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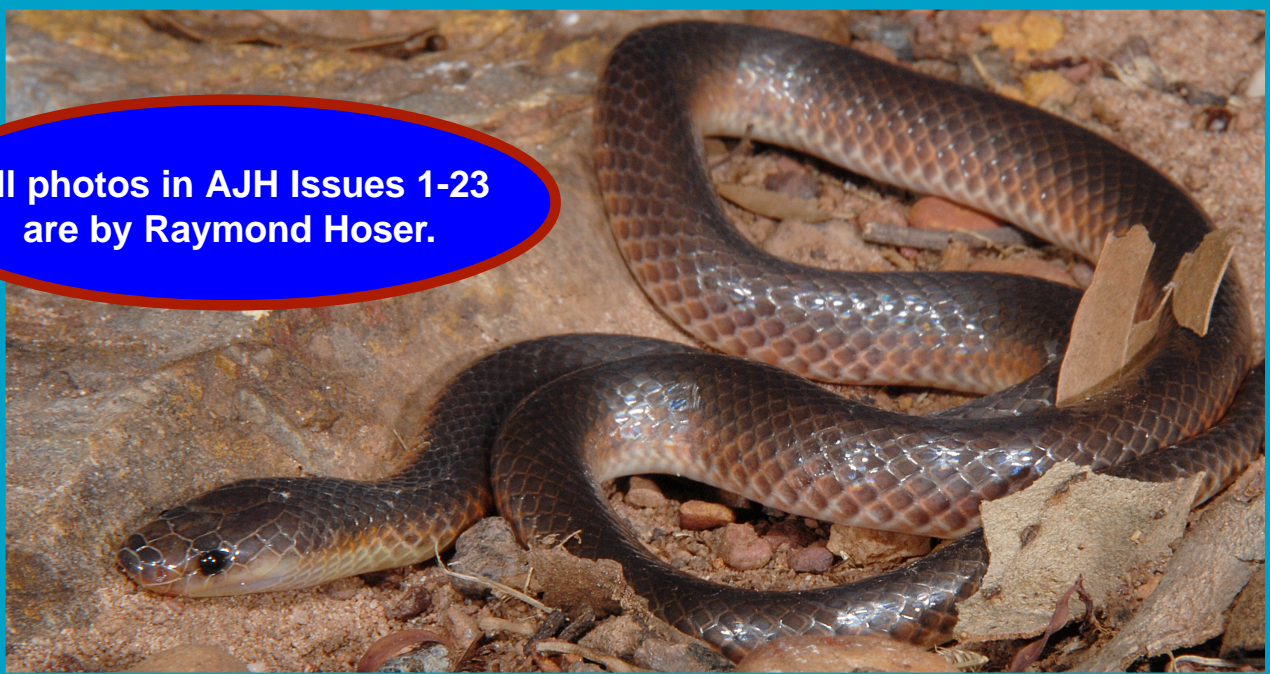
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A long overdue taxonomic rearrangement of the New Guinea Crowned Snakes, currently referred to the genus *Aspidomorphus* Fitzinger, 1843 (Serpentes:Elapidae).

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ABSTRACT

As generally recognized at present, the principally New Guinea genus *Aspidomorphus* Fitzinger, 1843 consists of three morphologically similar species, all found in the New Guinea region. Morphological studies, notably that of McDowell and Cogger (1967) have shown the three nominate forms to be divergent in terms of conservative traits such as hemipene morphology. Regional forms of these are also sufficiently differentiated to warrant taxonomic recognition.

Recent molecular studies, including that of Metzger *et al.* (2010) have further shown each of the three widely recognized species of *Aspidomorphus* to be composite along the same lines as indicated by the morphological data published by McDowell (1967). Metzger *et al.* (2010) also showed that the three widely recognized species of the present time, each consist of widely divergent lineages, warranting individual taxonomic recognition at the genus level.

Following on from these past studies and merging the results, this paper takes a conservative position and splits *Aspidomorphus* into three genera, two being named and defined for the first time in accordance with the Zoological Code (Ride *et al.* 1999).

Furthermore, *Aspidomorphus muelleri* (Schlegel, 1837) as presently recognized is divided into four species, two formally named for the first time; as well as two new subspecies, both formally named for the first time; *Aspidomorphus schlegeli* (Günther, 1872) is divided into two species, one formally named for the first time and *Aspidomorphus lineaticollis* (Werner, 1903) is divided into six species, with four formally named for the first time.

The subtribe Aspidomorphina Hoser, 2012, is herein elevated to full tribe status, thereby becoming Aspidomorphini *tribe nov.*

Keywords: Taxonomy; Australasia; New Guinea; Indonesia; Papua; Irian Jaya; Milne Bay; Elapidae; Micropechiini; Aspidomorphini; Aspidomorphina; genus; *Aspidomorphus*; species; *muelleri*; *schlegeli*; *lineaticollis*; *lineatus*; *interruptus*; new genera; *Walmsleyus*; *Pilgerus*; new species; *coggeri*; *keneficki*; *anstisae*; *assangei*; *nardellai*; *macki*; *mooreae*; new subspecies; *macdowellii*; *tamisi*.

INTRODUCTION

As generally recognized at present, the principally New Guinea genus *Aspidomorphus* Fitzinger, 1843 consists of three morphologically similar species, all found in the New Guinea region. Morphological studies, notably that of McDowell and Cogger (1967) have shown the three nominate forms to be divergent in terms of conservative traits such as hemipene morphology and scalation.

Regional forms of these are also sufficiently differentiated to warrant taxonomic recognition.

History has shown McDowell to have failed to realize the taxonomic significance of differences in morphology of snakes as first identified in his landmark taxonomic studies of the latter twentieth century.

However, recent molecular studies, including that of Metzger *et al.* (2010) have also shown each of the three widely recognized species of *Aspidomorphus* to be composite and along the same lines as indicated by the morphological data published by McDowell and Cogger in 1967. Metzger *et al.* (2010) also showed that the three widely recognized species of the present time, each consist of widely divergent lineages, warranting individual taxonomic recognition at the genus level.

Following on from these past studies of both McDowell and Cogger (1967) and Metzger *et al.* (2010) as well as other lesser studies of these snakes, including my own, as well as relevant studies of other New Guinea taxa (e.g. Zug 2004) and merging the results, this paper takes a conservative position and splits

Aspidomorphus into three genera, two being named and defined for the first time in accordance with the Zoological Code (Ride *et al.* 1999).

It should be noted that in terms of divergence, these newly named genera are considerably more divergent than other well recognized Australasian elapid genera such as the genera *Tropidechis* Günther, 1863, *Notechis* Boulenger, 1896 and *Austrelaps* Worrell 1963, with all three as a group being far less divergent.

Furthermore, *Aspidomorphus muelleri* (Schlegel, 1837) as presently recognized is divided into four species, two formally named for the first time; as well as two new subspecies, both formally named for the first time; *Aspidomorphus schlegeli* (Günther, 1872) is divided into two species, one formally named for the first time and *Aspidomorphus lineaticollis* (Werner, 1903) is divided into six species, with four formally named for the first time.

McDowall and Cogger (1967) did an excellent job of defining differences between the various taxa identified within this paper with little need to add further diagnostic material in order to differentiate the relevant taxa. As it happens, there is strong merit in publishing a species diagnosis that is both relatively simple, brief and easy to understand, including by lay people. This is because it is important that species be easily recognized by as many people as possible, including government regulators and others who may play an important role in managing the species at a later date.

The same applies for those working with the relevant taxa in the field.

The geological history of the New Guinea region that underpins a lot of the phylogeny of the relevant species has been well documented elsewhere (e.g. Dow, 1977 and Cloos *et al.* 2005 and sources cited therein) and is not repeated in this preamble. The history of the main features relevant to the distributions and phylogenies of the snakes are well known. These include the obvious ocean barriers, some of them being dry land during glacial maxima, as well as the land area known as the Solomons Arc, accreting to the main part of New Guinea as a region of northern ranges, and of course the main central cordillera, splitting the north from the south in terms of the main New Guinea land mass.

The molecular phylogeny of the various taxa formally described herein has been documented in detail by Metzger *et al.* (2010) and is not repeated herein.

Suffice to say that in terms of each of the species described herein, each are morphologically distinct from one another, are not known to cross-breed, all have strong divergence from one another in terms of their molecular phylogenies (that is ancient divergences measured in the millions of years) and each have allopatric distributions in terms of similar taxa with which they have been confused in the recent past, this being species they were included with by Sam McDowall in 1967.

By any reasonable definition they each consist of proper species and so I have no hesitation in describing each as such within this paper.

In the event a later author seeks to merge one or more genera or species described within this paper, the order of priority should be by page priority in terms of this paper. Gender, spellings and the like of names should not be altered in any way unless mandated by the Zoological Code, even if apparently wrong in the original descriptions herein.

Relevant published literature in terms of the taxonomy of the snakes referred until now to the genus *Aspidomorphus* includes the following: Boulenger (1895, 1896), Brongersma (1934, 1952a, 1952b, 1957), Burt and Burt (1932), de Rooij (1917), Duméril *et al.* (1854), Fitzinger (1843), Focart (1953), Günther (1872), Haas (1930), Haas (1950), Hoser (2012), Iskandar and Erdelen (2006), Klemmer (1963), Kraus (2013), Loveridge (1946, 1948), McDowall and Cogger (1967), Metzger *et al.*

(2010), O'Shea (1996), Parker (1936), Pyron *et al.* (2013), Ruiters (1960), Schlegel (1837), Tiedemann and Grillitsch (1999), Werner (1899, 1903, 1925), Williams and Parker (1964), Worrell (1961, 1963a, 1963b) and sources cited therein.

In view of the findings of Metzger *et al.* (2010) and Pyron *et al.* (2013), the subtribe Aspidomorphina Hoser, 2012, as defined by Hoser (2012), is herein elevated to full tribe status, thereby becoming Aspidomorphini *tribe nov.* by effectively adopting the same diagnosis. The subtribe Aspidomorphina should be also maintained to allow for the inevitable need for use when dealing with fossil material.

TRIBE ASPIDOMORPHINI TRIBE NOV.

(Terminal Taxon: *Aspidomorphus muelleri*)

Diagnosis: Separated from all other Australasian and Melanesian land dwelling (non-sea snake) elapids and others in the tribe Micropechiini by the following suite of characters:

Snakes of moderate to slender build, usually around 400 mm in total length as adults and never more than 650 mm as adults; head flattened and slightly distinct from the neck which is noticeably narrower but not unduly narrow; shortish tail, small to medium sized eye with a vertically elliptical pupil, although this is hard to determine in specimens by day, colouration is highly variable, but always includes a white bar running from the snout, below (but joining) the eye and posterior to the neck, where it fuses to the dorsal ventral colour change; dorsally colouration is usually a ground colour and the lighter venter is usually one colour, scalation is smooth and shiny with 15 midbody rows, 138-182 ventrals, divided anal plate, 19-41 subcaudals, no loreal, 6 supralabials, with the third and fourth in contact with the eye, a single preocular in contact with the nasal and second supralabial, 1-2 postoculars and 7 infralabials; known as "Crowned snakes", this is because many individuals have a distinct lighter coloured crown on the top of the head and near neck region, often broken with darker pigment with a wide dark band running on either side of the head broadly in line with the eye and widening posteriorly; when a crown is not present there is usually a change in colour intensity in the scales in the same regions of the head. Known to inhabit forests to an elevation of at least 1,500 metres.

The above is adapted from Hoser, 2012, with the tribe diagnosis being as for the subtribe Aspidomorphina Hoser, 2012, but with the genus *Aspidomorphus* Fitzinger 1843 divided three ways as per this paper.

Content: *Aspidomorphus* Fitzinger, 1843; *Pilgerus gen. nov.* (this paper); *Assangeus gen. nov.* (this paper).

GENUS ASPIDOMORPHUS FITZINGER, 1843.

Type species: *Elaps muelleri* Schlegel, 1837.

Diagnosis: Separated from all other members of the tribe Aspidomorphini *tribe nov.* by the following suite of characters: Tip of anterior medial (palatine) process of maxilla separated from tip of anteromedial

process of ectopterygoid by a (ligament-filled) gap shorter than the basal diameter of the fang; one solid maxillary tooth anterior to posterior medial (ectopterygoid) process of maxilla; longest anterior dentary tooth followed by a series of rather widely spaced teeth of progressively diminishing length; hemipenis proximally with two transverse tiers of conspicuously enlarged spines; distal end of hemipenis papillose. Sulcus spermaticus divided longitudinally by a membrane proximal to the divergence of the distal branches of the sulcus; proximal two tiers of enlarged hemipenial spines followed abruptly by much shorter spines; pupil almost circular; black pigment on parietal forming ocelli.

In common with other members of the tribe Aspidomorphini *tribe nov.* this genus is diagnosed and characterized as follows: Snakes of moderate to slender build, usually around 400 mm in total length as adults and never more than 650 mm as adults; head flattened and slightly distinct from the neck which is noticeably narrower but not unduly narrow; shortish tail, small to

medium sized eye with a vertically elliptical pupil, although this is hard to determine in specimens by day, colouration is highly variable, but always includes a white bar running from the snout, below (but joining) the eye and posterior to the neck, where it fuses to the dorsal ventral colour change; dorsally colouration is usually a ground colour and the lighter venter is usually one colour, scalation is smooth and shiny with 15 midbody rows, 138-182 ventrals, divided anal plate, 19-41 subcaudals, no loreal, 6 supralabials, with the third and fourth in contact with the eye, a single preocular in contact with the nasal and second supralabial, 1-2 postoculars and 7 infralabials; known as "Crowned snakes", this is because many individuals have a distinct lighter coloured crown on the top of the head and near neck region, often broken with darker pigment with a wide dark band running on either side of the head broadly in line with the eye and widening posteriorly; when a crown is not present there is usually a change in colour intensity in the scales in the same regions of the head. These snakes are known to inhabit forests to an elevation of at least 1,500 metres.

Distribution: New Guinea and adjacent islands including the Bismark Archipelago and Seram.

Content: *Aspidomorphus muelleri* (Schlegel, 1837); *A. interruptus* Brongersma, 1934; *A. keneficki sp. nov.* (this paper); *A. coggeri sp. nov.* (this paper).

ASPIDOMORPHUS MUELLERI (SCHLEGEL, 1837).

Diagnosis: As for genus (above). The diagnosis for the separation of the subspecies and species formerly identified as being within this species is given in the accounts that follow.

Distribution: North-west island New Guinea, including both north and south coastal areas and adjacent outlier islands.

ASPIDOMORPHUS MUELLERI TAMISI SUBSP. NOV.

Holotype: Specimen number AMNH 57528 from the Upper Fly River, Western Province, Papua New Guinea, held at the American Museum of Natural History, New York, USA. The American Museum of Natural History is a public facility that allows researchers access to specimens.

Paratype: Specimen number AMNH 57531 from the Upper Fly River, Western Province, Papua New Guinea, held at the American Museum of Natural History, New York, USA. The American Museum of Natural History is a public facility that allows researchers access to specimens.

Diagnosis: *A. muelleri tamisi subsp. nov.* is separated from all others in the *A. muelleri* species complex by the following suite of characters: An absence of a distinctive collar on the back of the neck; no ocelli of any sort on the top of the head; no stripes on the mental or rostral; the throat and lower neck are merely clouded with gray, rather than being dark brown, dark grey or nearly black.

Distribution: Known only from Western Province, PNG.

Etymology: Named in honour of Paul Tamis of Moolap, Geelong, Victoria, Australia, in recognition of his valuable and largely unrecognized contributions to herpetology in Australia, including in his role as a long-time committee member of the Victorian Association of Amateur Herpetologists (VAAH).

ASPIDOMORPHUS INTERRUPTUS BRONGERSMA, 1934.

Diagnosis: This species is redefined herein as two geographically separated subspecies. *A. interruptus interruptus* is separated from all other snakes formerly referred to *A. muelleri* (Schlegel, 1837), including the new species and subspecies described herein by the following suite of characters: A distinctive whitish collar on the neck, not seen in *A. muelleri*, *A. macdowellii subsp. nov.* or *A. keneficki sp. nov.*. *A. interruptus* differs from *A. coggeri sp. nov.* from the mainland of PNG in having brown, rather than black ocelli on the head and in having the brown of the back extending well down onto the tips of the ventrals. *A. interruptus* has a faint rostral stripe, but the mental stripe is distinct.

A. interruptus macdowellii subsp. nov. formally described below is

separated from the other species formerly referred to *A. muelleri* including the new species and subspecies described herein from the *A. muelleri* complex by its concolour phase that is brown above with pale upper lip (broken into three parts anterior to the eye, broken under the eye and then continuous beyond the eye onto the neck), with large dark flecks within the pale marking on the upper lip, the posterior section not extending more than the length of the head beyond the head; pale below (except anteriorly, where the colouration is dark) and with an absence of a highly distinct whitish nape across the back of the neck.

While *A. interruptus macdowellii subsp. nov.* is quite distinct from nominate *A. interruptus* in appearance and not likely to be confused with it, molecular evidence published by Metzger *et al.* (2010), shows only a 2.5% divergence and so I have taken a conservative position and accorded the new taxon subspecies status.

Distribution: *A. interruptus interruptus* is known from the Bismarck Archipelago. *A. interruptus macdowellii subsp. nov.* is known from Northern New Guinea west of the Huon Peninsula.

ASPIDOMORPHUS INTERRUPTUS MACDOWELLI SUBSP. NOV.

Holotype: Specimen number: AMNH 62029, at the American Museum of Natural History, New York, USA from Hollandia, (Jayapura), West New Guinea. The American Museum of Natural History is a public facility that allows researchers access to specimens.

Paratype: Specimen number: AMNH 75239, at the American Museum of Natural History, New York, USA, from Wewak, East Sepik Province, Papua New Guinea. The American Museum of Natural History is a public facility that allows researchers access to specimens.

Diagnosis: *A. interruptus macdowellii subsp. nov.* is separated from the other species formerly referred to *A. muelleri* including the new species and subspecies described herein from the *A. muelleri* complex by its concolour phase that is brown above with pale upper lip (broken into three parts anterior to the eye, broken under the eye and then continuous beyond the eye onto the neck), with large dark flecks within the pale marking on the upper lip, the posterior section not extending more than the length of the head beyond the head; pale below (except anteriorly, where the colouration is dark) and with an absence of a highly distinct whitish nape across the back of the neck.

While *A. interruptus macdowellii subsp. nov.* is quite distinct from nominate *A. interruptus*, molecular evidence published by Metzger *et al.* (2010), shows only a 2.5% divergence and so I have accorded the new taxon subspecies status.

Distribution: Northern island New Guinea in the region west of the Sepik Valley and into Indonesian Papua in the region of the north coast and nearby areas, north of the central cordillera.

Etymology: Named in honour of USA-based herpetologist Samuel B. McDowell, in recognition of his major works on New Guinea snakes.

ASPIDOMORPHUS KENEFICKI SP. NOV.

Holotype: A specimen at the British Museum of Natural History, London, (now known as the Natural History Museum) UK, specimen number: BM 1963:2.28.27 from North Seram, Indonesia. The Natural History Museum in the UK is a government funded facility that allows scientists access to their specimens.

Diagnosis: *A. keneficki sp. nov.* is separated from *A. muelleri* including the new species and subspecies described herein from the *A. muelleri* complex by the following suite of characters: An absence of three distinct whitish blotches on the upper lip anterior to the eye, sometimes merged in other species, but remaining distinct, instead this region being of similar colour to the rest of the snout, only lightening slightly on the supralabial beneath the front of the eye.

