogger, H. G. 2014a. *Reptiles and Amphibians of Australia*, Seventh Edition, CSIRO Publishing, Sydney, NSW, Australia:xxx+1033 pp.

Cogger, H. G. 2014b. Email to Raymond Hoser, 5 July.

Court of Appeal Victoria. 2012. Transcript and Judgement, Raymond Hoser versus the Department of Sustainability and Environment, Victoria. (8 June).

Court of Appeal Victoria. 2014. Hoser v Department of Sustainability and Environment [2014] VSCA 206 (5 Sept. 2014).

Denzer, W., Manthey, U., Mahlow, K. and Böhme, W. 2015. The systematic status of *Gonocephalus robinsonii* Boulenger, 1908 (Squamata: Agamidae: Draconinae). *Zootaxa* 4039(1):129-144.

Denzer, W., Manthey, U., Wagner, P. and Böhme, W. 2016. A critical review of Hoser's writings on Draconinae, Amphibolurinae, *Laudakia* and Uromastycinae (Squamata: Agamidae). *Bonn Zoological Bulletin* 64(2):117-138.

Dubois, A. 2014. Email to Raymond Hoser, 14 May.

Eipper, S. 2013. Post on Facebook, 16 December.

Hoser, R. T. 1993. *Smuggled: The Underground Trade in Australia's Wildlife*. Apollo Books, Moss Vale, NSW, Australia:160 pp.

Hoser, R. T. 1996. *Smuggled-2: Wildlife trafficking, crime and corruption in Australia.* Kotabi Publishing, Doncaster, Victoria, Australia:280 pp.

Hoser, R. T. 2012a. A five-way division of the agamid genus *Laudakia* Gray, 1845 (Squamata: Sauria: Agamidae). *Australasian Journal of Herpetology* 14:17-23.

Hoser, R. T. 2012b. Robust taxonomy and nomenclature based on good science escapes harsh fact-based criticism, but remains unable to escape an attack of lies and deception. *Australasian Journal of Herpetology* 14:37-64.

Hoser, R. T. 2013a. The science of herpetology is built on evidence, ethics, quality publications and strict compliance with the rules of nomenclature. *Australasian Journal of Herpetology* 18:2-79.

Hoser, R. T. 2013b. A seven way division of the Amphibolurinae (Squamata: Sauria: Agamidae). *Australasian Journal of Herpetology* 21:33-36.

Hoser, R. T. 2014a. A break up of the genus *Acrochordus* Hornstedt, 1787, into two tribes, three genera and the description of two new species (Serpentes: Acrochordidae). *Australasian Journal of Herpetology* 22:2-8.

Hoser, R. T. 2014b. A logical new taxonomy for the Asian subfamily Draconinae based on obvious phylogenetic relationships and morphology of species (Squamata: Sauria: Agamidae: Draconinae). *Australasian Journal of Herpetology* 22:9-59.

Hoser, R. T. 2014c. A long overdue taxonomic rearrangement of the Uromastycinae (Squamata: Sauria: Agamidae). *Australasian Journal of Herpetology* 23:54-64.

Hoser, R. T. 2015a. Dealing with the "truth haters" ... a summary! Introduction to Issues 25 and 26 of *Australasian Journal of Herpetology*. Including "A timeline of relevant key publishing and other events relevant to Wolfgang Wüster and his gang of thieves." and a "Synonyms list". *Australasian Journal of Herpetology* 25:3-13.

Hoser, R. T. 2015b. The Wüster gang and their proposed "Taxon Filter": How they are knowingly publishing false information, recklessly engaging in taxonomic vandalism and directly attacking the rules and stability of zoological nomenclature. *Australasian Journal of Herpetology* 25:14-38.

Hoser, R. T. 2015c. Best Practices in herpetology: Hinrich Kaiser's claims are unsubstantiated. *Australasian Journal of Herpetology* 25:39-52.