Furthermore, in common with other species within the *A.*

muelleri complex there is a dark patch immediately beneath the eye, followed by a white bar extending posteriorly along the back of the head and onto the neck. Unlike in the other species, in the *A. muelleri* complex the thick white bar extends more than a full head length beyond the rear of the head, running along the neck in a line slightly below the mid-lateral section of the snake, before breaking up at the lower flank.

The ocelli on the head are also relatively indistinct.

A. keneficki sp. nov. females are separated from all others in the *A. muelleri* species complex by having 178 ventrals and 34 subcaudals versus 177 or less ventrals and 32 subcaudals or less in the other taxa.

Distribution: Known only from Seram, Indonesia, but presumably on immediately adjacent outlier islands with suitable habitat.

Etymology: Named in honour of Kene Fick, an auto-electrician of great skill at Port Augusta, South Australia, Australia, who did for no charge provide essential logistical support for the Snakebusters wildlife educators and researchers while working in remote parts of Australia in 2013.

It is not just scientists who make a valuable contribution to science, but also those people who provide the resources and logistics to allow the research to continue, even if those people have no relevant scientific expertise themselves. It is fitting that etymologies for species include such people and I make no apologies for naming species in recognition of these people.

ASPIDOMORPHUS COGGERI SP. NOV.

Holotype: A specimen number: AMNH 73972 at the American Museum of Natural History, New York, USA, from the Kwagira River, Papua New Guinea. The American Museum of Natural History is a public facility that allows researchers access to specimens.

Diagnosis: *A. coggeri* sp. nov. and *A. interruptus interruptus* are separated from *A. muelleri* including the new species and subspecies described herein from the *A. muelleri* complex by the presence of a distinctive whitish collar on the neck, not seen in *A. muelleri*, *A. interruptus maddockelli* subsp. nov. or *A. keneficki* sp. nov.. *A. interruptus interruptus* from the Bismark Archipelago differs from *A. coggeri* sp. nov. from the mainland of PNG in having brown, rather than black ocelli on the head and in having the brown of the back extending well down onto the tips of the ventrals. *A. interruptus* have the rostral stripe faint, but the mental stripe distinct, a condition also occasionally seen in *A. coggeri* sp. nov.. However as a rule in *A. coggeri* sp. nov. both mental and rostral stripes are distinct. *A. coggeri* sp. nov. have 14 or less solid maxillary teeth versus more than this number in all in the other species within the *A. muelleri* complex.

Female *A. coggeri* sp. nov. have under 170 ventrals, versus over 170 in the other species within the *A. muelleri* complex.

Distribution: PNG generally in the region east of Huon Peninsula on the north side of the Island and east of the Fly River on the south side of the central cordillera.

Etymology: Named in honour of Harold G. Cogger, former deputy director of the Australian Museum of Sydney, NSW, Australia, in recognition of his several major books on Australian reptiles.

WALMSLEYUS GEN. NOV.

Type species: *Diemenia schlegelii* Günther, 1872.

Diagnosis: Separated from all other members of the tribe Aspidomorphini *tribe nov.* by the following suite of characters: Tip of palatine process of maxilla separated from the tip of anteromedial process of ectopterygoid by a (ligament-filled) gap longer than half the length of the fang; three solid maxillary teeth anterior to ectopterygoid process of the maxilla; longest anterior dentary tooth followed by a distinct diastema, in turn followed by abruptly smaller teeth similar in length to those of the middle of the dentary; hemipenis without enlarged proximal spines; apex of hemipenis with longitudinal fleshy folds.

Distribution: North-west Island New Guinea and immediately

adjacent nearby islands, only extending into Papua New Guinea in the region of the north coast and west of the Huon Peninsula.

Etymology: Named in honour of Dr. John Walmsley, in recognition of his immense, but ultimately failed attempts to ensure the survival of Australia's most endangered mammals in the period from the late 1960's to the mid 2000's (nearly four decades).

Dr John Walmsley (born 1938) was born in Ourimbah, New South Wales in 1938. His passion for Australian wildlife commenced when the seven-year-old Wamsleys family moved to a 67 hectare bushland block at Niagara Park. At age sixteen Walmsley became a trainee metallurgist with BHP. Dissatisfied with the job he became a labourer in BHP's open-hearth furnaces and worked a second job renovating run down houses. By age 23 Wamsley was a millionaire. Approximately two years later Wamsley entered the University of Newcastle, Australia. The thirty-year-old Wamsley graduated with a PhD in Mathematics from the University of Queensland and moved to Flinders University to lecture.

In June 1969 he purchased a farm at Mylor, South Australia, that was to become Wamsley's first sanctuary, Warrawong. Wamsley eradicated all feral plants and animals from the sanctuary and erected a surrounding fence to preserve the sanctuary's feral animal-free state. That is he removed, foxes, cats and rabbits.

The sanctuary was a success, not only breeding rare and endangered wildlife, but also financially as well. His stock-exchange-listed enterprise became a multi-million dollar powerhouse. As his business expanded to include similar sanctuaries in NSW and Victoria, the government-owned zoos, along with other government wildlife bureaucrats tied to the same bureaucracies ganged up on him to shut him down.

This was done by ruthless tactics, including illegal armed raids, countless false and defamatory allegations and unfair discriminatory regulation on his business in a way that eventually caused his business to shut down.

By 2005, the company was effectively wound up.

Walmsley later gave an account of the rise and fall of his conservation enterprise and detailed how government-owned zoos used ruthless tactics to destroy him and his business, so that now, Walmsley has been effectively banished to obscurity and with a personal reputation in tatters.

Part of his story read as follows:

"Warrawong Sanctuary demonstrated that Australia need not lose its wildlife, It also showed the way to go. However, one important point was that it took thirteen years to complete.

Why it took so long demonstrated the real problem.

When development of Warrawong Sanctuary commenced in 1969, there were three groups of people who's perceived job it was to save our wildlife. They were Adelaide Zoo, Adelaide Museum and the South Australian National Parks and Wildlife Service. These three groups between them consumed the available public funds for conservation. There was room for no-one else. The concept of Warrawong seemed to terrify them. This terror reached its summit in 1975 when, as I stated earlier, the then Premier of South Australia, the honourable Mr Don Dunstan, called a Special Executive Council Meeting of the South Australian Parliament and ordered the Police Commissioner to lock me up.

Without this understanding, of the terror that a possible competitor struck to the very hearts of these honourable ladies and gentlemen, it would be easy to make the grave mistake of trusting them. It would then be easy to make the much graver mistake of co-operating with them. That is where the greatest danger lies - cooperation - the buzz word of monopolists all over the world."

Content: *Walmsleyus schlegelii* (Günther, 1872); *W. anstisae* sp. nov. (this paper).

WALMSLEYUS SCHLEGELI (GUNTHER, 1872).

Diagnosis: As for the genus as diagnosed above and also see the specific diagnosis herein:

W. anstisae sp. nov., the only other species in the genus is separated from *W. schlegeli* by being of the concolour phase and nearly uniform brown in dorsal colour although the anterior body has a dark lateral stripe down each side with a whitish ventral hue obvious on the lower flanks. In *W. anstisae* sp. nov. the white upper labial stripe while partly broken under the eye, does in fact join to make it effectively continuous.

W. anstisae sp. nov., the only other species in the genus is further separated from *W. schlegeli* by having less than 150 ventrals in females, versus more than 150 in females of *W. schlegeli*.

Distribution: *W. schlegeli* is known from the western part of island New Guinea, exclusively within Irian Jaya. *W. anstisae* sp. nov. is only known from the coastal region on the northern part of island New Guinea in the area of the PNG/Irian Jaya border.

WALMSLEYUS ANSTISAE SP. NOV.

Holotype: Specimen number BPBM 23433 at the Bernice Pauahi Bishop Museum, Hawaii, USA, collected from the Torricelli Mtns, West Sepik, Papua New Guinea. The Bernice Pauahi Bishop Museum, Hawaii, USA is a public facility that allows zoologists access to their collection.

Paratype: Specimen number BPBM 23434 at the Bernice Pauahi Bishop Museum, Hawaii, USA, collected from the Torricelli Mtns, West Sepik, Papua New Guinea. The Bernice Pauahi Bishop Museum, Hawaii, USA is a public facility that allows zoologists access to their collection.

Diagnosis: *W. anstisae* sp. nov. is separated from *W. schlegeli* the only other species in the genus by being of the concolour phase and nearly uniform brown in dorsal colour although the anterior body has a dark lateral stripe down each side with a whitish ventral hue obvious on the lower flanks. In *W. anstisae* sp. nov. the white upper labial stripe while partly broken under the eye, does in fact join to make it effectively continuous.

W. anstisae sp. nov. is further separated from *W. schlegeli* by having less than 150 ventrals in females, versus more than 150 in *W. schlegeli*.

W. anstisae sp. nov. is further diagnosed by the following characters: Tip of palatine process of maxilla separated from the tip of anteromedial process of ectopterygoid by a (ligament-filled) gap longer than half the length of the fang; three solid maxillary teeth anterior to ectopterygoid process of the maxilla; longest anterior dentary tooth followed by a distinct diastema, in turn followed by abruptly smaller teeth similar in length to those of the middle of the dentary; hemipenis without enlarged proximal spines; apex of hemipenis with longitudinal fleshy folds.

Distribution: *W. anstisae* sp. nov. is only known from the coastal region on the northern part of island New Guinea in the region near the PNG/Irian Jaya border. *W. schlegeli* is known from the western part of island New Guinea, exclusively within Irian Jaya.

Etymology: Named in honour of NSW-based school teacher Marion Anstis in recognition of a lifetime spent teaching people about Australian wildlife, in particular frogs, further recognizing her excellent published books on Australian frogs and tadpoles.

PILGERUS GEN. NOV.

Type species: *Pseudelaps muelleri* var. *lineaticollis* Werner, 1903.

Diagnosis: Tip of anterior medial (palatine) process of maxilla separated from tip of anteromedial process of ectopterygoid by a (ligament-filled) gap shorter than the basal diameter of the fang; one solid maxillary tooth anterior to posterior medial (ectopterygoid) process of maxilla; longest anterior dentary tooth followed by a series of rather widely spaced teeth of progressively diminishing length; hemipenis proximally with two transverse tiers of conspicuously enlarged spines; distal end of

hemipenis papillose; sulcus spermaticus of hemipenis not divided proximal to divergent furcation of sulcus; proximal enlarged hemipenial spines followed more distally by tiers of progressively smaller spines, so that there is a gradual transition between the enlarged proximal hooks and the small distal spines; pupil conspicuously elliptical; black pigment on parietal organized as the dark dorsal border of an upper light line.

Distribution: Endemic to Papua New Guinea and nearby offshore islands, most notably those to the south-east.

Etymology: Named in honour of well-known Australian-born, British-based documentary film maker John Pilger, in recognition of his valiant attempts to document Australian history in an accurate manner, including his details of the genocidal atrocities committed by British invaders against the indigenous inhabitants of Australia.

Content: *Pilgerus lineaticollis* (Werner, 1903); *P. lineatus* (Brongersma, 1934); *P. assangei* sp. nov. (this paper); *P. nardellai* sp. nov. (this paper); *P. macki* sp. nov. (this paper); *P. mooreae* sp. nov. (this paper).

PILGERUS LINEATICOLLIS (WERNER, 1903).

Diagnosis: As for the genus. Relevant diagnoses for species formerly regarded as being within *P. lineaticollis* are given in the following text.

P. lineaticollis are readily separated from all others in the species complex by the considerably longer hemipenis in males in which the tip of the hemipene reaches the ninth subcaudal, versus number 7 or less in all other species, except some specimens of *P. assangei* sp. nov., where the length may occasionally get to reach the eighth subcaudal.

P. lineaticollis are separated from congeners (as described within this paper) by their higher number of solid maxillary teeth, being 14-18 in males and 17 or higher in females, versus 14 or lower in both sexes of all other species.

Distribution: Astrolobe Bay and nearby areas of northern New Guinea in the general vicinity of the Huon Peninsula.

PILGERUS LINEATUS (BRONGERSMA, 1934)

Diagnosis: *P. lineatus* are separated from all other species in the *P. lineaticollis* group by the following suite of characters: There is a distinct reduction of the number of spots on the upper surface of the head and there are more or less distinct dark lines on the back. The head bears only a few rather large dark spots on its upper surface, especially anteriorly; these spots are symmetrically arranged. Occiput with a median dark stripe. Only a few dark spots anteriorly. A light streak on the side of head and neck, extending on to the body, interrupted below the eye by a dark oblique bar. This light streak sometimes bordered above by a dark band. The light band is most distinct behind the eye. Throat is thickly powdered with grey to be darkish in colour; belly whitish, powdered with grey anteriorly or dark-coloured over its whole length. Back light brown with dark spots on the scales; these spots forming distinct longitudinal lines. There is no vertebral stripe, but dark lines are present on the neck. Numerous small but sharply bordered ocelli are present on the snout. The upper light line is evident on fourth and fifth scale rows of younger specimens, and the lower light line is distinguishable on the side of the snout anterior to the bridle.

Compared to other species in the *P. lineaticollis* complex *P. lineatus* have mid-range ventral and subcaudal counts in both sexes and likewise in terms of hemipenial structure.

Distribution: Woodlark Island, Papua New Guinea.

PILGERUS ASSANGEI SP. NOV.

Holotype: Specimen number AMNH 41637, at the American Museum of Natural History, New York, USA, from Fergusson Island, Papua New Guinea. The American Museum of Natural History, New York, USA is a public facility that allows zoologists access to their collection.

Paratypes: Specimen numbers AMNH 76643, AMNH 76644 and AMNH 76645 at the American Museum of Natural History,

New York, USA, from Fergusson Island, Papua New Guinea. The American Museum of Natural History, New York, USA is a public facility that allows zoologists access to their collection.

Diagnosis: *Pilgerus assangei* sp. nov. is similar in most respects to *P. lineatus*. However it is separated from that species by the following: 1/ the fact that each internasal and prefrontal bears a spot, although these are missing in some specimens; 2/ the frontal has a median dark stripe; 3/ each parietal bears a dark longitudinal stripe, bending inward anteriorly and just reaching the frontal.

In common with *P. lineatus*, *Pilgerus assangei* sp. nov. are separated from all other species in the *P. lineaticollis* group by the following suite of characters: There is a distinct reduction of the number of spots on the upper surface of the head and there are more or less distinct dark lines in the form of dashes on the back. The head bears only a few rather large dark spots on its upper surface, especially anteriorly; these spots are symmetrically arranged. Occiput with a median dark stripe. Only a few dark spots anteriorly. A light streak on the side of head and neck, extending on to the body, interrupted below the eye by a dark oblique bar. This light streak sometimes bordered above by a dark band. The light band is most distinct behind the eye. Throat is thickly powdered with grey but remains lightish in colour; belly whitish, powdered with grey anteriorly or dark-coloured over its whole length. Back light brown with dark spots on the scales; these spots forming distinct longitudinal lines. There is no vertebral stripe, but dark lines are present on the neck. Numerous small but sharply bordered ocelli are present on the snout. The upper light line is evident on fourth and fifth scale rows of younger specimens, and the lower light line is distinguishable on the side of the snout anterior to the bridle.

Distribution: The type series is from Fergusson Island, New Guinea, but at the present time specimens found on the immediately adjacent Goodenough and Normanby islands are referable to this taxon.

Etymology: Named in honour of Wikileaks founder Julian Assange, in recognition of his globally patriotic work for human rights and freedom from government tyranny in exposing reckless government corruption.

PILGERUS MACKI SP. NOV.

Holotype: Specimen number BPBM 17282 from Bunisi, Papua New Guinea, held at the Bernice Pauahi Bishop Museum, Hawaii, USA. The Bernice Pauahi Bishop Museum, Hawaii, USA is a public facility that allows zoologists access to their collection.

Paratype: Specimen number BPBM 17283 from Bunisi, Papua New Guinea, held at the Bernice Pauahi Bishop Museum, Hawaii, USA. The Bernice Pauahi Bishop Museum, Hawaii, USA is a public facility that allows zoologists access to their collection.

Diagnosis: *Pilgerus macki* sp. nov. is separated from *Pilgerus lineaticollis* by the low ventral count in both sexes, being under 150 in males, versus over 160 in *Pilgerus lineaticollis* or under 150 in females, versus over 150 in *Pilgerus lineaticollis*. In male *Pilgerus macki* sp. nov. the hemipenis tip ends at subcaudal 4-6, versus 7-9 in *Pilgerus lineaticollis*.

Pilgerus macki sp. nov. is separated from all other *Pilgerus* species by the following unique suite of characters: A distinct pattern but not including a distinct mental stripe; the throat is dark; less than 150 ventrals in both sexes; 14 solid maxillary teeth in males and 11 in females; the upper light line is distinct and on the third to fifth scale rows of the neck; there is a light vertebral stripe, although it is not prominent; there are well developed ocelli, like those of *Aspidomorphus muelleri* (and other species within *Aspidomorphus* as defined within this paper), which are present on the snout.

Distribution: The far south-east of the mainland of island New Guinea in the region of the Milne Bay province as well as the adjacent provinces to the west.

Etymology: Named in honour of former NSW Member of Parliament, Ted Mack, in recognition of his attempts to shine the light of ethics on the endemically corrupt NSW government and legal system.

PILGERUS NARDELLAI SP. NOV.

Holotype: Specimen number AMNH 76682 at the American Museum of Natural History, New York, USA, from Misima Island, Papua New Guinea. The American Museum of Natural History, New York, USA is a public facility that allows zoologists access to their collection.

Paratypes: Specimen numbers AMNH 76685 and AMNH 76695 at the American Museum of Natural History, New York, USA, from Misima Island, Papua New Guinea. The American Museum of Natural History, New York, USA is a public facility that allows zoologists access to their collection.

Diagnosis: *Pilgerus nardellai* sp. nov. are separated from all other *Pilgerus* species by the following suite of characters: high ventral and subcaudal counts (166-169 ventrals in males, 167-173 ventrals in females, over 30 subcaudals in both sexes), only being matched by *P. lineaticollis*; but with a low maxillary tooth count in both sexes (12-14), in line with specimens of *P. assangei* sp. nov. from the d'Entrecasteaux Archipelago. In *Pilgerus nardellai* sp. nov. the upper light line is evident on the fourth and fifth scale rows of younger specimens, but nearly obliterated in larger specimens. There is no vertebral stripe, nor are there dark lines on the neck. The black spotting of the head is reduced to inconspicuous flecks and dashes. The throat is dark.

Distribution: Misima Island, Papua New Guinea.

Etymology: Named in honour of Don Nardella. He has been an Australian Labor Party member of the Victorian Parliament since 1992 and in recent years unsuccessfully attempted to take action to stop endemic corruption in the Victorian Government, including the Liberal Party, most notably the corrupt member for Warrandyte, Ryan Smith and also the State Wildlife Department, calling itself most recently the Department of Sustainability and Environment (DSE) or Department of Environment and Primary Industry (DEPI).

Notwithstanding this recognition of Nardella's good work, it should be remembered that corruption is also endemic within the Australian Labor Party.

PILGERUS MOOREAE SP. NOV.

Holotype: Specimen number AMNH 76653 at the American Museum of Natural History, New York, USA, from Sudest Island, Papua New Guinea. The American Museum of Natural History, New York, USA is a public facility that allows zoologists access to their collection.

Paratype: Specimen numbers AMNH 76654 and 76652 at the American Museum of Natural History, New York, USA, from Sudest Island, Papua New Guinea. The American Museum of Natural History, New York, USA is a public facility that allows zoologists access to their collection.

Diagnosis: *Pilgerus mooreae* sp. nov. are separated from all other *Pilgerus* as defined within this paper by the fact that specimens do not have a bridle present (not even a faint one); there is a total absence of head-spotting, no trace of a vertebral line or of dark neck lines, but the lower light line is present.

Pilgerus mooreae sp. nov. are superficially similar in appearance to *Walmsleyus* gen. nov., but are readily diagnosed as being within the genus *Pilgerus* by the following characters: Tip of anterior medial (palatine) process of maxilla separated from tip of anteromedial process of ectopterygoid by a (ligament-filled) gap shorter than the basal diameter of the fang; one solid maxillary tooth anterior to posterior medial (ectopterygoid) process of maxilla; longest anterior dentary tooth followed by a series of rather widely spaced teeth of progressively diminishing length; hemipenis proximally with two transverse tiers of conspicuously enlarged spines; distal end of hemipenis

papillose; sulcus spermaticus of hemipenis not divided proximal to divergent furcation of sulcus; proximal enlarged hemipenial spines followed more distally by tiers of progressively smaller spines, so that there is a gradual transition between the enlarged proximal hooks and the small distal spines; pupil conspicuously elliptical; black pigment on parietal organized as the dark dorsal border of an upper light line.

Pilgerus mooreae sp. nov. are further diagnosed by the following suite of characters: 153-157 ventrals (both sexes); 26-30 subcaudals (both sexes); 11-13 solid maxillary teeth (both sexes).

Distribution: Sudest Island, Papua New Guinea.

Etymology: Named in honour of Sydney, NSW, Australia, politician Clover Moore. She has become the Lord Mayor of the City of Sydney in 2004. She was an independent member of the New South Wales Legislative Assembly from 1988 to 2012, representing the electorates of Bligh and Sydney. She has for many decades tried her best to improve the political integrity in the NSW government at both local and State levels, but been generally thwarted by more powerful vested interests.

CONFLICT OF INTEREST

This author reports no conflict of interest in terms of any material within this paper.

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***Smythkukri hunneangorum* a new species of Kukri Snake from Cambodia (Serpentes: Oligodonini: *Smythkukri*; *Geddykukrius*).**

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ABSTRACT

In 2012 this author (Hoser) divided the genus *Oligodon* Fitzinger, 1826 into 12 genera and 4 subgenera on the basis of divergent morphological traits and limited genetic analysis. This was derided as an act of "Taxonomic vandalism" by Kaiser (2012a and 2012b) and Kaiser *et al.* (2013), even though co-authors of the latter paper admitted that they had not in fact read the paper they were condemning (Schleip 2013a, Schleip 2013b, Schleip 2013c, Wüster 2013a, Wüster 2013b, Wüster 2013c), further noting that Kaiser (2012a) identified Wüster as author of the paper widely known and cited as Kaiser *et al.* (2013).

The divisions of *Oligodon sensu lato* as proposed by Hoser (2012) have in fact been validated by the molecular results of Pyron *et al.* (2013a, 2013b) in terms of the taxa for which they had results. These results effectively rebutted the false and baseless claims of taxonomic vandalism by Kaiser *et al.*

The taxon, *Smythkukri annamensis* (Leviton, 1953), (better known to date as *Oligodon annamensis* Leviton, 1953), was sufficiently divergent from the rest of the genus to be placed in a then monotypic subgenus *Geddykukrius* Hoser, 2012.

Therefore it is with great pleasure that I am able to formally name a second species, morphologically similar to *Smythkukri annamensis* (Leviton, 1953), within the same subgenus.

The new taxon *Smythkukri hunneangorum* described according to the Zoological Code (Ride *et al.* 1999) is from the Cardamom Mountains of southwest Cambodia. It is named in honour the original collectors Thy Neang and Seiha Hun both of Phnom Penh, Cambodia.

Keywords: Taxonomy; Snakes; Asia; Colubridae; Oligodonini; *Smythkukri*; *Geddykukrius*; *annamensis*; new species; *hunneangorum*.

INTRODUCTION

Until 2012, the snakes of the genus *Oligodon* Fitzinger, 1826 as then recognized consisted a large and diverse assemblage of morphologically conservative snakes from the south-east and east Asian region.

The so-called Kukri Snakes got their name from a distinctively shaped Nepalese knife, which is similar in shape to the broad, flattened, curved hind teeth these snakes possess.

These teeth are designed to assist in feeding on eggs, a dominant part of the diet of many species. They slit open eggs as they are being swallowed, allowing for easier digestion.

These specialized teeth are in addition to the functional venom glands possessed by the rear-fanged Colubrids. None are believed to be dangerous to humans. Most species are egg eaters, but they also feed on lizards, frogs and small rodents.

They are generally small to medium in size, (usually under 90 cm) innocuous, often move about at night and are most likely to be found on the floor of mature forests. Colour and pattern varies, but is often bright and distinctive.

Hoser (2012a) wrote "There are approximately 70 recognized described species although the exact number isn't certain due to the fact that some described taxa may be synonymous with others and there's no doubt that undescribed forms remain to be named."

Uetz (2013) cited 77 species as of 27 January 2014, with one species "*Oligodon cattienensis* Vassilieva *et al.* 2013" described in 2013. That taxon is most likely properly assigned to the genus *Trileptis* Cope, 1886.

Relying mainly on previously published material as cited in Hoser (2012a), Hoser (2012a) divided the genus *Oligodon* Fitzinger, 1826 into 12 genera and 4 subgenera on the basis of divergent morphological traits and limited genetic analysis.

This was derided as an act of "Taxonomic vandalism" by Kaiser (2012a, 2012b) and Kaiser *et al.* (2013), even though co-authors of the latter paper repeatedly publicly admitted that they had not in fact read the papers they were condemning (Schleip 2013a, Schleip 2013b, Schleip 2013c, Wüster 2013a, Wüster 2013b, Wüster 2013c).

The divisions as proposed by Hoser have in fact been validated by the molecular results of Pyron *et al.* (2013a, 2013b) in terms of the taxa for which they had results. These results effectively rebutted the false and baseless claims of taxonomic vandalism by Kaiser *et al.*

I might also add that Hoser (2012b and Hoser 2013) and sources cited therein also effectively rebutted all the adverse claims against myself and my papers by Kaiser (2012a, 2012b) and Kaiser *et al.* (2013).

The purpose of this paper is not to review the taxonomy of the

Oligodonini or even to provide a summary of the relevant snakes. A detailed list of relevant references was published by Hoser (2012).

The taxon, *Smythkukri annamensis* (Leviton, 1953), (better known to date as *Oligodon annamensis* Leviton, 1953), as defined by Leviton (1953 and 1960), was sufficiently divergent from the rest of the genus to be placed in a then monotypic subgenus *Geddykukrius* Hoser, 2012, which based on comments of Vassilieva *et al.* 2013, was probably too conservative a placement in terms of the phylogenetic position of the taxon. However for the purposes of this paper, I leave the taxon "as is" that being within the genus *Smythkukri* Hoser, 2012, and the subgenus *Geddykukrius* Hoser, 2012.

On 14 June 2013, Thy Neang and Seiha Hun published a paper titled "First record of *Oligodon annamensis* Leviton, 1953 (Squamata: Colubridae) from the Cardamom Mountains of southwest Cambodia" in *Herpetology Notes*, Volume 6, pages 271-273.

Upon reading the paper, it became self-evident that the authors were greatly mistaken in believing that the snake they were describing a distributionally disjunct specimen of the species "*Oligodon annamensis*", better known as *Smythkukri* (*Geddykukrius*) *annamensis* (Leviton, 1953).

The authors had in fact in effect published a very good description of a new species of snake without actually realizing it.

Therefore it is with great pleasure that I am able to formally name a second species, morphologically similar to *Smythkukri annamensis* (Leviton, 1953), within the same subgenus via the description published herein.

The new taxon *Smythkukri hunneangorum* described according to the Zoological Code (Ride *et al.* 1999) is from the Cardamom Mountains of southwest Cambodia. It is named in honour the original collectors Thy Neang and Seiha Hun both of Phnom Penh, Cambodia.

These people have quite evidently done all the materially relevant work on the taxon, both before and after its collection and therefore should be appropriately recognized by having the snake named in their honour.

I might add that in terms of the conservation of global biodiversity, it matters little as to who actually names it, but more importantly that it is named, named correctly and named expediently and before it may become extinct.

Taxonomy and nomenclature is of course the basic infrastructure upon which all other zoological disciplines are based.

SMYTHKUKRI (GEDDYKUKRIUS) HUNNEANGORUM SP. NOV.

Holotype: Specimen number CBC 01899, held at the Centre for Biodiversity Conservation, Room 415, Faculty of Science, Royal University of Phnom Penh, Confederation of Russian Boulevard, Phnom Penh, Cambodia, having been collected in the Phnom Samkos Wildlife Sanctuary of the Cardamom Mountains in southwest Cambodia, Lat. 12.2713° N, Long. 102.9767° E.

The Centre for Biodiversity Conservation is a government funded facility that allows access to specimens by scientists.

Diagnosis: This species, *Smythkukri hunneangorum sp. nov.*, has until now been treated as a variant of *S. annamensis* (Leviton, 1953), (better known to date as *Oligodon annamensis* Leviton, 1953), as defined by Leviton (1953 and 1960). However it is separated from that taxon by any of the following suite of characters:

One/ 1+1 temporals (TP), (vs.1+2); Two/ ratio of TL/SVL higher, 0.230 vs. 0.132-0.211; Three/ fewer ventral scales (VS), 148 vs. 159-170; and Four/ slightly more subcaudal scales (SC), 46 vs. 30-44.

The holotype specimen is described in detail by Neang and Hun (2013).

In light of the discovery of the new species *Smythkukri hunneangorum sp. nov.* the subgenus *Geddykukrius* Hoser, 2012 is herein redefined and redescribed as follows: It separated from all other species within the genus *Smythkukri* Hoser, 2012 by the following suite of characters: Dominant dorsal colour brown, sometimes greyish-brown on the sides or flanks, scales often darker edged and with fine dark flecks. Head markings are black-edged white blotches. Instead of ocular and temporal bars, there are whitish marks in front and behind the eye, meeting just above the eye, but not confluent across the top with those from the other side (*S. annamensis*) or alternatively confluent across the top with those from the other side (*S. hunneangorum sp. nov.*). Thin whitish chevron marks extend from the neck to the parietals, but may or may not be confluent with a spot there. Body with approximately 10, more or less distinct, black-edged white crossbars or alternatively with 20 orangeish-coloured crossbands, each second one being indistinct. A white spot on the tip of the tail. Ventral colour white with black quadrangular spots, some confluent across the ventrals. Nasal undivided or partially divided. Two internasals. No loreal. One postocular. Temporals 1+1 or 1+2. Six supralabials, third and fourth in contact with eye. Six infralabials. 13 dorsal midbody rows, 148-170 ventrals, laterally angulate. Anal single. Subcaudals 30-46. Eight maxillary teeth. The hemipenis is deeply forked with thin papillae present, extending half the length of the fork and no spines.

Distribution: Currently known only from the Phnom Samkos Wildlife Sanctuary of the Cardamom Mountains in southwest Cambodia. By contrast, *S. annamensis* is only known from the type

locality at "Blaos, Haut Donai", currently Bao Loc, Lam Dong Province, South Vietnam, approximately 607 km east of the Cambodian locality for *S. hunneangorum sp. nov.*

These locations also form the entire distribution for the subgenus *Geddykukrius* Hoser, 2012.

Comments: The collection localities of both *S. hunneangorum sp. nov.* and *S. annamensis* (Leviton, 1953) are widely separated by a region of unsuitable alluvial lowland habitat, this being the Mekong and Tonle Sap River valleys and nearby flatlands. Using a measurement of suitable habitat types to allow the populations to meet, including via the more northerly Dang Rek Scarp would more than double the relevant distance and include both relatively well-collected locations and still include shorter areas of unsuitable habitat using the most logical route of connection. The apparent absence of specimens of either taxon (regardless of how they are identified) in any of these areas to date shows quite emphatically that the two populations have been disjunct for an extremely long period of geological time and more than enough to have developed into different species.

The morphological traits relied upon to differentiate the two taxa are also very conservative and as a rule only change over extended periods of geological time. Hence the relevant snakes clearly form two distinct biological entities.

Therefore I had no hesitation in describing *S. hunneangorum sp. nov.* as a new species level taxon.

I might also add that both *S. hunneangorum sp. nov.* and *S. annamensis* (Leviton, 1953) are confined to high rainfall pockets of hills and these are broken by a wide region (from all sides) of drier lowlands habitat.

Suitable high rainfall habitat probably only existed in the intervening region more than 2.6 million years ago (see for example Gribbin 1982), meaning that the populations of *S. hunneangorum sp. nov.* and *S. annamensis* (Leviton, 1953) have been divergent for at least that long, and quite possibly considerably longer.

Etymology: Named in honour of Thy Neang and Seiha Hun who collected the original type specimen and also then published the details of the fact that alerted me to this unnamed taxon.

CONFLICT OF INTEREST

This author reports no conflict of interest in terms of any material within this paper.

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New snake taxa from Australasia, Asia and Africa.

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ABSTRACT

Following on from many years of field and laboratory study as well as a review of relevant publications, taxa of snakes from the Australasian region and Africa have their current classifications re-arranged to better reflect their morphological differences and phylogenies.

Where appropriate, new taxa are formally described according to the Zoological Code (Ride *et al.* 1999) for the first time.

Included within this paper are the following actions:

Two new species of the Australian genus *Cacophis* Günther, 1863, are formally described and named.

The genus *Cacophis* is also divided in two using available names, each group conservatively placed into subgenera, namely *Cacophis* and *Petrodymon* Krefft, 1866.

The genus *Cryptophis* Worrell, 1961 is also divided three ways into subgenera, two being formally named for the first time.

The Misima Island *Charlespiersonserpens*, until now assigned to the species *Charlespiersonserpens* (*Charlespiersonserpens*) *salomonis* (Günther, 1872) is herein formally described as a new species.

Species within the genus *Chrysopelea* Boie, 1826 are divided into obvious geographical groups; the result being one subspecies elevated to full species and five new subspecies formally named for the first time.

The Halmahera Islands Reticulated Python *Broghammerus reticulatus* (Schneider, 1801) is formally described as a new subspecies.

The genus *Aparallactus* Smith, 1849 as defined by Hoser in 2012 is further divided, with the transfer of the species *Aparallactus jacksonii* (Günther, 1888) to a genus formally named for the first time.

Keywords: Taxonomy; Australasia; Asia; Africa; *Cacophis*; *Petrodymon*; *Cryptophis*; *Chrysopelea*; *Aparallactus*; *Broghammerus*; *Malayopython*; *squamulosus*; *churchilli*; *krefftii*; *harriettae*; *jacksonii*; *reticulatus*; new genus; *Snowdonus*; new subgenera; *Macconchieus*; *Lukefabaus* new species; *scanloni*; *sheai*; *charlespiersoni*; new subspecies; *ghatsiensis*; *caerulea*; *johorensis*; *borniensis*; *tepedeleni*; *mandella*.

INTRODUCTION

In the period culminating end 2012, I did an audit of the world's snakes to identify unnamed genera, with an emphasis on those easily identified on the basis of existing published material and the strongest of scientific evidence. This evidence was usually both morphological and molecular. In some cases direct molecular evidence was unavailable, but easily inferred based on molecular studies of other reptiles constrained in distribution by the same habitats and geographical barriers within regions, allowing me to accurately infer divergence times.

Alternatively sound geological evidence allowed me to make similar accurate judgements.

While the audit was not exhaustive as such, I did with reasonable confidence, identify and name the majority of obvious unnamed snake genera on the planet, this being groups for which names were not available at the time according to the Zoological Code (Ride *et al.* 1999).

Some groups of snakes required further inspection and analysis and there is no doubt that there remain unnamed genera of

snakes that I have in fact missed, overlooked or bypassed in the absence of sound data.

I estimate between 10 and 30 unnamed genera of snakes left on the planet using currently recognized and used criteria for defining snake genera, for which there are not available names. There is a significantly greater number of unrecognized genera for which there are available names in accordance with the Zoological Code (Ride *et al.* 1999), many of which I identified in papers published in the period 2012, 2013 as listed on the Zoobank database (all within issues 10-21 of *Australasian Journal of Herpetology*).

At the same time numerous unnamed species were identified, of which some were formally identified and named and others were not.

Of those that weren't, these were usually not named on the basis that other herpetologists had indicated to me that they were seeking to name these taxa themselves.

A small number of taxa were not named on the basis I required

further evidence of proof that they were in fact taxonomically distinct and therefore in need of nomenclatural recognition.

The snake taxa described within this paper include some of those of which I was aware of in 2012 (or earlier) and held over naming for one or more of the reasons outlined above and have yet to be named.

Due to the ongoing need to catalogue biodiversity as soon as practicable, relevant taxa are described for the first time herein. In terms of placements of taxa within the zoological system of nomenclature, each taxonomic unit has been treated with conservatism in mind. That is, at the lowest level of recognition possible on the basis of available evidence.

I note also the following. In 2006 an online petition sponsored by a group of animal-hating pseudoscientists including Wolfgang Wüster, Mark O'Shea, David John Williams, Bryan Fry and others posted at: <http://www.aussiereptileclassifieds.com/phpPETITION> (Hunter *et al.* 2006) called for my successful wildlife education business and all my other herpetological activity to be shut down by the government of Victoria, Australia. These men were successful in that after a ruthless five-year campaign, on 17 August 2011, 11 heavily armed police and wildlife officers conducted a highly illegal and violent raid on our family home and research facility. Myself, my wife and two young daughters were arrested at gunpoint and held captive in the kitchen of the house for nine hours while the facility was ransacked. Besides the unspeakable acts of killing captive snakes and criminal damage to cages, household goods, the raiding officers illegally shut down our business and effectively placed myself under house arrest at gunpoint for some months after the raid.

An application by myself to the Supreme Court of Victoria led to the re-opening of our unlawfully shut down wildlife education business.

Of greater relevance here is that at the time of the raid, research files spanning more than 40 years were taken and never returned, including materials and records relevant to this paper.

Material taken included all the computers, disks, hard drives, backups, cameras, scientific literature and other forms of information storage at the facility. All were loaded into the back of a truck and trailer and carted off.

Faced with the dilemma of deciding whether to spend another forty years gathering data, by which time I may be dead from old age, being aged 52 as of 2014, or publishing the relevant paper/s with less than optimal data, I have opted to publish. Underlying this motivation has been an increasing concern that a delay to formally identify and name undescribed biodiversity may lead to its extinction before another scientist gets around to the matter.

Engstrom *et al.* (2002) wrote: "The documentation of this diversity must be seen as an activity that is done not just for posterity but for immediate action and protection."

A number of authors including Kaiser (2012a, 2012b, 2013 and 2014), Kaiser *et al.* (2013), Naish (2013) and Wüster *et al.* (2014), all part of the group of people effectively controlled by Wüster, have been highly critical of the fact that I have assigned names to unnamed clades of snakes. Their unscientific and childish attacks, continued incessantly on social media such as Facebook and Twitter are rejected herein as destabilizing the nomenclature and impeding the progress of science.

Their ridiculous comments and false and defamatory statements are systematically rebutted by Hoser (2013).

I also note that many taxa formally named by myself for the first time in earlier publications (e.g. Hoser 2000a, 2000b) are in fact threatened species.