Hoser, R. T, 2015d. Comments on *Spracklandus* Hoser, 2009 (Reptilia, Serpentes, ELAPIDAE): request for confirmation of the availability of the generic name and for the nomenclatural validation of the journal in which it was published (Case 3601; see *BZN* 70: 234-237; comments *BZN* 71:30-38, 133-135). (unedited version) *Australasian Journal of Herpetology* 27:37-42.

Hoser, R. T. 2015e. PRINO (Peer reviewed in name only) journals: When quality control in scientific publication fails. *Australasian Journal of Herpetology* 26:3-64.

Hoser, R. T. 2015f. Rhodin *et al.* 2015, Yet more lies, misrepresentations and falsehoods by a band of thieves intent on stealing credit for the scientific works of others. *Australasian Journal of Herpetology* 27:3-36.

Hunter, S. *et al.* 2006. Online petition to shut down Raymond Hoser, published at: http://www.aussiereptileclassifieds.com/phpPETITION

ICZN. 1991. Case 2531, Decision of the Commission: Three works by Richard W. Wells and C. Ross Wellington: proposed suppression for nomenclatural purposes. *Bulletin of Zoological Nomenclature* 48(4):337-338.

ICZN. 2001. Opinion 1970 *Odatria keithhornei* Wells & Wellington, 1985 (Reptilia, Squamata): specific name placed on the Official List. *Bulletin of Zoological Nomenclature* 58(1):74.

Kaiser, H. 2012a. SPAM email sent out to numerous recipients on 5 June 2012.

Kaiser, H. 2012b. (or Kaiser *et al.* 2012). Point of view. Hate article sent as attachment with SPAM email sent out on 5 June 2012.

Kaiser, H. 2013. The Taxon Filter, a novel mechanism designed to facilitate the relationship between taxonomy and nomenclature, vis-à-vis the utility of the Code's Article 81 (the Commission's plenary power). *Bulletin of Zoological Nomenclature* 70(4) December 2013:293-302.

Kaiser, H. 2014a. Comments on *Spracklandus* Hoser, 2009 (Reptilia, Serpentes, ELAPIDAE): request for confirmation of the availability of the generic name and for the nomenclatural validation of the journal in which it was published. *Bulletin of Zoological Nomenclature* 71(1):30-35.

Kaiser H. 2014b. Best Practices in Herpetological Taxonomy: Errata and Addenda. *Herpetological Review*, 45(2):257-268.

Kaiser, H., Crother, B. L., Kelly, C. M. R., Luiselli, L., O'Shea, M., Ota, H., Passos, P., Schleip, W. D. and Wüster, W. 2013. Best practices: In the 21st Century, Taxonomic Decisions in Herpetology are Acceptable Only When supported by a body of Evidence and Published via Peer-Review. *Herpetological Review* 44(1):8-23.

Mutton, N. 2014a. Private email (via Facebook) to Raymond Hoser. 6.31 AM, 30 May.

Mutton, N. 2014b. Two emails to Raymond Hoser, 9 June.

Pyron, R. A., Burbrink, F. T. and Wiens, J. J. 2013. A phylogeny and revised classification of Squamata, including 4161 species of lizards and snakes. *BMC Evolutionary Biology* 13:93.

Ride, W. D. L. (*ed.*) *et al.* (on behalf of the International Commission on Zoological Nomenclature) 1999. *International code of Zoological Nomenclature* (Fourth edition). The Natural History Museum - Cromwell Road, London SW7 5BD, UK.

Rhodin, A. *et al.* 2015. Comment on *Spracklandus* Hoser, 2009 (Reptilia, Serpentes, ELAPIDAE): request for confirmation of the availability of the generic name and for the nomenclatural validation of the journal in which it was published (Case 3601; see *BZN* 70: 234-237; 71: 30-38, 133-135, 181-182, 252-253). *Bulletin of Zoological Nomenclature* 72(1)65-78.

Shea, G. 2013a. Email to Raymond Hoser dated Fri, 8 Mar 2013 04:29:39 +0000.