Therefore I note the sensible remarks of Engstrom *et al.* (2002) as a perfectly reasonable explanation for the publishing of taxon descriptions for such unnamed groups. This remains the case even if a sizeable amount of my original research, files, photos and data have been stolen and therefore cannot be relied upon

and incorporated into these contemporary publications.

CACOPHIS GÜNTHER, 1863.

One genus that should be divided, at least to subgenera is the Australian genus *Cacophis* Günther, 1863. The most divergent species in that genus, *Cacophis squamulosus* (Duméril, Bibron and Duméril, 1854), can be placed in the available genus (or subgenus) *Petrodymon* Krefft, 1866.

While there have been arguments against the use of monotypic genera, which incidentally I do not agree with, the description of a new species formerly confused with *Cacophis squamulosus* (Duméril, Bibron and Duméril, 1854), does in fact give this lineage (or clade) within the greater *Cacophis* two species.

Hence I use the subgeneric placement herein.

CACOPHIS (PETRODYMON) SCANLONI SP. NOV.

Holotype: Specimen number R115255 at the Australian Museum, Sydney, Australia. It was collected in the vicinity of the last 2.7 km of Chelmans Rd, Clarke Range, north of Eungella, Queensland, Australia, Lat: 21 deg 01 min S, 148 deg 33 min E. by Allen E. Greer on or about 4 October 1984.

The Australian Museum in Sydney, Australia is a government-owned facility that allows scientists access to its research collections.

Paratypes: Specimen numbers R47779 collected from Eungella, Queensland, Australia and R47915 collected from Mount William, Via Eungella, Queensland, Australia, respectively, both held at the Australian Museum in Sydney, Australia. The Australian Museum in Sydney, Australia is a government-owned facility that allows scientists access to its research collections.

Diagnosis: Until now this taxon has been treated as the Golden-Crowned Snake, *Cacophis squamulosus* (Duméril, Bibron and Duméril, 1854). However after more than 30 years of capturing and viewing many hundreds of specimens from all parts of the known range of *C. squamulosus* as defined until now, obvious north-south differences were apparent to me.

When these were quantified, the population from the Eungella Rainforests and immediately adjacent areas were seen to be different from those south of a dry zone known as the St. Lawrence Gap, that separates the northern populations from those further south.

The northern taxon, *Cacophis scanloni* sp. nov., is most readily separated from *C. squamulosus* by colour. In both species there is a large blackish patch below the eye and running to it from the suture of the mouth. That is across one or more upper labials.

The blackish patch varies in shape in specimens and is somewhat irregular in shape, also varying in size and shape geographically and by individual specimens. However in *C. squamulosus* this patch is consistently and distinctively wider than high. By contrast in *Cacophis scanloni* sp. nov. the patch is consistently and distinctively noticeably higher than wide.

Furthermore if one were to compare specimens of each taxon side by side, one finds the blackish patch considerably smaller in *Cacophis scanloni* sp. nov. than seen in *C. squamulosus*. In *C. squamulosus* there is considerable darkening on the lower margin of the upper labials posterior to the dark patch. This is not seen in *Cacophis scanloni* sp. nov..

A further consistent difference between the two species is in dorsal colouration. *Cacophis scanloni* sp. nov. is a medium to light brown in dorsal colouration, versus a dark to chocolate brown in *C. squamulosus*.

The orangeish venter is similar in intensity in both species.

The northern taxon, *Cacophis scanloni* sp. nov. is known only from the immediate vicinity of the Eungella and nearby rainforests and is separated from *C. squamulosus* by the dry zone known as the St. Lawrence Gap. *C. squamulosus* only occurs south of there and more-or-less continuously along the coast and nearby wet ranges into southern NSW, encompassing the region of the coastal strip and nearby ranges.

While there have been no molecular studies of the species *Cacophis scanloni* sp. nov. and *C. squamulosus* at the same time and place using mtDNA or nuclear DNA, the divergence times of the two forms is easily ascertained.

The study by Chapple *et al.* (2011) of the species complex *Allengreerus delicata* (identified by them as being within the genus *Lampropholis*) shows that the specimens from the Eungella bioregion diverged from the specimens south of the St. Lawrence Gap more than five million years ago.

Like snakes of the genus *Cacophis*, the skinks within *Allengreerus* are usually restricted to wet forests and similar (Hoser, 2009, 2012a), although they are not as heavily constrained to the wetter habitats as are *Cacophis* (Hoser 1989). This in effect means that the divergence time for the skinks must be taken as the minimum likely divergence estimate for the snakes.

With both north and south populations of what were until now known as *C. squamulosus* clearly being allopatric and widely separated, morphologically distinct and likely to be easily differentiated by molecular means, and there is no cross-breeding in the wild, they form two distinct species by any reasonable interpretation of the term.

Therefore I had no hesitation whatsoever in formally describing the northern population as *Cacophis scanloni* sp. nov..

As an aside, the same molecular data provides further support for the continued recognition of the species level taxon *Tropidechis sadleri* Hoser, 2003, a species formerly regarded as conspecific with *T. carinata* (Krefft, 1853) (Hoser 2003).

Distribution: *Cacophis scanloni* sp. nov. is confined to the wet forests in the general vicinity of Eungella, Queensland, Australia.

Etymology: Named in honour of Australian herpetologist John D. Scanlon. While John has publicly made demonstrably false comments in terms of some of my earlier papers, he has also made significant contributions to our knowledge of Australian snakes in a herpetological career spanning many decades. His area of expertise includes snakes of the genus *Cacophis* and so it is fitting that a species within this genus be named in his honour.

CACOPHIS (CACOPHIS) SHEAI SP. NOV.

Holotype: A specimen in the Queensland Museum, number J14287, from Mackay, Queensland, Australia. The Queensland Museum in Brisbane, Australia is a government-owned facility that allows scientists access to its research collections.

Paratype: A specimen in the Queensland Museum, number J34031 from Mackay, Queensland, Australia. The Queensland Museum in Brisbane, Australia is a government-owned facility that allows scientists access to its research collections.

Diagnosis: Similar in most respects to the species *Cacophis krefftii* Günther, 1863, and the more recently described species *Cacophis churchilli* Wells and Wellington, 1985, the latter species being formerly grouped with *C. krefftii* until described by Wells and Wellington.

Until now the species *Cacophis sheai* sp. nov. has been identified by herpetologists as the northernmost population of *C. krefftii*.

In common with *C. krefftii* the ventral surfaces in *Cacophis sheai* sp. nov. are pale yellow with narrow dark bands. By contrast in *C. churchilli* the ventral surfaces are a dark grey colour.

In common with *C. churchilli*, in *Cacophis sheai* sp. nov. there is a large dark patch occupying most of the two labials immediately below the eye that runs into the eye. By contrast in *C. krefftii* the dark section below the eye is separated from it by a distinctive thin white line and/or there is a thin white line that extends from the lower front of the eye, downwards across the labials to the suture of the mouth. There is no such line in *Cacophis sheai* sp. nov.. By contrast in *Cacophis sheai* sp. nov. the whitish patch anterior to the dark pigment on the labials beneath the eye does not reach the front of the eye.

C. churchilli is separated from *Cacophis sheai* sp. nov. and *C. krefftii* by the fact that the whitish pigment anterior to the eyes, in the snout region is heavily peppered, as opposed to being marked with small brown blotches or immaculate in the other two species.

In contrast to both *C. krefftii* and *C. churchilli* the nape in *Cacophis sheai* sp. nov. sometimes extends forwards at the sides to be noticeably wider (up to 5 scales wide), versus three in the other two species.

At the centre of the nape, the width is 2.5-3 scales wide, versus 1.5-2.5 scales wide in *C. churchilli*, less than 2 scales wide in *C. krefftii* and four or more scales wide in *C. harriettae*.

The only other species within the genus *Cacophis* (as presently recognized) is/are *C. squamulosus* Duméril, Bibron and Duméril, 1854, and now *C. scanloni* sp. nov. readily separated from the other species by the orange ventrals, with a distinct mid-ventral line of brown blotches.

The holotype of *Cacophis sheai* sp. nov. was assigned to *C. krefftii* by Scanlon (2003).

Diagnostic of both *Cacophis sheai* sp. nov. and *C. krefftii* is smooth scales, 15 dorsal mid-body scale rows, 140-160 ventrals, divided anal, and 25-40 all divided subcaudals (Hoser, 1989).

Distribution: Known only from the region in the vicinity of Eungella and Mackay, Queensland, Australia.

Etymology: Named in honour of Australian herpetologist Glenn Shea. While Glenn has publicly criticized some of my earlier papers, he has also made significant contributions to our knowledge of Australian reptiles in a herpetological career spanning many decades, including as most recent editor of the Australian journal *Herpetofauna*. Therefore it is entirely appropriate that a species within this genus be named in his honour.

A THREE-WAY DIVISION OF CRYPTOPHIS WORRELL, 1961.

The genus *Cryptophis* has until now been treated largely as a "parking lot" for morphologically similar species, with some species within the genus (e.g. *Denisonia boschmai* Brongersma and Knaap-van Meeuwen 1961), being transferred between several genera previously and with little apparent regard to whether or not the similarities between species more properly reflect recent divergence or convergence in habits.

Noting the extreme morphological conservatism of small land-dwelling elapids, it is clear that *Cryptophis* as currently understood in Australian herpetology is composite when treated at the genus level and it is therefore broken up three ways along the most obvious morphological lines.

In order to maintain ongoing nomenclatural stability and in the absence of sound molecular data to corroborate the obvious physical evidence, each new group is herein defined as a subgenus only.

I had intended doing a similar division of the relatively large genus *Demansia* Günther, 1858, however was recently advised by Richard Wells of NSW that he had a pending publication naming a new division within this genus in honour of his friend Rob Valentic. It is not as important who names given taxa as opposed to that it is properly identified and named and therefore I have no issue to Richard Wells, a herpetologist of many decades standing, having naming rights in terms of unnamed taxa in that group.

A similar situation applies in terms of a southern Queensland species of *Antaioserpens* Wells and Wellington, 1985, a Queensland colubrid and some currently unnamed West Australian blindsnake taxa.

GENUS CRYPTOPHIS WORRELL, 1961.

Type species: *Hoplocephalus pallidiceps* Günther, 1862.

Diagnosis: The genus (*sensu lato*) as defined herein is diagnosed and separated from all other Australian elapid genera by the following suite of characters: dorsal colour may or may

not be uniform, but when not uniform is of the form of a darker vertebral stripe, that may in some specimens extend to the lower flanks of the body; scalation is smooth with 15 dorsal mid-body rows; the frontal is longer than broad, more than one and a half times as broad as the supraocular; supranasals present; anal single; 20-70 all single subcaudals; no subocular scales; two to five small solid maxillary teeth follow the fang on each side. The eye is characteristically small to tiny in size, typically beady in appearance and is usually not, or scarcely wider than the distance of the eye from the margin of the upper lip. The head is more-or-less uniformly coloured and while more or less continuous with the body colour, may be somewhat darker and obviously so in juveniles and young specimens. This colouration is in notable contrast to the so-called hooded snakes of the genus *Parasuta* which are diagnosed by their dark head and brownish coloured neck and body.

The genus *Unechis* Worrell, 1961 is recognized in line with Hoser, 2012c, and notably Wells and Wellington, 1985.

Specimens in that genus are readily separated from *Cryptophis* by the fact that the nasal does not contact the preocular, as shown on page 873 of Cogger (2014). In *Cryptophis (sensu lato)* as defined herein the nasal contacts the preocular.

As a result of the proceeding definition, the only species assigned to *Unechis* Worrell, 1961 on the basis of the preceding is *Unechis boschmai* (Bronngersma and Knaap van Meeuen, 1961).

This includes both Australian and New Guinea forms.

This is a different configuration for the genus as defined by Wells and Wellington (1985) and that of Cogger (2014) who only recognizes *Cryptophis* and has synonymised the genus *Unechis* within *Cryptophis*. Cogger's placement of the species *Hoplocephalus nigrostriatus* Krefft 1864 and *Unechis incredibilis* Wells and Wellington, 1985 within *Cryptophis sensu-lato* is accepted herein, although both these species are herein placed within a newly named subgenus.

Wells and Wellington (1985) treated both *Hoplocephalus nigrostriatus* Krefft 1864 and *Unechis incredibilis* Wells and Wellington, 1985 as being within *Unechis* but did not formally define the genus within their paper.

This was copied by Hoser (2012c), but on the basis of the above, these two species are treated herein as being within a subgenus of *Cryptophis*.

As already indicated herein, neither taxon fit within the genus *Unechis* as defined herein.

Distribution: Wetter parts of eastern Australia, northern Australia and New Guinea.

Content: *Cryptophis pallidiceps* (Günther, 1858) (type for genus); *C. assimilis* (Macleay, 1885); *C. durhami* (Hoser, 2012); *Cryptophis edwardsi* Hoser, 2012; *C. incredibilis* (Wells and Wellington, 1985); *C. nigrescens* (Günther, 1862); *C. nigrostriatus* (Krefft, 1864).

MACCONCHIEUS SUBGEN. NOV.

Type species: *Hoplocephalus nigrostriatus* Krefft 1864

Diagnosis: The subgenus *Macconchieus subgen. nov.* is readily separated from other *Cryptophis* species (both other subgenera) by being predominantly pink or reddish above as opposed to being more-or-less uniformly dark black or dark brown above. When there is a distinct black, dark grey or brown vertebral stripe along the length of the body, this line does not extend so wide as to encroach the lower flanks of the sides (as seen in the subgenus *Cryptophis*).

The subgenus *Macconchieus subgen. nov.* is further diagnosed by the possession of 160-190 ventrals and 45-70 all single subcaudals, as opposed to less than 45 in *Lukefabaus subgen. nov.* formally named below.

The subgenus *Cryptophis* is further separated from the other subgenera by the presence of a distinct pale patch on the top of the head between the anterior edge of the frontal shield and the

posterior edge of the parietal shields. This is not seen in the other subgenera.

While all *Cryptophis* subgenera have small eyes, those within *Lukefabaus subgen. nov.* are noticeably the smallest, appearing pin-like in form and giving these snakes their common name "small-eyed snake".

Distribution: Eastern Queensland, most commonly found in drier forested and hilly areas, as well as nearby parts of southern New Guinea.

Etymology: Named in honour of Donvale, Melbourne, Victoria, Australia, based lawyer Lachlan McConchie for his services to wildlife conservation including in 2013 defending several people wrongly charged by corrupt government wildlife officials for rescuing supposedly protected wild ducks, illegally shot by fauna officers acting outside of the very rules they were supposed to be enforcing.

Lawyers as an occupational group, do have a terrible reputation, but Mr. McConchie is one of those who stands well outside of this stereotype.

Content: *Cryptophis (Macconchieus) nigrostriatus* (Krefft, 1864); *C. (Macconchieus) durhami* (Hoser, 2012); *C. (Macconchieus) incredibilis* (Wells and Wellington, 1985).

LUKEFABAUS SUBGEN. NOV.

Type species: *Hoplocephalus nigrescens* Günther, 1862.

Diagnosis: All species in the subgenus *Lukefabaus subgen. nov.* are readily separated from the other subgenera of *Cryptophis* and similar Australian elapid genera by the fact that the head and body is more-or-less a uniform black or dark grey above, including a head that is a uniform colour in line with the body colour. In newborn snakes and immature specimens, the head may appear blackish and the body slightly lighter in overall colour.

The subgenus *Macconchieus subgen. nov.* is readily separated from other *Cryptophis* species (both other subgenera) by being predominantly pink or reddish above as opposed to being more-or-less uniformly dark black or dark brown above. When there is a distinct black, dark grey or brown vertebral stripe along the length of the body, this line does not extend so wide as to encroach the lower flanks of the sides (as seen in the subgenus *Cryptophis*).

The subgenus *Macconchieus subgen. nov.* is further diagnosed by the possession of 160-190 ventrals and 45-70 all single subcaudals, as opposed to less than 45 in *Lukefabaus subgen. nov.* formally named here.

The subgenus *Cryptophis* is further separated from the other subgenera by the presence of a distinct pale patch on the top of the head between the anterior edge of the frontal shield and the posterior edge of the parietal shields.

While all *Cryptophis* subgenera have small eyes, those within *Lukefabaus subgen. nov.* are noticeably the smallest, appearing pin-like in form and giving these snakes their common name "small-eyed snake".

Lukefabaus subgen. nov. have a venter that may range from immaculate white, through shades of pink, orange or red, with or without other flecks, lines or markings on the background. This character varies both between individual snakes, with age and between species.

Distribution: Wetter parts of eastern Queensland, commencing at Cape York and then running south through eastern NSW into Victoria. Not known from Tasmania or New Guinea. The three described species appear to be allopatric.

Etymology: Named in honour of Doncaster, Melbourne, Victoria, Australia, based lawyer Luke Faba for his services to wildlife conservation and public safety including in 2013 successfully taking action against serial police-protected criminals and trademark bootleggers who were ripping off the registered Snakebusters trademarks and putting innocent lives at risk with their reckless actions via their own unsafe wildlife displays.

It is those people who have no respect for IP laws, the rules of zoological nomenclature and ethics in general who pose a serious long-term threat, not just to herpetology, but wildlife conservation in general.

Content: *C. (Lukefabaus) nigrescens* (Günther, 1862) (type species); *C. (Lukefabaus) assimilis* (Macleay, 1885); *C. (Lukefabaus) edwardsi* Hoser, 2012.

A NEW CHARLESPIERSONSERPENS SPECIES

There is no doubt at all that a number of species of tree snakes within the genera *Dendrelaphis* Boulenger, 1890, and *Charlespiersonserpens* Hoser, 2012 await formal description.

One of the more obvious undescribed species is formally described below according to the Zoological Code (Ride *et al.* 1999).

CHARLESPIERSONSERPENS

(CHARLESPIERSONSERPENS) CHARLESPIERSONI SP. NOV.

Holotype: A male specimen, number AMNH 76691, from Misima Island, Milne Bay Province, Papua New Guinea, held at the American Museum of Natural History, New York, USA. The American Museum of Natural History, New York, USA is a government-owned facility that allows scientists access to its research collections.

Paratypes: Specimen numbers AMNH 76693 (a male), AMNH 76692 and AMNH 76694 (both females) from Misima Island, Milne Bay Province, Papua New Guinea, held at the American Museum of Natural History, New York, USA. The American Museum of Natural History, New York, USA is a government-owned facility that allows scientists access to its research collections.

Diagnosis: Previously this taxon was regarded as a variant of *Charlespiersonserpens* (*Charlespiersonserpens*) *salomonis* (Günther, 1872), listed in most recent literature as *Dendrelaphis salomonis* (Günther, 1872) (e.g. McDowell 1984).

In the normal course of events, the species *C. charlespiersoni* sp. nov. would key out as *C. salomonis*.

However *C. charlespiersoni* sp. nov. is most readily separated from *C. salomonis* in the field or as a corpse by its melanistic dorsal colouration, which is not a trait seen in *C. salomonis*.

C. charlespiersoni sp. nov. is diagnostically separated from *C. salomonis* by the presence of 28-29 maxillary teeth (longest posteriorly) in each maxilla, versus just 21 in the species *C. salomonis*.

C. charlespiersoni sp. nov. lacks the conspicuous sensory pits seen in the side of the head of *C. salomonis*.

C. charlespiersoni sp. nov. is characterized by 178-179 ventrals in males and 189-191 in females, a count similar to that for *C. salomonis*.

C. charlespiersoni sp. nov. and *C. salomonis* have similar hemipenial structure.

Distribution: *C. charlespiersoni* sp. nov. is known only from Misima Island, Milne Bay Province, Papua New Guinea. This is a known distribution mutually exclusive of the taxon *C. salomonis*.