Shea, G. 2013b. Post on facebook at: http://www.facebook.com/glenn.shea.73?ref=ts&fref=ts on 8 March at 7.51 AM.

Shea, G. 2013c. Post on facebook on 20 March at:http://www.facebook.com/glenn.shea.73?ref=ts&fref=ts#!/bryangrieg.fry?fref=ts

Shea, G. 2013d. Post on facebook on 20 March at:http://www.facebook.com/glenn.shea.73?ref=ts&fref=ts#!/bryangrieg.fry?fref=ts

Shea, G. 2014a. Goodbye Niveoscincus and Hello Carinascincus...Cogger (2014). Facebook post on wall of Richard Wells, 7 March.

Shea, G. 2014b. Email to Raymond Hoser, 5 July.

The president, Australian Society of Herpetologists. 1987. Three works by Richard W. Wells and C. Ross Wellington: proposed suppression for nomenclatural purposes. *Bulletin of Zoological Nomenclature* 46(2):116-122.

Thorpe, S. 2013. Post to the Taxacom listserver, 21 May.

Thorpe, S. 2014a. Post to the Taxacom listserver, 13 April.

Thorpe, S. 2014b. Email to ICZN. 29 April.

Thorpe S. 2014c. Email to Doug Yanega and ICZN List. 6 July.

Thorpe, S. 2015. Post to the Taxacom list server, 30 April at 01:19.

Victorian Civil and Administrative Tribunal (VCAT). 2015. *Hoser v Department of Environment Land Water and Planning* (Review and Regulation) [2015] VCAT 1147 (30 July 2015).

Wellington, C. R. 2013. Post on Facebook, 26 December 2013.

Wellington, C. R. 2014a. Post on Facebook wall of Scott Eipper 6 April.

Wellington, C. R. 2014b. Email to ICZN List and others on 9 July 2014.

Wellington, C. R. 2015. Comment on the proposed confirmation of the availability of the generic name *Spracklandus* Hoser, 2009 (Reptilia, Serpentes, ELAPIDAE) and for the nomenclatural validation of the journal in which it was published (Case 3601; see *BZN* 70: 234-237; 71: 30-38, 133-135, 181-182, 252-253; 72: 61-78). *Bulletin of Zoological Nomenclature* 72(3):222-226.

Wells, R. W. 2013. Post on Facebook, 18 December.

Wells, R. W. 2014a. Post on Facebook wall of Scott Eipper, 6 April.

Wells, R. W. 2014b. Post on blogger.com on 7 July.

Wüster, W. 2001. Post on Kingsnake.com at: January 22, 2001 at 11:29:07 (same document as Wüster, W., Bush, B., Scott Keogh, J., O'Shea, M. and Shine, R. 2001. Cited below except Wüster was listed here as the sole author, indicating he had "shopped" the paper for "coauthors").

Wüster, W., Bush, B., Keogh, J. S., O'Shea, M. and Shine, R. 2001. Taxonomic contributions in the "amateur" literature: comments on recent descriptions of new genera and species by Raymond Hoser. *Litteratura Serpentium* 21:67-79, 86-91. (Previously published by Wüster in 2001 as sole author on www.kingsnake.com).

Zug, G. R. 2014. Comment on the proposed confirmation of the availability of *Spracklandus* Hoser, 2009 (Reptilia, Squamata, ELAPIDAE) (Case 3601; see *BZN* 70: 234-237). *Bulletin of Zoological Nomenclature* 71(4):252-253.

CONFLICT OF INTEREST

The author has no known conflicts of interest in terms of this paper and conclusions within other than as name authority for the legally correct nomen *Daraninagama* Hoser, 2012.

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A redefinition of the *Tiliqua* Gray, 1825 (*sensu lato*) group of lizards from the Australian bioregion including the erection of a new genus to accommodate a divergent species.

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ABSTRACT

The genus *Tiliqua* Gray, 1825 includes the iconic Australian Bluetongue Lizards (several species) and other large well-known livebearing skinks.

Cogger *et al.* (1983) treated the genus as including a broad swag of species including the so-called She-oak skinks, Shingleback and Pink-tongued Skink.

More recently and reflecting the position of most Australian herpetologists, Cogger (2014) restricted *Tiliqua* to include only the Blue-tongued Lizards and Stumpy Tailed Skinks, while resurrecting the genus *Cyclodomorphus* Fitzinger, 1843 to include the She-oak skinks and the Pink-tongued Skink.

Other authors, including Wells and Wellington (1985), have gone further than Cogger (2014) and resurrected the name *Hemisphaeriodon* Peters, 1867 for the Pink-tongued Skink, and *Trachydosaurus* Gray, 1825 for the Shinglebacks.

A recent phylogeny published (Pyron *et al.* 2013), not only supports the divisions by Wells and Wellington (1985), but further supports the division of *Cyclodomorphus* as currently recognized into two well-defined and distinct genera, which was done by Wells (2007) and derided as being without evidence by Kaiser *et al* (2013).

The correct name for that clade is *Zeusius* Wells, 2007 and it should be used, even if illegally over-written by another name coined by the so-called Wüster gang as urged by Kaiser *et al*. (2013).

The unique species, *T. adelaidensis* Peters, 1863, which has had varying positions in published phylogenies and yet is distinct from other species in significant ways is also herein placed in a new genus formally named for the first time.

This paper also defines all relevant genera within the *Tiliqua* group as defined by Cogger *et al*. (1983).

Keywords: Taxonomy; lizards; genus; *Tiliqua*; *Cyclodomorphus; Hemisphaeriodon; Trachydosaurus; Zeusius*; species; Shingleback; Stumpy tailed skink; Bluetongued skink; Pink tongued skink; She-oak skink; Slender bluetongue; Adelaide Bluetongue Lizard; Australia; Western Australia; South Australia; Northern Territory; Victoria; Tasmania; New South Wales; genera; new genus; *Lazarusus*.

INTRODUCTION

The genus *Tiliqua* Gray, 1825 includes the iconic Australian Bluetongue Lizards (several species) and other large well-known livebearing skinks.

Cogger *et al.* (1983) treated the genus as including a broad swag of species including the so-called She-oak skinks, Shingleback and Pink-tongued Skink.

More recently and reflecting the position of most Australian herpetologists, Cogger (2014) restricted *Tiliqua* to include only the Blue-tongued Lizards and Stumpy Tailed Skinks, while resurrecting the genus *Cyclodomorphus* Fitzinger, 1843 to include the She-oak skinks and the Pink-tongued Skink.

Other authors, including Wells and Wellington (1985), have gone further than Cogger (2014) and resurrected the name *Hemisphaeriodon* Peters, 1867 for the Pink-tongued Skink, and *Trachydosaurus* Gray, 1825 for the Shinglebacks.

Hoser (1989) relied on the consensus taxonomy and nomenclature of the time and placed the Shinglebacks in *Trachydosaurus*, but left all other species in *Tiliqua*, noting here that the book in question followed accepted taxonomy and did not as a rule make detailed taxonomic judgements.

A recent phylogeny published (Pyron *et al.* 2013), not only supports the divisions by Wells and Wellington, but further supports the division of *Cyclodomorphus* as currently recognized into two well-defined and distinct genera.

On its own the molecular data would be perhaps ignored, but it does in fact corroborate the very different morphologies of the two species groups, as outlined in Cogger (2014) or also in the review of the group by Shea and Miller in 1995.

The review by Shea and Miller (1995) not only comprehensively reviewed the past literature on these lizards (not necessarily re-cited here), but in effect gave a very solid morphological basis for splitting the genus as understood at the time and adopted by them.

Hence there is no sensible option other than to split the genus into two at the present time. This was done by Wells (2007) and derided as being without evidence by Kaiser *et al* (2013), a paper which is notable in that it defined itself by lacking evidence for the claims made within.

The correct name for that clade is *Zeusius* Wells, 2007.