Etymology: Named in honour of the esteemed Australian publisher Charles Pierson. See the detailed etymology in Hoser (2012b) for *Charlespiersonserpens* Hoser (2012).

CHRYSOPELEA BOIE, 1826.

Hoser (2013a), divided the genus as widely recognized into two. The subgenus *Wellsserpens* Hoser, 2013 was erected to accommodate the divergent taxon *Chrysopelea taprobanica* Smith, 1943, noting herein there is strong evidence presented by Hoser 2013a to consider the placement of *C. taprobanica* into its own genus.

The remaining species within the genus *Chrysopelea* have long been known to have regionally divergent forms (Boulenger, 1890) and it is with some surprise that some of the better known

ones have not yet been formally named.

Hence this is done herein.

Chrysopelea ornata (Shaw, 1802) is herein divided into two species. While the holotype for "*Coluber ornatus* Shaw, 1802" has been lost, it is clear from the written description that the taxon described is the form known as the race found from north-east India throughout south-east Asia in the region bound by China in the east and Peninsula Malaysia in the South. This also means that the taxon name *Chrysopelea ornata ornatissima* Werner, 1925 is a junior synonym for *C. ornata*, meaning it is no longer recognized by this author.

The better-known form of the species until now known as *Chrysopelea ornata* is that with the red dorsal markings in alternate light cross-bands that is found in Sri Lanka and the Western Ghats of India. The available name for this form is *Chrysopelea ornata sinhaleya* Deraniyagala, 1945 herein elevated to a full species.

The specimens from the Western Ghats of India, while morphologically similar, do have consistent phenotypic differences and are therefore named herein as a new subspecies of *C. sinhaleya* Deraniyagala, 1945.

The very distinct bluish form of *C. ornata* from the Con Dao Archipelago, Vietnam, is formally described herein as a new subspecies based on consistent colour and scalation differences to the nominate form.

The species *Chrysopelea paradisi* Boie, 1827 has long been known to be regionally variable. Three recognized forms have been described to date, these being those from Java (the nominate form), the Philippines form and another from Sulawesi. Herein are described the forms from Borneo, Sumatra and mainland South-east Asia, each named herein as subspecies.

CHRYSOPELEA ORNATA CAERULEA SUBSP. NOV.

Holotype: A specimen at the United States National Museum, Vertebrate Zoology; Amphibians and Reptiles collection, specimen number: 165065 (one animal), collected at Little Hon Tre Island, Con son Islands. The United States National Museum is a public facility that allows inspection of specimens by scientists.

Diagnosis: This subspecies is readily differentiated in life from the nominate form (*C. ornata ornata*) by the overall bluish hue of specimens versus greenish or yellow in the nominate form. As well as being the only form of *C. ornata* found in its known range the Con Dao Archipelago, Vietnam, there is little possibility of either this form *C. ornata caerulea* subsp. nov. or *C. ornata ornata* being confused.

It is only the absence of molecular data that I hesitated in describing this form as a full species, the most obvious differences being in colour, but these differences being supported by consistent scalation differences as well.

C. ornata caerulea subsp. nov. is further separated from *C. ornata ornata* by having nine as opposed to ten upper labials, three post oculars as opposed to two, no yellow etching above the eye, instead being mainly black, with limited bluish flecks and mainly black in the upper parts of the first four upper labials, as opposed to only limited dark colour in the upper parts of the first four upper labials in *C. ornata ornata*.

In *C. ornata caerulea* subsp. nov. the light (bluish) patch in front of the eye is more than twice as long (high) as wide, versus less than twice as long (high) as wide for the light (yellowish or green) patch in front of the eye in the nominate form.

In *C. ornata caerulea* subsp. nov. the lower labials and underside of the head are immaculate white, versus yellowish or greenish in the nominate form, or where whitish, with a distinct colour tinge.

C. ornata caerulea subsp. nov. has an immaculate aqua blue belly, being most rich in hue at the rear end of the body. At the tail end, posterior to the venter, black markings from the flanks also appear on the venter.

By contrast *C. ornata ornata* has a yellowish or green venter. Dorsally *C. ornata caerulea subsp. nov.* presents as an aqua-coloured snake with blackish throughout.

Distribution: Known only from the type locality area of the Con Dao Archipelago, Vietnam.

Etymology: Named in reflection of the overall colour of specimens in life (blue).

CHRYSOPELEA SINHALEYA GHATSIENSIS SUBSP. NOV.

Holotype: A specimen at the California Academy of Science (CAS), specimen number: 17257 from Malabar, Kerala, India. The California Academy of Science is a facility that allows public access to its specimens.

Paratype: A specimen at the California Academy of Science (CAS), specimen number: 17256 from Malabar, Kerala, India. The California Academy of Science is a facility that allows public access to its specimens.

Diagnosis: *Chrysopelea sinhaleya ghatsiensis subsp. nov.* is in most respects identical to the nominate form *C. sinhaleya sinhaleya* from Sri Lanka (until now usually referred to as *C. ornata sinhaleya*). It is however separated from the latter both in the field and the laboratory by the following external characters: a slight darkening of the center of the upper labials (not so in the Sri Lanka form) and the fifth labial ends directly under eye as opposed to slightly anterior to the middle of the eye in the Sri Lanka form.

Distribution: Known from the Western Ghats of India only. Specimens reported from scattered locations in the Eastern Ghats are also likely to be of this subspecies.

Etymology: Named in reflection of the type locality and the region the subspecies comes from.

CHRYSOPELEA PARADISI BORNIIENSIS SUBSP. NOV.

Holotype: Specimen number: R-8440 at the Museum of Comparative Zoology (MCZ), Harvard University, USA, collected from Sadong district, Sarawak Borneo, Indonesia. This is a facility that allows access to specimens by scientists.

Paratypes: Specimen number: R-8439 and R-8441 at the Museum of Comparative Zoology (MCZ), Harvard University, USA, collected from Sadong district, Sarawak Borneo, Indonesia. This is a facility that allows access to specimens by scientists.

Diagnosis: This subspecies is readily separated from all previously described forms of *C. paradisi* and those described herein (this paper) by the following suite of characters: The first three unbroken dorsal crossbars behind the head are whitish in colour, and the two dorsal whitish cross-bars anterior to the eye-line are u-shaped.

Etymology: Named in reflection of the type locality.

CHRYSOPELEA PARADISI JOHORENSIS SUBSP. NOV.

Holotype: Specimen number ZRC.2.3604 at the Raffles Museum of Biodiversity Research, renamed the Lee Kong Chian Natural History Museum on 1 April 2014, Singapore, the specimen being from Johore, Johor, (Peninsula) Malaysia (SV 68.5 cm, TL 92.5 cm). This is a facility that allows access to specimens by scientists.

Paratype: Specimen number ZRC.2.3608 at the Raffles Museum of Biodiversity Research, renamed the Lee Kong Chian Natural History Museum on 1 April 2014, Singapore, the specimen being from Penang, (Peninsula) Malaysia (SV 48.0 cm, TL 64.5 cm). This is a facility that allows access to specimens by scientists.

Diagnosis: This subspecies is readily separated from all previously described forms of *C. paradisi* and those described herein (this paper) by the following suite of characters: The two dorsal whitish cross-bars anterior to the eye-line are not u-shaped, although the posterior of the two does angle forward in the midsection as compared to where it leaves the eyes. The characteristic dark anterior bars and markings are invariably

speckled with yellow or orange spots.

Distribution: Peninsula Malaysia, including Singapore and adjoining parts of countries immediately to the north, these being Thailand, Vietnam, and Burma, including immediately adjacent offshore islands.

Etymology: Named in reflection of the type locality.

CHRYSOPELEA PARADISI TEPEDELENI SUBSP. NOV.

Holotype: Specimen number 59918 at the University of Colorado Museum of Natural History (UCM), USA, collected from near Curup, Sumatra, Indonesia. This is a facility that allows access to specimens by scientists.

Diagnosis: This subspecies (*C. paradisi tepedeleni subsp. nov.*) is readily separated from all previously described forms of *C. paradisi* and those described herein (this paper) by the following suite of characters: The possession of a yellow head, and the dorsal yellow lines behind eye-line form a pair of distinct broken ocelli. Where such ocelli occur in *C. paradisi johorensis subsp. nov.*, they are invariably speckled with yellow or orange spots, which is not seen in this subspecies.

Distribution: Sumatra including immediately adjacent offshore islands.

Etymology: Named in honour of the collector of the type specimen of this subspecies, Kamuran Tepedelen in recognition of his many contributions to the herpetology of the south-east Asian region.

BROGHAMMERUS HOSER 2004.

When I first erected the genus *Brogammerus* in 2003/2004 for the morphologically divergent Reticulated Pythons, most sensible herpetologists agreed with my decision. This of course included the *Victorian Association of Amateur Herpetologists* who courageously published the relevant paper (Hoser, 2004) in spite of ongoing threats and harassment from criminals Wolfgang Wüster, Mark O'Shea and others (see Hoser 2013c for details).

Following publication of the paper (Hoser, 2004), Wüster *et al.* used various unethical methods to stop others using the name (as outlined in Hoser 2012e and 2013c). However I might add that none of these actions had any ethical or scientific basis.

In 2008, Leslie Rawlings and others used newly available technology in the form of mitochondrial DNA studies to affirm that *Brogammerus* was in fact generically distinct from the other python genera (confirmed by Pyron *et al.* 2013) and hence encouraged others to use the validly assigned name.

As a result of Rawlings *et al.* (2008), the name came into widespread usage.

More recently in 2012 and 2013, as the Wüster gang became increasingly desperate in their futile attempts to stop other scientists using correct taxonomy and nomenclature, they published a series of so-called papers encouraging others to violate the rules of Zoological Nomenclature and rename all Hoser-named taxa (Kaiser 2012a, 2012b, and Kaiser *et al.* 2013) as well as numerous internet hate posts as listed by Hoser (2013c).

At end 2013, Reynolds *et al.* published an online paper renaming the genus *Malayopython*. The name is not nomenclaturally valid because it is a junior synonym of *Brogammerus* (same type species) and therefore should not be used. Also their online paper appeared in three different online versions (Reynolds *et al.* 2013a, 2013b and 2014), meaning it didn't comply with Article 8:1:3 of the code in that it was not published in accordance with the code.

Article 8:1:3 reads as follows:

"8.1.3. it must have been produced in an edition containing simultaneously obtainable copies by a method that assures numerous identical and durable copies."

To justify their rule-breaking actions Reynolds *et al.* cited Kaiser *et al.* (2013), better known as Wüster *et al.*, which had called for

a mass breaking of the rules of Zoological Nomenclature with a view to creating taxonomic and nomenclatural chaos, an action condemned by Shea (2013a, 2013b, 2013c, 2013d), Cogger (2013, 2014) and others.

Reynolds *et al.* went further and also made a false claim that *Brogammerus* was a “*nomen nudem*”.

However a read of the original paper Hoser (2004) finds that this was not the case.

Furthermore, “*nomen nudem*” is defined in the code as follows: “A Latin term referring to a name that, if published before 1931, fails to conform to Article 12; or, if published after 1930, fails to conform to Article 13.”

Article 13 reads:

“Article 13. Names published after 1930.

13.1. Requirements. To be available, every new name published after 1930 must satisfy the provisions of Article 11 and must 13.1.1. be accompanied by a description or definition that states in words characters that are purported to differentiate the taxon”.

As the diagnosis for *Brogammerus* in 2004 does this, the claim by Reynolds *et al.* is both fanciful and reckless.

In other words, the claims by Reynolds *et al.* are false and known by them to be and they have therefore been guilty of a case of extreme reckless taxonomic vandalism.

Hence the name *Brogammerus* is the appropriate genus name for the Reticulated Pythons and *Malayopython* is not to be used.

In terms of the other significant part of the paper (Hoser 2004), the Wüster gang have had great success in stopping others from using the subspecies names for regional variants of Reticulated Pythons as first formally proposed at the time.

As private hobbyists in particular have gained greater access to variants of known locality, the stopping of people using correct subspecies names to identify these animals is looking increasingly ridiculous as explained in Hoser (2013b).

One of the obvious subspecies not formally named by Hoser (2004) was that from Halmahera, which is morphologically similar in many respects to that form from Ambon and Ceram (namely *B. reticulatus dalegibbonsi*).

So as to stabilize the nomenclature sooner rather than later, that taxon is formally described below according to the Zoological Code (Ride *et al.* 1999).

BROGHAMMERUS RETICULATUS MANDELLA SUBSP. NOV.

Holotype: A specimen at the US National Museum (USNM), Washington, DC, specimen number 215933 from Halmahera, Indonesia. The USNM is a government-controlled facility that allows access to specimens by scientists.

Paratypes: Specimens at the US National Museum (USNM), Washington, DC, specimen numbers 237101, 237664, 215930, 215931, 215932, 215934, 215935, 215936 from Halmahera, Indonesia. The USNM is a government-controlled facility that allows access to specimens by scientists.

Diagnosis: *Brogammerus reticulatus mandella subsp. nov.* and *B. reticulatus dalegibbonsi* are separated from all other *B. reticulatus* by colouration of the head. In these two subspecies there is a distinct midline stripe on the head and neck, black in colour that is approximately 2/3 of a scale width, and the rest of the dorsal surface of the head is brownish in colour, with a darkening of the region of scales towards the snout. At the rear of the skull and dorsally are two well-spaced black dots about one scale wide, the first about one scale from the mid-dorsal line and the second about 4 scales further across the head. There are dark markings on the side of the head in the form of a stripe from the rear of the eye to the lower part of the head.

In these subspecies and the Timor subspecies (*B. reticulatus patrickcouper*), this stripe is noticeably irregular in thickness. *Brogammerus reticulatus mandella subsp. nov.* is separated from *B. reticulatus dalegibbonsi* by the size and shape of the white lateral blotches. In *Brogammerus reticulatus mandella subsp. nov.* these are long and thin and penetrate beyond the

dark brown patterning on the side of the snake to end within the light grey pigment. By contrast in *B. reticulatus dalegibbonsi* the same white lateral blotches end within the dark brown patterning on the sides of the snake. Specimens from Obi and Bisa are attributable to the taxon *B. reticulatus dalegibbonsi*.

Distribution: *B. reticulatus mandella subsp. nov.* is known only from the island of Halmahera, Indonesia and immediately adjacent outliers.

Etymology: Named in honour of the late Nelson Mandella, former prisoner then first “Black” President of the Republic of South Africa, in recognition for his efforts in averting the widely forecast “bloodbath” expected when the Apartheid regime was toppled.

APARALLACTUS SMITH, 1849 SENSU LATO

Hoser (2012d) divided the genus *Aparallactus* Smith, 1849 three ways. The species *Aparallactus jacksonii* (Günther, 1888), was also believed to be sufficiently distinct to warrant subspecific recognition at the time, but action to do so was deferred pending further examination of relevant material. The differences between this species and others within *Aparallactus* Smith, 1849 as defined by Hoser (2012d) are in fact worthy of full generic-level differentiation. As there is no available name for the monotypic group within the Zoological Code (Ride *et al.* 1999), a new genus is defined below for this taxon.

SNOWDONUS GEN. NOV.

Type species: *Uriechis jacksonii* Günther, 1888.

Most commonly known as *Aparallactus jacksonii* (Günther, 1888).

Diagnosis: Externally the monotypic genus *Snowdonus gen. nov.* is similar in appearance to other species within *Aparallactus* Smith, 1849, the genus in which this species has been placed until now.

However in many aspects of biology this species differs sharply from all other species of *Aparallactus* and also *Elapops* Günther, 1859 and *Plumridgeus* Hoser, 2012, the latter two genera removed from *Aparallactus* by Hoser (2012d), noting that most current texts treat all species within these genera as being within *Aparallactus*.

Snowdonus gen. nov. is readily separated from all other species of *Aparallactus*, *Elapops* and *Plumridgeus* by the following unique suite of characters: 138-166 ventrals, single anal, 33-52 single subcaudals, 15 mid-body scale rows, no loreal, 6 upper labials, the second separated from the prefrontal, third and fourth labials entering the orbit; preocular, two postoculars, 1+1 temporals; rostral is much broader than deep, being visible from above; internasals are much shorter, narrower and smaller than the prefrontals; preocular contacts the nasal; frontal is longer than broad, much broader than the supraocular, long as or slightly shorter than large parietals; postoculars contact anterior temporal; temporals separate parietals from the upper labials; 6 lower labials, first contacts below behind the mental; 3 lower labials contact the anterior chin shields, about as long as or slightly longer than posterior; dorsally nut brown to sandy or sometimes pinkish brown; white venter; there is a black transverse nuchal collar edged yellow on either side (anteriorly and posteriorly); there is a pair of yellow spots behind the parietal shields. The sides of the head are yellow, with the shields bordering the eye black.

This is a small species with a maximum length under 30 cm total (about one fifth of this being tail in males and one sixth in females). Females have higher ventral and lower subcaudal counts than males.

Snowdonus gen. nov. are live-bearing snakes, the young born being between a third and half the total length of the adult snake.

All species of *Aparallactus*, *Elapops* and *Plumridgeus* are live bearers.

Snowdonus gen. nov. have been recorded as feeding on

centipedes, including from within hours of birth (Pitman, 1974).

The differences between *Snowdonus gen. nov.* and other species assigned to the genera *Aparallactus*, *Elapops* and *Plumridgeus* are well known and documented (Pitman 1974, Spawls *et al.* 2001, Largen and Spawls 2010).

Distribution: Restricted to sub-Saharan East Africa, including, Ethiopia, North Tanzania, South Sudan, Kenya, Somalia and Uganda.

Etymology: Named in honour of Edward Joseph Snowden (born June 21, 1983) an American computer specialist, a former Central Intelligence Agency (CIA) employee, and former National Security Agency (NSA) contractor who disclosed top secret NSA documents to several media outlets, initiating the NSA leaks in May 2013, which revealed operational details of a global surveillance apparatus run by the NSA and other members of the Five Eyes alliance, along with numerous commercial and international partners.

Having been a victim of illegal long-term surveillance by corrupt government officials myself and the criminal attacks on my family arising from the information so obtained, I view the ongoing mass surveillance of law-abiding citizens by corrupt government employees as a serious crime and at the same sort of level as mass killings of Jews by dictators in years past as well as other acts of mass genocide and attacks on decent people.

Hence it is entirely appropriate that a genus of snakes be named in honour of this corruption whistleblower.

Content: *Snowdonus jacksonii* Günther, 1888 (monotypic).

NOMENCLATURAL STATEMENT IN TERMS OF THE DESCRIPTIONS WITHIN THIS PAPER

Unless mandated by the zoological code, no names proposed within this paper should be amended in any way for the purposes of correction, gender change or the like. In terms of priority of names in the event of conflict, where more than one newly named taxon is deemed conspecific or within a single taxon group by a later author, the priority to be taken is by page priority, this meaning the first taxon described in full is the one to take precedent.

CONFLICT OF INTEREST

This author reports no conflict of interest in terms of any material within this paper.

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**Tidying up Death Adder taxonomy (Serpentes: Elapidae: *Acanthophis*):
including descriptions of new subspecies and the first ever key to
identify all recognized species and subspecies within the genus.**

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ABSTRACT

The taxonomy and nomenclature of Australasian Death Adders (Genus *Acanthophis* Daudin, 1803) was largely resolved by the papers of Hoser (1998) and Hoser (2002).

Since then a Welsh snake fancier and career criminal named Mr. Wolfgang Wüster and his associates in crime have engaged in a reckless and destructive global campaign to stop people using correct taxonomy and nomenclature for the relevant species (e.g. Wüster 2001, Wüster *et al.* 2001, 2005).

For more detailed listings of the destabilizing publications by Wüster and associates see Hoser (2013).

This campaign by Wüster culminated in the reckless publication of Kaiser (2012a, 2012b) Kaiser *et al.* (2013) and Kaiser (2013), all of which were properly condemned by Cogger (2013, 2014), Shea (2013a, 2013b, 2013c, 2013d) and many others.

Further studies have identified five divergent forms of *Acanthophis* previously not recognized by most herpetologists but upon examination are distinct and worthy of taxonomic recognition.

These are formally described herein according to the Zoological Code (Ride *et al.* 1999).

These are *Acanthophis wellsei hoserae* *subsp. nov.* from the Pilbara region north of the Fortescue River in the region east of the Yule River, Western Australia, *Acanthophis pyrrhus maryani* *subsp. nov.* from drier parts of Western Australia south of the Pilbara region and away from the southern margins of the state, *Acanthophis pyrrhus moorei* *subsp. nov.* from an elevated site in the Channel Country of south-west Queensland, *Acanthophis antarcticus granti* *subsp. nov.* from Magnetic Island, Queensland and the immediately adjacent coastal ranges and *Acanthophis groenveldi mumpini* *subsp. nov.* from Obi Island (Indonesia) and at least one immediately adjacent outlier in eastern Indonesia in the waters south of Halmahera and north of Ceram.

The two species of *Acanthophis* from Tanimbar Island and the Kei Islands are formally described herein with descriptions that properly separate them from all other species in order to resolve potential or alleged confusion arising from earlier publications.

For the first time ever, a key is provided to identify all species of *Acanthophis* from all parts of their range, including all parts of Australia, Papua New Guinea and Indonesia.

Furthermore the key is usable without the need to know the provenance of the relevant specimen.

Keywords: Taxonomy; Australasia; *Acanthophis*; Hoser; Pilbara; Yule River; Western Australia; Obi; Indonesia; Magnetic; Island; Queensland; *wellsei*; *pyrrhus*; *antarcticus*; *crotalusei*; *barnetti*; *woolfi*; *cummingi*; *bottomi*; *hawkei*; *lancasteri*; *rugosus*; *laevis*; *praelongus*; *schistos*; *cliffrosswellingtoni*; *donnellani*; *groenveldi*; *macgregori*; *yuwoni*; new subspecies; *hoserae*; *maryani*; *moorei*; *granti*; *mumpini*.

INTRODUCTION

The taxonomy of Australasian Death Adders was largely resolved by the papers of Hoser (1998) and Hoser (2002). Significant is that these papers for the first time formally restricted the taxon *Acanthophis praelongus* Ramsay, 1877 to the Cape York region of Queensland and went further in

describing unnamed forms from northern Australia and the adjacent region.

Since then a Welsh snake fancier named Wolfgang Wüster and his associates have engaged in a destructive campaign to stop people using correct taxonomy for the relevant species (e.g. Wüster 2001, Wüster *et al.* 2001, 2005), or for more detailed

listings of the destabilizing publications by Wüster see Hoser (2013).

This campaign by Wüster culminated in the reckless publication of Kaiser (2012a, 2012b), Kaiser *et al.* (2013) and Kaiser (2013), all of which were properly condemned by Cogger (2014a), Shea (2013a, 2013b, 2013c, 2013d) and many others.

Notwithstanding Shea's 2013 comments and Cogger's (2014a) condemnation of the destabilizing tactics of Wüster and his gang, which includes the likes of Mark O'Shea, convicted wildlife smuggler David John Williams and taxonomic vandal Wulf Scheip (see for example Schleip 2008), Cogger (2014) did little to stop the widespread confusion in terms of the genus *Acanthophis* due in part to the hate campaign against Cogger's book orchestrated by the Wüster gang on various Facebook pages (various authors 2014).

In terms of the Death Adders and as a direct result of the reckless actions and confusion caused by Wüster's actions (notably through the publication of Wüster *et al.* 2005), Cogger's (2014a) diagnostic keys are in error and if used, would not even necessarily correctly identify the limited number of species he recognizes in his ultra conservative treatment of the Australian reptiles.

These errors were subsequently conceded by Cogger (2014b), who also stated that his book represented the majority view of Australian herpetologists at the relevant time and not necessarily what was correct.

As a result of the ongoing confusion with regards to *Acanthophis* classification, I herein provide an accurate diagnostic key that can be used to accurately identify all described and recognized species and subspecies as described and recognized by Hoser (1998), Hoser (2002) and this paper.

For the purposes of this paper, I rely exclusively on the diagnostic information as published by Hoser (1998 and 2002) on the basis that no evidence from anywhere has emerged to contradict the information within that paper and any taxonomic conclusions that have arisen since then.

Of note in particular is that the morphology-based descriptions of Death Adder species from New Guinea and nearby islands by Hoser (1998) and Hoser (2002), have been largely confirmed by more recent geological and molecular evidence for species groups across the same geographical range, with species groups being split along similar lines (geographical) to those of the Death Adders in Hoser (1998 and 2002) and obviously affected by the same ecological barriers in the form of deep sea water zones or high and cold mountains.

Examples of such studies and papers include Harvey *et al.* (2000), Rawlings and Donnellan (2003), Rawlings *et al.* (2004, 2008) and Reynolds *et al.* (2013a, 2013b, 2014), all of whom showed north/south splits in similar python species in island New Guinea (separated by the central ranges cordillera) and where applicable, different taxa in the islands to the west of New Guinea (separated by deep seas).

As part of my ongoing brief to study Death Adders, now spanning a period in excess of 40 years, further studies have identified five divergent forms of *Acanthophis* previously not recognized as distinct but worthy of taxonomic recognition.

These are formally described herein according to the Zoological Code (Ride *et al.* 1999) at the conservative level of subspecies.

These are *Acanthophis wellsei hoserae subsp. nov.* from the Pilbara region in the region generally north of the Fortescue River, but notably east of the Yule River, in north-west Western Australia, *Acanthophis pyrhus maryani subsp. nov.* from drier parts of Western Australia south of the Pilbara region and away from the southern margins of the state, *Acanthophis pyrhus moorei subsp. nov.* from south-west Queensland and currently known only from a sample of four females from the same isolated location, *Acanthophis antarcticus granti subsp. nov.* from Magnetic Island, Queensland and the immediately adjacent coastal ranges and *Acanthophis groonveldi mumpini subsp. nov.*

from Obi Island and outliers in Indonesia.

The species of *Acanthophis* from Tanimbar Island and the Kei Islands are formally described herein with descriptions that properly separate them from all other species in order to resolve potential confusion allegedly or potentially arising from earlier publications.

I do note however that in terms of *Acanthophis wellsei hoserae subsp. nov.* from the Pilbara region of Western Australia, there is a strong argument for the taxon described to be recognized as a full species. I do however not do this, instead treating it herein as a subspecies only, pending molecular evidence one way or other. This is also to keep the treatment of this form consistent with that of *Acanthophis wellsei donnellani* Hoser, 2002, the taxon from the Cape Range of Western Australia.

However I note herein that already a number of correspondents including Brian Bush (Bush *et al.* 2013) have written that they believe *Acanthophis wellsei donnellani* Hoser, 2002 is in fact a species level taxon.

Those authors rely only on my own previously published morphological differences to sustain this point of view.

Due to the fact that Hoser (1998) and Hoser (2002) as well as the definitive paper on the genus as a whole published by Hoser (1995), are all widely available, including on the internet via the site <http://www.herp.net>, it is not necessary for me to provide extensive documentation of the genus or rehash this material.

However key publications relevant to the genus *Acanthophis* and taxonomy of the genus as discussed herein, do include the following: Aplin (1998), Aplin and Donnellan (1999), Ball (1993), Barnett and Gow (1992), Bird (1992), Bohme (1991), Boulenger, (1898), Bush (1998), Carpenter and Ferguson (1977), Carpenter *et al.* (1978), Cogger (1983, 2014), Coventry and Robertson (1991), Davis *et al.* (1980), Doughty *et al.* (2011), Ehmann (1992), Fairley (1929), Fearn (2001), Fry (1998), Fry *et al.* (2001), Fyfe and Munday (1988), Gilbertson-Middlebrook (1981), Glasby *et al.* (1983), Gow (1977, 1981), Greer (1989), Hay (1972), Hoser (1981, 1982, 1983, 1984a, 1984b, 1985a, 1985b, 1985c, 1987, 1989, 1991, 1992, 1993, 1995, 1996, 1997a, 1997b, 1998, 1999, 2001, 2002, 2012a, 2012b, 2013), Hoser and Williams (1991), Hudson (1979), ICZN (1991, 2000), Johnston (1987), Kim and Tamiya (1981), Lindgren (1975), Longmore (1986), Loveridge (1948), Macleay (1877), Maryan *et al.* (2014), McDowall (1984), Menkhorst (1994), Mirtschin (1976, 1982, 1985), Mirtschin and Davis (1991, 1992), O'Shea (1996, 1998), Pyron *et al.* (2011), Ramsay, (1877), Reynolds *et al.* (2013a, 2013b), Shaw and Nodder, (1802), Shea (1998, 2002, 2013a, 2013b, 2013c, 2013d), Sheumack *et al.* (1979), Shine (1980, 1991), Smith (1997), Stettler (1985), Storr (1981), Storr *et al.* (1986), Swan (1990), van Woerkom (1985), Valentic (1998), Wells (2002), Wells and Wellington (1983, 1985, 1999), Wilson and Knowles (1988), Wilson and Swan (2003), Worrell (1972) and sources cited therein.

There are countless other publications on snakes of the genus *Acanthophis* that effectively either rehash the information provided in the above sources, or alternatively invariably provide the same information in original form.

In the event a later author seeks to merge one or more taxon described within this paper, the order of priority should be by page priority in terms of this paper; that is the first name listed is the first to be used. Gender, spellings and the like of names should not be altered in any way unless mandated by the Zoological Code, even if apparently wrong in the original descriptions herein.

This also applies to my earlier named taxon, *Acanthophis cummingi* Hoser, 1998 named after Fia Cumming of Lyons, Canberra, ACT, Australia and formerly of Chatswood, Sydney, NSW, Australia.

While no herpetologist has yet raised the issue of gender of that name, I do so herein both as original author and first revisor and make it known that the assignment was deliberate.

Cumming is in fact a female, but the gender is a deliberate play on her actions to expose corruption in NSW Wildlife authorities, the NPWS, in that it took what Australians call "balls" (an extreme form of courage usually referred to as being only found in very brave men).

As Cumming displayed "balls" when putting her life at risk by blowing the whistle on immense systemic corruption, I think it is appropriate in the circumstances to give her a male gender scientific name recognizing her efforts.

The taxon *Cummingea* Hoser, 2009 also named in her honour, recognizes her feminine gender.

Also of note is that in 2002, Richard Wells divided the genus *Acanthophis* Daudin, 1803 into two, placing *A. pyrrhus* Boulenger, 1898 into his proposed new genus *Aggressiserpens* Wells, 2002.

While the name has been effectively ignored by most other authors.

However it is now also subject to a planned over-writing by Wolfgang Wüster *et al.*, as specifically identified in Kaiser (2012b) and Kaiser *et al.* (2013).

As Cogger (2014b) said, there is no legal justification or basis for the action of Kaiser *et al.* and so the Wells name remains valid and available under the Zoological Code (Ride *et al.* 1999) if one accepts his taxonomy.

Notwithstanding this, I have chosen not to recognize the genus as such at this stage, preferring to place all within *Acanthophis*, and with the only likely prospect of change where I stand pending a better molecular sampling of relevant taxa within *Acanthophis* as presently understood that indicates species level divergence between clades in excess of 8-10 MYA by well calibrated means.

However phylogenies produced to date have indicated a distinct clade including the species *A. wellsei* Hoser, 1998 and *A. pyrrhus*, being significantly divergent from all other *Acanthophis* taxa (but not well calibrated), which also matches the morphology of the relevant species.

Therefore I find it entirely appropriate to (at the present time) recognize these western taxa taxonomically at the subspecies level. For this, the name *Aggressiserpens* Wells, 2002 is the correct name of use under the rules of the Zoological Code (Ride *et al.* 1999), including the rules of homonymy, priority and stability. I add that no one should use or adopt any invalid junior synonyms coined by Wüster *et al.*

THEFT OF RESEARCH FILES AND DATA

I note also the following. In 2006 an online petition sponsored by a group of animal-hating pseudoscientists including career criminals Wolfgang Wüster, Mark O'Shea, David John Williams, Bryan Fry and others posted at: <http://www.aussiereptileclassifieds.com/phpPETITION> (Hunter *et al.* 2006) called for my successful wildlife education business and all my other herpetological activity to be shut down by the government of Victoria, here in Australia.

These men were successful in that after a ruthless five-year campaign which included a non-stop barrage of lies and deceptive conduct they got their wish granted.

On 17 August 2011, 11 heavily armed police and wildlife officers conducted a highly illegal and violent raid on our family home and research facility. The raid was led by government employed wildlife officers Glenn Sharp and Emily Gibson, who claimed they were raiding me at the behest of Terri Irwin, owner of Australia Zoo, Queensland. Irwin was the wife of animal attacker, the late Steve Irwin, a police-protected criminal, himself killed when mistreating a stingray on 4 September 2006. One of Wüster's friends, another serial law-breaker named Tony Harrison had actively solicited Irwin's support in having the wildlife officers conduct the armed raid and had bragged about the (then) impending raid on a Facebook hate site he had created some months earlier (details published by Hoser 2013).

In this raid, myself, my wife and two young daughters were

arrested at gunpoint and held hostage in the kitchen of the house for nine hours while the facility was ransacked and effectively destroyed. Besides the unspeakable acts of killing tame captive snakes in cages and criminal damage to the cages themselves, irreparable damage to household goods, parked motor vehicles and the like, the raiding officers illegally shut down our business.

They then effectively placed myself under house arrest at gunpoint for some months after the raid.

An application by myself to the Supreme Court of Victoria led to the re-opening of our unlawfully shut down wildlife education business, but that didn't stop Sharp, Gibson and others at the DSE engaging in illegal conduct to try to stop the business trading, including breaches of the trademarks laws and fair trading laws. Simultaneously, Sharp and Gibson also green-lighted criminal activities by others they were corruptly protecting.

As a direct result of culpable misconduct by various DSE officers, two people died on 14 February 2013. No one at the DSE was charged.

Of greater relevance here in terms of this scientific paper is that at the time of the raid on 17 August 2011, research files spanning more than 40 years were taken and never returned, including materials and records relevant to this paper.

Material taken included all the computers, disks, hard drives, backups, cameras, scientific literature and other forms of information storage at the facility. All were loaded into the back of a truck and trailer and carted off.

Faced with the dilemma of deciding whether to spend another fourty years gathering data, by which time I may be dead from old age, being aged 52 as of 2014, or publishing the relevant paper/s with less data, I have opted to publish.

Underlying this motivation has been an increasing concern that a delay to formally identify and name undescribed biodiversity may lead to its extinction before another scientist gets around to the matter.

Engstrom *et al.* (2002) wrote: "The documentation of this diversity must be seen as an activity that is done not just for posterity but for immediate action and protection."

A number of authors including Kaiser (2012a, 2012b, 2013 and 2014), Kaiser *et al.* (2013), Naish (2013) and Wüster *et al.* (2014), all part of the group of people effectively controlled by Wüster, have been highly critical of the fact that I have assigned names to unnamed clades of snakes. Their unscientific and childish attacks, continued incessantly on social media such as Facebook and Twitter are rejected herein as destabilizing the nomenclature and impeding the progress of science.

Their ridiculous comments and false and defamatory statements are systematically rebutted by Hoser (2013).

I also note that many taxa formally named by myself for the first time in earlier publications (e.g. Hoser 2000a, 2000b) are in fact threatened species.

Therefore I note the sensible remarks of Engstrom *et al.* (2002) as a perfectly reasonable explanation for the publishing of taxon descriptions for such unnamed groups. This remains the case even if a sizeable amount of my original research, files, photos and data have been stolen and therefore cannot be relied upon and incorporated into these contemporary publications.

THE NEED FOR A WORKABLE DICHOTOMOUS KEY TO THE GENUS

In order to reduce confusion among herpetologists in terms of the genus *Acanthophis*, and to combat the misinformation about these snakes being bandied around on the internet and elsewhere, I have for the first time ever, provided a dichotomous key to identify all species and subspecies of *Acanthophis* from all parts of their range, including all parts of Australia, Papua New Guinea and Indonesia, and without the need to know the provenance of the relevant specimen.

Noting the now extensive private trade in *Acanthophis* species both within Australia and elsewhere, it is more important than ever that people be able to accurately identify the species of their animals.

Even if a keeper or herpetologist chooses not to recognize given taxa identified herein based on reckless misinformation by Wüster or others, the key will enable users to accurately ascertain the provenance of their animal with certainty to enable proper conservation measures to be undertaken.

To give an idea as to the potential use of the key provided herein, I refer to the illegal armed raid on my research facility led by corrupt Victorian Wildlife Officers, Glenn Sharp and Emily Gibson on 17 August 2011.

The raid was nothing more than a fishing exercise seeking evidence of non-existent criminal offences, as part of a wide-ranging and illegal attack on my lawful wildlife education business and my wife and two young and vulnerable children.

Taken from the freezer was a bog-standard deceased Floodplains Death Adder, *Acanthophis cummingi* Hoser, 1998, which in line with other well-preserved corpses I would have lodged with the local National Museum of Victoria and was merely awaiting delivery there by myself at a mutually convenient date and time. This was a legally held captive-bred animal that had died and being held legally and should never have been taken from the facility by the wildlife officers.

Removing identifying notes attached to the specimen, the DSE officers handed the snake to resident Museum Herpetologist, Jane Melville (a lizard expert with effectively zero expertise on elapid snakes) to identify, with the DSE officers hoping that the snake may be identified by her as an illegal "unscheduled taxon" such as *Acanthophis wellsei* Hoser, 1998.

(Most, if not all specimens of that taxon found by wildlife officers in Victoria have to date, under the directions of Ron Waters, Glenn Sharp and Emily Gibson been seized and destroyed as part of their warped campaign to rid the world of all "Hoser-named" taxa, the most recent case being several specimens taken from the facility of Rob Valentic which were then killed under direction).

Using her copy of Cogger (2000), Melville later wrote in a statement (Melville, 2011) that she was unable to accurately identify the snake to species.

There was nothing wrong with her statement in as much as she never claimed to be an expert on Death Adders. However had the officers bothered to take the snake from the reptile facility to me in the kitchen (where I was being held hostage), I could have either directed the officers to the written notes accompanying the snake or reidentified it for them!

During the same raid and using a copy of Wilson and Swan (2003) as their reference source, the wildlife officers issued a so-called "seizure/retention notice" on a geriatric Djarra Death Adder, *Acanthophis woolfi* Hoser, 1998. Without apology, the notice was withdrawn a month later.

In fairness to the authors Wilson and Swan, the error by the wildlife officers was as a result of their inability and failure to read the book and not the fault of the authors.

The error came about due to the wildlife officers reckless guessing as to what species the snake was.

In legal proceedings in early 2011, when a photo of the same snake being used at a wildlife display at Endeavour Hills Shopping Mall in January 2009 was shown to wildlife officer Doug Winkle, he gave his "expert" evidence that the same snake was a "Tiger Snake", this evidence being accepted as correct by the corrupt and biased magistrate at the time (later overturned on appeal). Winkle also later admitted that he was in error and that the snake was a Death Adder as put to him by my lawyer, however, Winkle went on to say he had no idea what species the snake was.