The unique species, *T. adelaidensis* Peters, 1863, which has had varying positions in published phylogenies and yet is distinct from other species in significant ways is also herein placed in a new genus.

Numerous herpetologists have privately to myself suggested making this move to erect a new genus for this taxon, but for various reasons have never got around to it.

The molecular phylogeny published by Pyron *et al.* 2013 shows the species being most closely related to the Shinglebacks (*Trachydosaurus*) and based on the alleged divergence, could easily be placed in the same genus.

However these species are so radically different from one another both in form and habit, it seems untenable to continue to place each in the same genus.

Another issue to arise is that the species *T. adelaidensis* Peters, 1863 is clearly physically most like species of Bluetongues (*Tiliqua sensu-stricto*) as opposed to the very divergent Shinglebacks, thereby creating a quandary of whether to merge all together or to divide into three.

Adding to this is that Pyron *et al.* (2013) show *T. adelaidensis* Peters, 1863 and *Trachydosaurus* being more closely related to *Cyclodomorphus branchialis* Günther, 1867 than to the other Bluetongues (*Tiliqua sensu stricto*).

While one could argue that this gives an alternative view that all relevant species should be merged back into a single large *Tiliqua* as defined by Cogger *et al.* (1983), the depth of most divergences suggests that the generic splits should be maintained to retain effective parity in level of divisions across the Lygosominae.

Based on morphology, to place *T. adelaidensis* within *Trachydosaurus* is untenable, while to merge *T. adelaidensis* with *Cyclodomorphus* is similarly untenable, as is the concept of merging all back to *Tiliqua.*

It is similarly untenable to place *T. adelaidensis* in a subgenus of *Trachydosaurus* or for that matter the apparently more distant (according to Pyron *et al.* 2013) *Tiliqua.*

Faced with this quandary, the only sensible way to deal with the issue is to erect a new genus, (not subgenus for the reasons just explained) for the taxon, *T. adelaidenesis.* This paper does exactly that!

In order to define the new genera, it also makes sense to redefine extant recognized genera and list the recognized species within each.

This is done below.

Subspecies are ignored herein, even though some may subsequently be elevated to full species.

Material relevant to this paper and that would have greatly assisted in its preparation, was illegally stolen by wildlife officers in an illegal armed raid on 17 August 2011 (Court of Appeal, Victoria 2014, VCAT 2015). It was hoped this would be returned shortly after the raid, but as of this date (2016), the material has not yet been returned.

GENUS *TILIQUA* GRAY, 1825.

Type species: *Lacerta scincoides,* White, 1790.

Diagnosis: Herein restricted to the so-called Bluetongued skinks.

These large mainly diurnal, live-bearing lizards are separated from all other Australian skinks and defined as follows: Short pentadactyle limbs and short rounded tails ending in a point which is usually much shorter than the body. Dorsal scales are moderate and smooth. Head shields are smooth, symmetrical and unfragmented; subdigital lamellae are undivided. No supranasals or divided nasal scales. A scaly movable lower eyelid; parietal scales when distinct are not in contact behind the interparietal; third and fourth toes are either subequal or the third toe is slightly longer than the fourth.

Lazarusus gen. nov. is separated from the otherwise similar *Tiliqua* by the following suite of characters: Anterior temporal scales are more or less equal to others, being not much longer than broad; more than 32 mid-body rows; body without distinct cross bands; at most a single row of enlarged scales on the neck between the interparietal and the smaller body scales.

Distribution: Australia, including Tasmania, Papua New Guinea and nearby Indonesia, west to Halmahera and Ambon/Ceram.

Content: *Tiliqua sincoides* (White ex Shaw, 1790) (type species); *T. gigas* (Schneider, 1801) (including subspecies). *T. intermedia* Mitchell, 1955; *T. multifasciata* Sternfeld, 1919; *T. nigrolutea* (Quoy and Giamard, 1824); *T. occipitalis* (Peters, 1863).

GENUS *TRACHYDOSAURUS* GRAY, 1825.

Type species: *Trachydosaurus rugosus* Gray, 1825.

Diagnosis: Herein restricted to the so-called Shinglebacked skinks.

These large diurnal, live-bearing lizards are separated from all other Australian skinks and defined as follows: Short pentadactyle limbs and very short depressed blunt ended tail, with a body and tail characterised by grossly enlarged dorsal scales that are strongly but bluntly rugose. The head shields are fragmented with little symmetry and the subdigital lamellare are divided, at least basally.

No supranasals or divided nasal scales. A scaly movable lower eyelid; parietal scales when distinct are not in contact behind the interparietal; third and fourth toes are either subequal or the third toe is slightly longer than the fourth.

Distribution: Drier parts of southern Australia, south of the most arid parts of central and western Australia, extending north in the eastern states as far north as central Queensland and midway up the Western Australian coast.

Content: *Trachydosaurus rugosus* Gray, 1825 (including three recognized subspecies).

GENUS *CYCLODOMORPHUS* FITZINGER, 1843.

Type species: *Cyclodus casuarinae* Duméril and Bibron, 1839.

Diagnosis: A group of medium-sized lizards similar in many respects to Bluetongues (*Tiliqua*), but with slender heads, necks, bodies and a long-slender tail which is at least as long as the body if an original tail. Anterior ear lobules present ; scales smooth, subequal; no supranasals or divided nasal scales; a scaly movable lower eyelid; parietal scales not in contact behind the interparietal; third and fourth toes subequal or the third toe is slightly longer than the fourth; subdigital lamellae undivided. Separated from the similar *Zeusius* Wells, 2007 by the absence of a post narial groove.

Separated from *Hemisphaeriodon* Peters, 1867 by having two infralabial scales contacting the postmental scale on each side (versus one).

They may be diurnal, crepuscular or nocturnal.

Distribution: Tasmania and cooler parts of eastern Victoria, New South Wales (NSW) and the Australian Capital Territory (ACT).

Content: *Cyclodomorphus casuarinae* (Duméril and Bibron, 1839) (type species); *C. michaeli* Wells and Wellington, 1984; *C. praealtus* Shea, 1995.

GENUS *HEMISPHAERIODON* PETERS, 1867.

Type species: *Hinulia gerrardi* Gray, 1845.

Diagnosis: A group of medium-sized lizards similar in many respects to Bluetongues (*Tiliqua*), but with slender heads, necks, bodies and a long-slender tail which is at least as long as the body if an original tail. Anterior ear lobules present ; scales smooth, subequal; no supranasals or divided nasal scales; a scaly movable lower eyelid; parietal scales not in contact behind the interparietal; third and fourth toes subequal or the third toe is slightly longer than the fourth; subdigital lamellae undivided. Separated from the similar *Zeusius* Wells, 2007 by the absence of a post narial groove. Separated from *Cyclodomorphus* Fitzinger, 1843 by having one infralabial scale contacting the postmental scale on each side (versus two).

They may be diurnal, crepuscular or nocturnal.

Distribution: Coastal NSW, from west of Sydney, along the east coast of Australia to lower Cape York.

Content: *Hemisphaeriodon gerrardi* (Gray, 1845) (treated here as monotypic, which may be in error).

GENUS *ZEUSIUS* WELLS, 2007.

Type species: *Hinulia branchialis* Günther, 1867.

Diagnosis: A group of medium-sized lizards similar in many respects to Bluetongues (*Tiliqua*), but with slender heads, necks, bodies and a long-slender tail which is at least as long as the body if an original tail. Anterior ear lobules present; scales smooth, subequal; no supranasals or divided nasal scales; a scaly movable lower eyelid; parietal scales not in contact behind the interparietal; third and fourth toes subequal or the third toe is slightly longer than the fourth; subdigital lamellae undivided. Separated from the morphologically similar *Cyclodomorphus* Fitzinger, 1843 by the presence of a post narial groove.