In other words a dichotomous key for the genus *Acanthophis*, no matter how good it is, will only be worthwhile if actually used!

ACANTHOPHIS WELLSEI HOSERAE SUBSP. NOV.

Holotype: A specimen at the Western Australian Museum, Perth, Western Australia, specimen number: R139366 from Meentheena, Western Australia. The Western Australian Museum is a government controlled facility that allows access to its specimens for research purposes.

Paratypes: Two specimens at the Western Australian Museum, Perth, Western Australia, specimen numbers: R139137 and R139239 from Meentheena, Western Australia. The Western Australian Museum is a government controlled facility that allows access to its specimens for research purposes.

Diagnosis: *Acanthophis wellsei hoserae subsp. nov.* has until now been regarded as a variant of *Acanthophis wellsei* Hoser, 1998. It is known definitively from the hilly region east of the Yule River and north of the Fortescue River in Western Australia.

In common with *A. wellsei wellsei*, *A. wellsei hoserae subsp. nov.* is believed to occur in both orange/red and black/red morphs, although black/red morphs are relatively uncommon. However the two taxa are most readily separated as follows: For *A. wellsei hoserae subsp. nov.* the darker cross-bands at mid-body are either wider than the light bands, of the same width or barely noticeably narrower than the lighter bands. By contrast in *A. wellsei wellsei* (the only taxon this new species may be easily confused with), the darker cross-bands are noticeably narrower and obviously so at mid-body.

A. wellsei hoserae subsp. nov. are also separated from *A. wellsei wellsei* by the fact that behind the parietals are several well-formed scale ridges running longitudinally to the back of the head. In *A. wellsei wellsei* the same ridges are so small as to be indistinct.

The other subspecies of *A. wellsei* is *A. wellsei donnellani* Hoser, 2002 from the Cape Range of Western Australia.

In that taxon, females have on average, statistically significantly lower ventral scale counts than *A. wellsei* from elsewhere, as well as a relatively longer tail.

The supraocular scales in *A. wellsei donnellani* are distinctly flared when compared with other *A. wellsei*.

Keeling in *A. wellsei donnellani* is highly pronounced on scale rows 1-4.

Specimens of *A. wellsei donnellani* are a paler ground colour, with less contrasting bands than those of all *A. wellsei wellsei* and *A. wellsei hoserae subsp. nov.* from the western parts of their range. At the northern margins of the range of *A. wellsei hoserae subsp. nov.* light coloured individuals are most common, but these may be separated from *A. wellsei donnellani* by the traits just outlined and the fact that *A. wellsei donnellani* is of more yellowish-greyish colouration (on a light-reddish-brown background) most of the time and the dorsal crossbands are relatively indistinct as compared to the other two subspecies of *A. wellsei*.

In the lighter individuals of *A. wellsei hoserae subsp. nov.* there are noticeable but small white markings on the supralabials. In *A. wellsei donnellani* such markings are either absent or peppered to such an extent as to be indistinct.

For *A. wellsei donnellani* the dorsal ground colour is often lightish with yellowish greyish crossbands superimposed on a light-reddish-brown background, with black tips on the posterior margins of the yellowish grey crossband scales (black tips are on the last row only on each band).

A. wellsei donnellani is restricted to the Cape Range area of Western Australia as opposed to the main *A. wellsei wellsei* population that is found in the region centered around the Hamersley Ranges of Western Australia.

A. wellsei hoserae subsp. nov. is known to occur in the hilly region bounded by the Yule River, Western Australia (Woodstock, being the known south-west extremity for the range of the subspecies) and the deserts east and north of here, the

easternmost site known for the taxon being Carawine Gorge, Western Australia and the northernmost site being 29 km North-north-east of Marble Bar, Western Australia. It is also believed to be distributed in the region west of that just outlined to be found around the Chichester Ranges of WA and immediately adjacent hilly areas of suitable habitat to the north and to the edge of the Great Sandy Desert and sandy coastal areas of otherwise unsuitable habitat, this also being taken to include areas with large numbers of Desert Death Adders (*Acanthophis pyrrhus*). Its distribution is bounded by the Fortescue River valley in the south and flat dry areas on the other sides, although it is possible that *A. wellsei wellsei* occur in the Chichester Ranges where it is closest to the Fortescue River Valley, this being the region nearest the West Coast of Australia as opposed to the upper reaches of the basin.

The distribution of the three different subspecies of *Acanthophis wellsei* by geographical region mirrors that of other reptiles who's habits are essentially rock-dwelling or prefer such habitats and are in effect stapled to such habitat. The barriers that have affected one group of saxacoline reptiles, seems to have affected many, although for the *Acanthophis wellsei* complex it seems that a competing species (successful in a different habitat) forms the distributional barrier/s as opposed to any extreme unsuitability of the intervening habitat itself..

By way of example, the distribution of *A. wellsei hoserae subsp. nov.* effectively mirrors that of *Varanus pilbaraensis* Storr, 1980 (as defined by Maryan *et al.* 2014) and *Egernia eopsis* Doughty *et al.*, 2011.

Colouration differences in populations appears to reflect substrate (rock type) and corresponding soil colours, as well as perhaps that of dead vegetation on the ground where the snakes may rest.

Etymology: Named in honour of my long-suffering wife, Shireen Hoser in recognition for her long-term contributions to herpetology, including through her management of the wildlife education business, Snakebusters: Australia's best reptiles. Also recognized is her reptile education work in Africa.

ACANTHOPHIS PYRRHUS MARYANI SUBSP. NOV.

Holotype: A specimen at the Western Australian Museum, Perth, Western Australia, specimen number: R154930 from Carosue Dam, 110 km North East of Kalgoorlie, Western Australia. The Western Australian Museum is a government controlled facility that allows access to its specimens for research purposes.

Paratype: A specimen at the Western Australian Museum, Perth, Western Australia, specimen number: R146966 from Carosue Dam, 110 km North East of Kalgoorlie, Western Australia. The Western Australian Museum is a government controlled facility that allows access to its specimens for research purposes.

Diagnosis: *Acanthophis pyrrhus maryani subsp. nov.* is readily separated from both the two northern subspecies, namely *A. pyrrhus pyrrhus* Boulenger, 1898 from the Northern Territory and *A. pyrrhus armstrongi* Wells and Wellington, 1985 from the coastal region of the Pilbara in Western Australia and nearby areas by the following suite of characters: 139-144 ventrals; 43-54 subcaudals; 15-31 undivided subcaudals; limited white pigment on the supralabials, with any present being heavily peppered with orange and numerous distinct black flecks at the margins of the dorsal cross-bands (these flecks being indistinct in the other two subspecies).

A. pyrrhus armstrongi Wells and Wellington, 1985 has a higher ventral count (over 150) than *A. pyrrhus maryani subsp. nov.* (less than 144).

A. pyrrhus pyrrhus is readily separated from both the Western Australian subspecies by the dorsal colouration. The lighter cross bands are orangeish as opposed to yellow.

Both *A. pyrrhus pyrrhus* and *Acanthophis pyrrhus maryani subsp. nov.* have a noticeable region of dark pigment on the

upper labials from the eye to the back of the head. This is not evident in *A. pyrrhus armstrongi*.

Aplin and Donnellan (1999) provide further comparisons between the scale counts for the three subspecies, identified by them as northern, central and southern populations (see page 290, table 7).

Acanthophis pyrrhus maryani subsp. nov. is known from all drier parts of Western Australia south of the Pilbara region, and including areas immediately south and east of there, with the distribution not including the wetter parts of the south-west and also the southern margin of the state, which is where the species *Acanthophis antarcticus* (Shaw and Nodder, 1802) is found.

The subspecies is also found in adjacent parts of South Australia.

Etymology: Named in honour of Brad Maryan, of Western Australia in recognition of many decades of work involving western Australian herpetology and in the face of many years of improper harassment by officers of the Western Australian Wildlife Department (CALM).

ACANTHOPHIS PYRRHUS MOOREI SUBSP. NOV.

Holotype: A specimen number J455512 at the Queensland Museum, Brisbane, Queensland, collected from Durrie Station, near Birdsville, Queensland, Australia. The Queensland Museum is a government-owned facility that allows scientists access to their collection.

Paratypes: Three specimens, numbers J22451, 31646, 39570 at the Queensland Museum, Brisbane, Queensland, collected from Durrie Station, near Birdsville, Queensland, Australia. The Queensland Museum is a government-owned facility that allows scientists access to their collection.

Diagnosis: *Acanthophis pyrrhus moorei subsp. nov.* is most readily separated from other *A. pyrrhus* by build, being noticeably more stout than other three subspecies. This reflects also in the lower ventral count of 127-143 in females (n=4), versus 139-158 in the other three subspecies.

In other respects the subspecies is most similar to the nominate form of *A. pyrrhus* (which it would otherwise be identified as), but in contrast to that taxon, lacks tiny bluish flecks on the dorsum.

The subspecies *Acanthophis pyrrhus moorei subsp. nov.* is an outlier population from far south-west Queensland only known from the type locality. It is geographically separated from the NT population by an area of unsuitable habitat being riverine floodplains, including that of the Georgina River drainage. Also of note is that there appear to be no records of any *A. pyrrhus* from the Simpson Desert in the south-eastern Northern Territory and immediately adjacent parts of south-west Queensland, noting that the bulk of the habitat there is not unlike a lot of habitat near the heavily collected region of the NT/South Australian border area that also clearly lacks the species.

However unless and until all areas of hilly habitat in the region are properly surveyed, the absence of *A. pyrrhus* in the area should not be assumed with certainty.

Hilly areas to the north and east of Birdsville are inhabited by *A. wolffi* Hoser, 1998 (near Mount Isa and south of there), or *A. antarcticus* (Shaw and Nodder, 1802) (in the Brigalow belt of Western Queensland), or near the NT border *A. hawkei* Wells and Wellington, 1985.

The species *A. rugosa* Loveridge, 1948 (from southern New Guinea), *A. cummingi* Hoser, 1998, *A. lancasteri*, Wells and Wellington, 1985, *A. antarcticus* (Shaw and Nodder, 1802) and *A. wolffi* Hoser, 1998 are all readily separated from *A. pyrrhus* by their more stout build and lower ventral count (under 125).

The same applies in terms of the New Guinea and Islands taxa (west of New Guinea), described by Hoser in 1998 and 2002, all of which have under 125 ventrals.

Etymology: Named in honour of recently deceased Queensland-based herpetologist Mike (Pike) Moore of Brisbane,

in recognition of many decades keeping and breeding little-known species, in particular skinks.

ACANTHOPHIS ANTARCTICUS GRANTI SUBSP. NOV.

Holotype: A specimen number J83133 (a male) at the Queensland Museum, Brisbane, Queensland, collected from Magnetic Island, north Queensland, Australia. The Queensland Museum is a government-owned facility that allows scientists access to their collection.

Paratypes: Two specimens, numbers J76722 (a male) and J76721 (a female) at the Queensland Museum, Brisbane, Queensland, collected from Magnetic Island, north Queensland, Australia. The Queensland Museum is a government-owned facility that allows scientists access to their collection.

Diagnosis: The subspecies *Acanthophis antarcticus granti* subsp. nov. has been variously identified in the literature as both *Acanthophis antarcticus* (Shaw and Nodder, 1802), and *Acanthophis praelongus* Ramsay, 1877.

Based on morphology, the taxon is clearly a variant of *A. antarcticus*, based most notably on the presence of 21 as opposed to 23 mid-body scale rows in *A. praelongus*.

Ventral count for *Acanthophis antarcticus granti* subsp. nov. ranges from 118 to 126 in both sexes and 44-56 subcaudals in both sexes (Fearn, 2001).

Acanthophis antarcticus granti subsp. nov. is separated from the nominate form of *A. antarcticus* and the two western subspecies (*A. antarcticus schistos* Wells and Wellington, 1985 and *A. antarcticus cliffcrosswellingtoni* Hoser, 2002) by the following suite of characters: a slightly raised supraocular; minimal keeling on the head and neck and minimal white pigmentation on the upper labials or in rare specimens where there is substantial white pigment on the upper labials, it is still prevented from entering the orbit by a distinctive zone of dark pigment (which is not seen in other *A. antarcticus*); the individual scales on the venter are characterised by being dark in the centre and light on the edges, as opposed to either immaculate or flecked in other *A. antarcticus*.

The subspecies *Acanthophis antarcticus granti* subsp. nov. is only known from Magnetic Island, north Queensland and large hills (ranges) on the immediately adjacent section of the Queensland coast around Townsville, Queensland, Australia.

Its average adult size is smaller than that of the other *A. antarcticus* subspecies, rarely exceeding 60 cm in total length.

Death Adders from the rainforest zone that commences midway between Townsville and Cairns are clearly a different taxon and attributed to *A. praelongus*, believed to be distributed in a continuous zone to the tip of Cape York and immediately adjacent offshore islands.

There is no evidence to suggest a natural hybrid zone between *A. antarcticus* and *A. praelongus* as suggested by Wilson and Swan (2003).

Furthermore, the original description of *A. praelongus* by Ramsay in 1877, stated that *A. praelongus* has a round pupil. That statement was in error. All snakes within the genus have an elliptical pupil.

Etymology: Named in honour of Scott Grant, of Colac, western Victoria, Australia in recognition of his public benefit work as licensed wildlife demonstrator.

ACANTHOPHIS GROENVELDI MUMPINI SUBSP. NOV.

Holotype: A dried specimen (head and skeleton) at the US National Museum (USNM), Washington, DC, United States of America, specimen number: 237694 from Kampung Anggai, Laiwui, Obi Island, Indonesia.

Diagnosis: In the normal situation the taxon *Acanthophis groenveldi mumpini* subsp. nov. would be identified as *Acanthophis groenveldi* Hoser, 2002 (the nominate subspecies).

However *A. groenveldi mumpini* subsp. nov. is as a rule most readily separated by the configuration of dark patches on the labials.

A. groenveldi mumpini subsp. nov. is separated from all other *Acanthophis* by the configuration of black blotches on the supralabials. There are no black marks on any of the first four supralabials (rarely a tiny speck on the first), followed by blotches on the following three. The first and most anterior of these is either a tiny elongate patch, or more commonly, a tick shape and still tiny. The following patch is large and at least four times the size of the first one.

By contrast in *A. groenveldi groenveldi* the first and second patch are much the same size, although the holotype for the species actually is unusual (and so far unique for the taxon) in that it completely lacks the first such black spot.

In *A. groenveldi mumpini* subsp. nov. the lower labials are characterised by a lack of pigment, with each scale possessing a tiny black patch in the centre of each scale. By contrast in *A. groenveldi groenveldi* (including the holotype) the equivalent patch in each supralabial is medium in size of clearly irregular shape in each scale (these same blotches forming broad triangles with the apex facing the lip in *A. laevis* Macleay, 1877, noting that *A. laevis* is the only other species or subspecies likely to be confused with *A. groenveldi mumpini* subsp. nov. or *A. groenveldi groenveldi*).

Acanthophis laevis has distinctive peppering on the upper parts of the upper labials, a trait not seen in *A. groenveldi*. The configuration of black spots on the upper labials in *A. laevis* is highly variable.

The distribution for the subspecies *Acanthophis groenveldi mumpini* subsp. nov. is Obi island, Moluccas (Muluku) Indonesia and the immediate outlier of Bisa. These are in the waters south of Halmahera and north of Ceram. Of note is that there are also further "wet" preserved specimens at the Museum of Zoology at Bogor, Indonesia from Obi Island.

The only other recognized smooth-scaled Death Adder species with a low ventral count (under 118) and therefore likely to be confused with *Acanthophis groenveldi* (either subspecies) is *Acanthophis macgregori* sp. nov..

What does consistently separate *A. macgregori* from both *A. laevis* and *A. groenveldi* is the fact that the anterior infralabials are characterised by strong dark bars running into the jawline which are more than half the thickness of each scale. In *A. groenveldi* these scales are characterised by light pigment except for a black patch medium in size of clearly irregular shape in each scale (*A. groenveldi groenveldi*) or a tiny black spot (in *A. groenveldi mumpini* subsp. nov.). In *A. laevis* the condition is characterised by broad triangles with the apex facing the lip, but these bars never exceeding 50% of the width of the infralabial scales.

Acanthophis macgregori is also unusual in that most of the upper labials and adjacent scales are nearly completely black, save for three small well-separated white triangles above the upper jawline, which is a configuration not seen in any of the other *Acanthophis* species with ventral counts below 118 scales.

As yet there has been no genetic analysis of *A. macgregori*. However it can be safely assumed that DNA sequencing will separate *A. macgregori* from all other *Acanthophis*. However in the absence of DNA evidence, it can be said that physically *A. macgregori* appears to be closest to *A. laevis* and *A. groenveldi*. (See for both species as described in Hoser 2002).

A. groenveldi mumpini subsp. nov. and the other smooth-scaled Death Adders characterised by ventral counts under 118 ventrals appear to be quite unlike *A. rugosus* Loveridge, 1948 and *A. lancasteri* Wells and Wellington, 1985 found to the mainland areas north and south of Tanimbar in adjacent New Guinea and Australia, both of which are notably heavily rugose in appearance and have 118 or more ventrals. However of note is that *Acanthophis macgregori* sp. nov. does have a slight keeling of scales on the neck (over and above normal snake scale formation), not seen in either *A. laevis* or *A. groenveldi* (both subspecies).

The northern and eastern New Guinea species, *A. barnetti* Hoser, 1998 and *A. crotalusei* Hoser, 1998, are readily separated from the other New Guinea Death Adder taxa by having over 118 ventrals and a lack of extreme rugosity on the head and neck as seen in *A. rugosus*.

A. barnetti Hoser, 1998 and *A. crotalusei* Hoser, 1998 are also distinguished by having considerably more labial pigment than *A. laevis*, *Acanthophis macgregori* sp. nov. and *A. groenveldi* including an absence of large light areas containing a small number of large black blotches or spots.

A. crotalusei is further separated from *A. barnetti* by its considerably more raised supraocular (very pointed) as well as a configuration of distinct speckling on the rear supralabials not seen in *A. barnetti*.

Etymology: Named in honour of Mumpini of The Museum of Zoology at Bogor, Indonesia in recognition a considerable contribution to herpetology over many years.

ACANTHOPHIS MACGREGORI SP. NOV.

Holotype: A specimen held in the Museum of Zoology, Bogor from Tanimbar, Lat: 7°30' Long: 131°30', specimen number MZB 338.

The dorsal colouration of the type specimen is typical for *Acanthophis* in that dorsally it has alternating darker and lighter crossbands.

Paratype: A specimen held in the Museum of Zoology, Bogor from Tanimbar, Lat: 7°30' Long: 131°30', specimen number MZB 2056. The dorsal colouration of the paratype specimen is also typical for *Acanthophis* in that dorsally it has alternating darker and lighter crossbands.

Diagnosis: *Acanthophis macgregori* sp. nov. is separated from all others in the genus by distribution, being the only species to occur on the Island of Tanimbar.

A. macgregori sp. nov. is separated from all other *Acanthophis* species except *A. laevis* Macleay, 1877 and *A. groenveldi* Hoser 2002 by its ventral scalation. The scale count is always under 118. Ventral scale counts for specimens counted to date for *A. macgregori* are 113.