They may be diurnal, crepuscular or nocturnal.

Distribution: Broadly found in the drier parts of the western two-thirds of Australia, including parts of Victoria, New South Wales, Queensland, the Northern Territory, South Australia and Western Australia.

Etymology: See Wells (2007).

Content: *Zeusius branchialis* **(**Günther, 1867) (type species); *Z. celastus* (Shea and Miller, 1995); *Z. maximus* (Storr, 1976); *Z. melanops* (Sterling and Zeitz, 1893) (including at least three recognized subspecies); *Z. venustus* (Shea and Miller, 1995).

GENUS *LAZARUSUS GEN. NOV.*

Type species: *Cyclodus adelaidensis* Peters, 1863.

Diagnosis: These medium sized mainly diurnal and crepuscular, live-bearing lizards are separated from all other Australian skinks and defined as follows: Short pentadactyle limbs and short, thinnish rounded tails ending in a point which is usually slightly shorter than the body. Dorsal scales are moderate and smooth. Head shields are smooth, symmetrical and unfragmented; subdigital lamellae are undivided. No supranasals or divided nasal scales. A scaly movable lower eyelid; parietal scales when distinct are not in contact behind the interparietal; third and fourth toes are either subequal or the third toe is slightly longer than the fourth.

Lazarusus gen. nov. is separated from the otherwise similar *Tiliqua* by the following suite of characters: Anterior temporal scales are more or less equal to others, being not much longer than broad; more than 32 mid-body rows; body without distinct cross bands; and at most a single row of enlarged scales on the neck between the interparietal and the smaller body scales.

Distribution: Mount Lofty Range and adjacent slopes and lowlands of South Australia from near Peterborough in the north south to Kapunda.

Etymology: The species monotypic for this genus, was regarded as being probably extinct (Hoser, 1991), before it was rediscovered shortly after the book was published. As the species was brought back from the dead, so to speak, it makes sense that its genus should be named in honour of Lazarus who according to the Bible was also brought back from the dead.

Lazarus of Bethany, also known as Saint Lazarus or Lazarus of the Four Days, is the subject of a prominent (alleged) miracle attributed to Jesus in the Gospel of John, in which Jesus allegedly restored him to life four days after his death.

Content: *Lazarusus adelaidensis* (Peters, 1863) (monotypic).

NOTES ON THE NEW DESCRIPTION FOR ANY POTENTIAL REVISERS

Unless mandated by the rules of the *International Code of Zoological Nomenclature*, the spelling of the newly proposed name should not be altered in any way.

REFERENCES CITED

Cogger, H. G. 2014. *Reptiles and Amphibians of Australia* (Seventh edition), CSIRO. Sydney, Australia:1064 pp.

Cogger, H. G., Cameron, E. E. and Cogger, H. M. 1983. *Zoological Catalogue of Australia (1): Amphibia and Reptilia*. Australian Government Publishing Service, Canberra, ACT, Australia:313 pp.

Court of Appeal Victoria 2014. Hoser v Department of Sustainability and Environment [2014] VSCA 206 (5 Sept. 2014).

Duméril, A. M. C. and Bibron, G. 1839. *Erpétologie Générale on Histoire Naturelle Complète des Reptiles*. Vol.5. Roret/Fain et Thunot, Paris:871 pp.

Fitzinger, L. 1843. *Systema reptilium. Fasciculus primus Amblyglossae*. Braiimiiller et Seidel, Vindobonae:106 pp.

Gray, J. E. 1825. A synopsis of the genera of reptiles and Amphibia, with a description of some new species. *Annals of Philosophy*, 10:193-217.

Gray, J. E. 1845. *Catalogue of the specimens of lizards in the collection of the British Museum.* Trustees of die British Museum/ Edward Newman, London: xxvii+289 pp.

Günther, A. 1867. Additions to the knowledge of Australian reptiles and fishes. *Ann. Mag. nat. Hist.* (3)20:45-57

Hoser, R. T. 1989. *Australian Reptiles and Frogs*. Pierson and Co., Mosman, NSW, Australia:238 pp.

Kaiser, H., Crother, B. I., Kelly, C. M. R., Luiselli, L., O'Shea, M., Ota, H., Passos, P., Schleip, W. D. and Wüster, W. 2013. Best Practices: In the 21st Century, Taxonomic Decisions in Herpetology are Acceptable Only When Supported by a Body of Evidence and Published via Peer-Review. *Herpetological Review* 44(1):8-23.

Mitchell, F. J. 1950. The scincid genera *Egernia* and *Tiliqua* (Lacertilia). *Rec. South Austral. Mus*. 9:275-308.

Peters, W. C. H. 1863. Eine Übersicht der von Hrn. Richard Schomburgk an das zoologische Museum eingesandten Amphibien, aus Buchsfelde bei Adelaide in Südaustralien. *Monatsber. königl. Akad. Wiss*. Berlin. 1863 (April):228-236.

Peters, W. C. H. 1867. Herpetologische Notizen. *Monatsber. königl. Akad. Wiss*. Berlin. 1867 (January):13-37.

Pyron, R. A., Burbrink, F. T. and Wiens, J. J. 2013. A phylogeny and revised classification of Squamata, including 4161 species of lizards and snakes. *BMC Evolutionary Biology* 13:93.

Quoy, J. R. and Gaimard, J. P. 1824. Zoologie. In: de Freycinet, M. L.: *Voyage Autour du Monde, Entrepris par le ministére et conformément aux instructions de s. exc. M. le Vicomte du Bouchage, Secrétaire d'etat au Department de la Marine, Exécuté sur les corvettes de S.M.* l'Uranie et la Paris. iv+712 pp.

Ride, W. D. L. (ed.) *et al.* (on behalf of the International Commission on Zoological Nomenclature) 1999. *International code of Zoological Nomenclature* (Fourth edition). The Natural History Museum - Cromwell Road, London SW7 5BD, UK.

Schneider, J. G. 1801. *Historiae Amphibiorum naturalis et literariae. Fasciculus secundus continens Crocodilos, Scincos, Chamaesauras, Boas. Pseudoboas, Elapes, Angues. Amphisbaenas et Caecilias*. Frommanni, Jena:374 pp.

Shea, G. M. and Miller, B. 1995. A Taxonomic Revision of the *Cyclodomorphus branchialis* Species Group (Squamata: Scincidae). *Records of the Australian Museum* 47:265-325.

Sternfeld, R. 1919. Neue Schlangen und Echsen aus Zentralaustralien. *Senckenbergiana* 1:76-83.

Stirling, E. C. and Zietz, A. 1893. Scientific results of the Elder Exploring Expedition. Vertebrata. Mammalia, Reptilia. *Transactions of the Royal Society of South Australia*, 16:154-176.

Storr, G. M. 1976. The genus *Omolepida* (Lacertilia, Scincidae) in Western Australia. *Rec. West. Aust. Mus.* 4:163-170.

Victorian Civil and Administrative Tribunal (VCAT). 2015. *Hoser v Department of Environment Land Water and Planning* (Review and Regulation) [2015] VCAT 1147 (30 July 2015).

Wells, R. W. and C. R. Wellington. 1985. A classification of the Amphibia and Reptilia of Australia. *Australian Journal of Herpetology Supplementary Series* 1:1-61.

Wells, R. 2007. Some Taxonomic and Nomenclatural Considerations on the Class Reptilia in Australia.

The genus *Cyclodomorphus* Fitzinger, 1843 with a New Interpretation of the *Cyclodomorphus branchialis* species-group. *Australian Biodiversity Record* 2007(4):1-23.

White, J. 1790. *Journal of a voyage to new South Wales, with sixty-five plates of non descript animals, birds, lizards, serpents, curious cones of trees and other natural productions.* Debrett, London:229 pp.

CONFLICT OF INTEREST

The author has no known conflicts of interest in terms of this paper and conclusions within.

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