What does consistently separate this species from both *A. laevis* and *A. groenveldi* is the fact that the anterior infralabials are characterised by strong dark bars running into the jawline which are more than half the thickness of each scale. In *A. groenveldi* these scales are characterised by light pigment except for a smallish dark spot in the centre of each scale. In *A. laevis* the condition is characterised by broad triangles with the apex facing the lip, but these bars never exceeding 50% of the width of the infralabial scales.

This species appears to be quite unlike *A. rugosus* Loveridge, 1948 and *A. lancasteri* Wells and Wellington, 1985 found to the mainland areas north and south of Tanimbar in adjacent New Guinea and Australia, both of which are notably heavily rugose in appearance. However of note is that *Acanthophis macgregori* sp. nov. does have a slight keeling of scales on the neck (over and above normal snake scale formation), not seen in either *A. laevis* or *A. groenveldi*.

Acanthophis macgregori sp. nov. is also unusual in that most of the upper labials and adjacent scales are nearly completely black, save for three small well-separated white triangles above the upper jawline.

As yet there has been no genetic analysis of *A. macgregori*. However it can be safely assumed that DNA sequencing will separate *A. macgregori* from all other *Acanthophis*. However in the absence of DNA evidence, it can be said that physically *A. macgregori* appears to be closest to *A. laevis* and *A. groenveldi*. (See for both species as described in Hoser 2002).

A. macgregori is known to occur in red and greyish brown morphs.

Etymology: Named after former Victorian Policeman Andrew Macgregor for his efforts in trying to expose corruption in the

Victoria Police and in the post year 2000 period in relation to the government version of events following the Port Arthur Massacre in Tasmania.

ACANTHOPHIS YUWONI SP. NOV.

Holotype: A female specimen held in the Zoological Museum of Amsterdam, The Netherlands, ZMA 16222 from the Kei Islands, Indonesia Approx. Lat: 5° 40' Long: 133°. Total length 39.9 cm, tail 6.7 cm 121 ventrals. The type specimen is over 100 years old and thus the colouration may be slightly different from that in life. The dorsal colouration of the type specimen is one of a brownish nature consisting of alternating darker and lighter cross-bands, the darker cross-bands being more than twice as broad as the lighter ones and with darker scales towards the anterior edges. The top of the head has dominantly darkish pigment, with a distinct light brown line down the anterior centre of the head. Some of the labials have dark blotches. The tail has a yellowish-almost white tip. The ventralia are dark brown with a pale edge.

Diagnosis: *A. yuwoni* sp. nov. is similar in many respects to *A. crotalusei* Hoser, 1998 and *A. rugosus* Loveridge, 1948, from which it can be readily separated by distribution. *A. yuwoni* sp. nov. is the only *Acanthophis* known from the Kei Islands. It is separated from *A. laevis* from nearby New Guinea, *A. groenveldi* from nearby Ceram and *A. macgregori* from nearby Tanimbar by its higher ventral count (more than 118). There is no known overlap in this character between *A. yuwoni* sp. nov. and the other three species (*laevis*, *groenveldi* and *macgregori*). *A. yuwoni* is separated from all other *Acanthophis* by distribution. *A. rugosus* is readily separated from *A. yuwoni* sp. nov. by a characteristic darkening towards the anterior. The posterior supralabials or adjacent temporal shields of *A. yuwoni* sp. nov. are characterised by one or more large black blotches. This area is comprised of smaller blotches and/or peppering in *A. crotalusei*. *A. barnetti* Hoser, 1998 lacks prominent dark blotches on a whiteish background as seen in *A. yuwoni* sp. nov. and the smooth-scaled species characterised by under 118 ventrals.

Etymology: Named after Frank Bambang Yuwono, now of Melbourne, Australia, and formerly of Indonesia for his ongoing contributions to herpetology in a relatively understudied part of the world, namely the eastern Indonesian archipelago.

CONCLUSIONS

While it is argued by some that the use of subspecies is a form of unnecessary taxonomic exaggeration, I reject that thesis. Identification of discrete and differing populations also enables conservation priorities to be set in a way that may prevent contamination of wild gene pools in future, especially if there is a need to translocate specimens for any purpose.

This is an increasingly significant issue as greater numbers of licensed snake controllers operate in the Australian region. Under license, these people relocate so-called problem snakes to areas where they will not come into contact with people.

It is important that genetically distinct and morphologically distinct populations are maintained without the risk of contamination from such translocated snakes.

A WARNING ON ONGOING LIES, DECEPTION AND MISINFORMATION BY WÜSTER AND HIS GANG OF THIEVES

Hoser (2012b and 2013) details extensive criminal, unethical and recklessly unscientific practices by Wolfgang Wüster and his gang of thieves.

While there is no need for me to repeat the material within those papers, I should note that the litany of illegal and unethical actions detailed within those papers is just a tiny fraction of the totality conducted by the obsessive Wüster and his gang.

Most significant of course is his ongoing censorship of my own publications and an attempt to ensure that the wider community do not get access to them.

Specific to Death Adders I should also draw attention to the

following. In 2005 Wüster published a paper that plagiarised the findings of my own earlier papers on Death Adders as well as the findings of my earlier papers on Taipans (*Oxyuranus*) and Mulga Snakes (*Cannia*) (e.g. Hoser 2001).

Plagiarisation, better known as theft of another scientist's data and findings without attribution to the original source is the lowest possible act of any so-called scientist.

In the normal course of events, tenure at a facility such as a university would be immediately terminated if such an act were committed and became known.

Plagiarisation is a form of scientific fraud.

In spite of the widespread knowledge of the repeated plagiarisation of the findings of others by Wüster, he remains a salaried staff member at the University of Bangor, Wales, UK.

For the time being, I'll overlook the ongoing allegations of sexual assault by Wüster of vulnerable young students at the same university.

Of more serious note (if that's possible), I should report here that Wüster continues to aggressively knowingly peddle dangerous and false information about Death Adders globally.

One such example is through his active control of the website known as "The Reptile Database" managed by his close friend, Peter Uetz.

Huge chunks of the otherwise useful website is devoted to attacking myself and others Wüster has an axe to grind against. Webpages under Wüster's direct control routinely give false and misleading information.

For the Death Adders pages, dangerously wrong information is endemic.

By way of example, as recently as 20 June 2014, the webpage for the species "*Acanthophis praelongus*" alleges the species is found in New Guinea and most of Australia (as opposed to the reality that it is confined to Cape York as stated in Hoser, 1998) and that *A. rugosus* of southern New Guinea is a synonym of the species.

Of course as far back as 1998, I established that they were two radically different species and even produced images in the relevant paper to show the fact (Hoser 1998), or for that matter the same is reported by Cogger (2014b).

Also the image on Uetz's "*Acanthophis praelongus*" page is of a bog-standard *Acanthophis antarcticus*, not an *A. praelongus*! This would be obvious to anyone who has read Hoser (1998, 2002) or any of a number of other vaguely accurate books or papers on the subject.

For the species *Acanthophis wellsei*, Hoser 1998, "The Reptile Database" runs with the Wüster lie that the taxon is synonymous with the radically different *A. pyrrhus*. The alleged basis of this position is that the taxon *A. wellsei* was "Not listed by COGGER 2000."

Besides the fact that in science, this position wasn't tenable in 2000, in June 2014 it was even less tenable as the book Cogger 2014 (Cogger 2014b), itself an update and a revision of Cogger (2000) did in fact include *A. wellsei* as a valid species!

Of course the fallback position of Wüster when his lies about Hoser-named species not being valid are too ridiculous to be believed is that I, Raymond Hoser, have somehow accessed someone else's files and stolen their work.

However of note, is that no other herpetological scientists besides myself has ever had their files stolen in illegal armed raids!

Now none of this is mere semantics or so-called nit-picking.

Wrong information about venomous snakes can have potentially fatal consequences.

Different species have quite different venoms and misidentification of dangerously venomous snakes such as Death Adders can have potentially fatal consequences.

The reckless actions of Wüster and his partner in crime Mark

O'Shea spreading wrong information about venomous snakes have already caused at least one avoidable snake bite fatality (Hoser 2013), being that of Luke Yeomans in June 2011.

However several other avoidable snake bite deaths are also linked to the dangerous deliberate misinformation peddled by Wüster's gang throughout the scientific and general communities.

This includes the avoidable deaths of Aleta Stacey also in June 2011 and Karl Berry on 23 April 2013.

All three were snake handlers!

CONFLICT OF INTEREST

There are no conflict of interests in terms of this author and the content of this paper.

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Potentially dangerously reckless misinformation from the website of Wolfgang Wüster's good friend Peter Uetz. Seen here is deliberate misinformation about *Acanthophis praelongus* (top two images) and *Acanthophis wellsei* (bottom image). These screen dumps were downloaded from the web as recently as 20 June 2014. Wüster has flooded Uetz's "The Reptile Database" website with his lies and deception. This also includes by Uetz and Wüster telling people to step outside the zoological code and overwrite valid widely accepted taxon names with their own newly coined patronyms..

Types	holotype: WAM R8886, (KH Burton, no date of collection, but accessioned 26.xi.1945)
Comment	Synonymy: Not listed by COGGER 2000. The name was emended to wellsi as the species was described in honor of Richard Wells. <i>Acanthophis wellsi donnellani</i> HOSER 2002 may be a synonym of <i>A. wellsi</i> (WÜSTER, pers. comm. 15 Dec 2010). Venomous!
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Note: Reference entries followed by a star, are available online.

DICHOTOMOUS KEY TO ALL THE SPECIES AND SUBSPECIES OF DEATH ADDER (GENUS ACANTHOPHIS)

- 1a Ventrals under 118 ... 2
 1b Ventrals over 118 ... 5
- 2a Supralabials mainly black ... *Acanthophis macgregori*
 2b Supralabials not mainly black ... 3
- 3a Infralabials characterised by blotches forming triangles with the apex at the jawline ... *A. laevis*
 3b Infralabials characterised by either medium irregular blotches, or alternatively tiny spots ... *A. groenveldi*. ... 4.
- 4a Infralabials characterised by either medium irregular blotches ... *A. groenveldi groenveldi*.
 4b Infralabials characterised by tiny spots ... *A. groenveldi mumpini*
- 5a 19 dorsal mid-body rows ... *A. wellsei* ... 6
 5b 21 or 23 dorsal mid-body rows ... 8
- 6a Dorsal keeling that is well-developed in scale rows 1-4, but stops abruptly on flanks, and flared supraoculars ... *A. wellsei donnellani*
 6b Dorsal keeling that is not well-developed in scale rows 1-4, and that does not stop abruptly on flanks, and supraoculars not flared ... 7
- 7a Darker dorsal bands wider than the lighter ones or the same width ... *A. wellsei hoserae*
 7b Darker dorsal bands noticeably narrower than the lighter ones ... *A. wellsei wellsei*
- 8a Over 127 ventrals, extremely flattish head and a strongly rugose body (including flanks) and tail ... *A. pyrrhus* ... 9
 8b Body (including flanks) and tail not strongly rugose ... 12
- 9a Body pattern including distinctive yellowish bands ... 10
 9b Body pattern of alternating reddish and orange bands ... 11
- 10a Over 150 ventrals ... *A. pyrrhus armstrongi*
 10b Under 144 ventrals ... *A. pyrrhus maryani*
- 11a Tiny bluish flecks on the dorsum ... *A. pyrrhus pyrrhus*
 11b Lacks tiny bluish flecks on the dorsum ... *A. pyrrhus moorei*

- 12a Anterior dorsal scales smooth or only weakly keeled ... 13
 12b Anterior dorsal scales strongly keeled ... 21
 13a Supraocular moderately to strongly raised, 21 dorsal mid-body rows ... 14
 13b Supraocular not moderately to strongly raised ... 17
 14a Relatively slim build, venter not characterised by dark light edged scales, 21 dorsal mid-body rows ... *A. praelongus*
 14b Relatively stout build, 21 dorsal mid-body rows ... 15
 15a Most of the upper labials and adjacent scales are nearly completely black... *A. macgregori*
 15b Most of the upper labials and adjacent scales are not nearly completely black ... 16
 16a Small spots or peppering on the rear supralabials and temporals ... *A. crotalusei*
 16b Mainly white lower parts of upper labials, with black markings or spots, temporals brownish and without peppering ... *A. barnetti*
 17a Dorsal pattern with relatively ill-defined cross-bands unless snake is puffed up for a defensive display, upper labials have a distinctive creamish bar on the lower margin ... *A. hawkei*
 17b Dorsal pattern with relatively well-defined cross-bands including when snake is puffed up for a defensive display, white markings on the upper labials do not form a distinctive white-creamish bar ... *A. antarcticus* ... 18
 18a White pigment on the upper labials is still prevented from entering the orbit by a distinctive and well-defined zone of dark pigment ... *A. antarcticus granti*
 18b White pigment on the upper labials is not prevented from entering the orbit by a distinctive and well-defined zone of dark pigment or at least comes close to doing so ... 19
 19a The colouration of the upper and lower lip scales (labials) is characterized by about six relatively thick creamy bars, interspersed with five thinner brownish (or greyish) bars which are sometimes slightly darker on the margins, and on the upper labials characterized by about five thinnish white and elongate triangles, the apex facing up, interspersed with initially thicker (at the front of the head), then thinner (towards the rear of the head) inverted triangles of darker pigment that is usually darker towards the rear of the head ... *A. antarcticus schistos*
 19b The colouration of the upper and lower lip scales (labials) is not characterized by about six relatively thick creamy bars, interspersed with five thinner brownish (or greyish) bars which are sometimes slightly darker on the margins, and on the upper labials characterized by about five thinnish white and elongate triangles, the apex facing up, interspersed with initially thicker (at the front of the head), then thinner (towards the rear of the head) inverted triangles of darker pigment that is usually darker towards the rear of the head ... 20.
 20a Lighter triangles on the front upper labials are generally indistinct or even absent, instead being replaced by dark pigment ... *A. antarcticus cliffcrosswellingtoni*
 20b Lighter triangles on the front upper labials are distinct and not replaced by dark pigment ... *A. antarcticus antarcticus*
 21a Venter white and immaculate. Dorsal colouration a combination of reddish and yellowish orange bands, 21 dorsal mid-body rows. Minimal white pigment on the upper labials ... *A. wolffi*
 21b 21-23 mid-body rows. Usually but not always considerable white pigment on the upper labials from within markings from the jawline up ... 22
 22a 21 dorsal mid-body rows, supraoculars not raised, colouration usually but not always with darkening towards the anterior and rugose anterior not being angular ... *A. rugosus*
 22b 23 dorsal mid-body rows ... 23
 23a White triangular zig-zag markings on the lower parts of the upper-labials bordered by darker pigment. Dorsal colour pattern of dark grey to blackish and yellowish-brown cross bands ... *A. cummingi*
 23b No white triangular zig-zag markings on the lower parts of the upper labials, pigment on upper labials variable ... *A. lancasteri* ... 24
 24a Highly raised supraoculars; little or no anterior blackening in colour ... *A. lancasteri lancasteri*
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From a history of genus mergers to an overdue break-up: A new and sensible taxonomy for the Asiatic Wolf Snakes *Lycodon* Boie, 1826 (Serpentes: Colubridae).

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ABSTRACT.

The Asiatic Wolf Snakes genus *Lycodon* Boie, 1826 as currently recognized, consists of about 48 species of which 15 have been formally described in the last 15 years (Neang *et al.* 2014).

These snakes have for most of the last 188 years been treated as being within a single genus, namely *Lycodon* Boie, 1826.

Other authors have proposed generic names for given species or species groups, with most if not all invariably being synonymised with *Lycodon*.

By way of example, the most recent phylogenetic revisions by Siler *et al.* (2013) and Guo *et al.* (2013) merged the long recognized and used genus *Dinodon* Duméril, 1853 within a greater *Lycodon*.

This is a position maintained by most other authors including for example Neang *et al.* (2014).

However a comparison of where the line of divergence is drawn to define a genus between snakes within *Lycodon sensu lato* and other snake genera as currently recognized shows that by any reasonable interpretation *Lycodon* should be split to be consistent with the majority of other genera.

This view is supported by molecular studies of Siler *et al.* (2013), Guo *et al.* (2013) and Grismer *et al.* (2014) if lined up against the comparative order-wide supermatrix constructed by Pyron *et al.* (2013), which clearly shows *Lycodon* as paraphyletic.

As a result of the evidence within these and other studies, including numerous taxonomic ones based on morphology, *Lycodon* as currently recognized is split into seven genera, for which names are available for five. The other two genus groups, *Snakebustersus gen. nov.* and *Apollopierson gen. nov.* are formally named and defined according to the rules of the Zoological Code (Ride *et al.* 1999).

Within various genera five new subgenera are also formally named for the first time and another genus *Cercaspis* Wagler, 1830 is resurrected and treated as being a monotypic subgenus within *Lycodon*.

Also recognized are the following associated genera: *Lepturophis* Boulenger, 1900, *Dryocalamus* Günther, 1858 and *Hydrophobus* Günther, 1862, making a grand total of 10 genera within *Lycodon sensu lato*.

In order to best identify the relationships between all the associated genera a new tribe Snakebustersini *tribe nov.* is erected to accommodate the genera.

Keywords: Taxonomy; Nomenclature; *Lycodon*; *Dinodon*; *Tyleria*; *Ophites*; *Cercaspis*; *Tetragonosoma*; *Leptorhytaon*; *Dryocalamus*; *Hydrophobus*; *Sphecodes*; *Dannyelfakhrikukri*; new tribe; *Snakebustersusini*; new genera; *Snakebustersus*; *Apollopierson*; new subgenera; *Mindanaosnakebustersus*; *Myanmarelfakhari*; *Sinoelfakhari*; *Paralycodon*; *Kotabilycodon*.

INTRODUCTION.

Asiatic Wolf Snakes genus *Lycodon* Boie, 1826 as currently recognized consists of 48 species of which 15 have been formally described in the last 15 years (Neang *et al.* 2014).

These snakes have for most of the last 188 years been treated as being within a single genus, namely *Lycodon* Boie, 1826.

The Latin name *Lycodon* is derived from the Greek words *ἐλύειν* (*lykos*) meaning wolf and *ἄϊν* (*don*) meaning tooth, and refers to

the fang-like anterior maxillary and mandibular teeth (Boulenger, 1893). The genus as currently recognized inhabits most parts of south-east Asia and nearby coastal regions in southern and eastern Asia as well as offshore islands and Indonesia.

Later authors have proposed generic names for given species or species groups, usually without any scientific basis given. As a result, most if not all have invariably been synonymised with *Lycodon*.

By way of example, the most recent phylogenetic revisions by Siler *et al.* (2013) and Guo *et al.* (2013) merged another long recognized and used genus *Dinodon* Duméril, 1853 within a greater *Lycodon*.

This is a position maintained by most other authors including for example Neang *et al.* (2014).

However a comparison of where the line of divergence is drawn to define a genus between snakes within *Lycodon sensu lato* and other snake genera as currently recognized shows that by any reasonable interpretation *Lycodon* should be split to be consistent with the majority of other genera.

This view is supported by molecular studies of Siler *et al.* (2013), Guo *et al.* (2013) and Grismer *et al.* (2014), when cross-referenced with the comparative order-wide supermatrix constructed by Pyron *et al.* (2013), which clearly shows *Lycodon* as paraphyletic.

A global audit of the world's snakes largely completed in 2012, identified *Lycodon* as a genus in need of formal division, but this was not undertaken at the time pending the expected publications of Siler *et al.* (2013) and Guo *et al.* (2013), whom I had expected to make logical taxonomic judgments with regards to the genera within the group.

However these authors, while recognizing the paraphyly of *Lycodon sensu lato*, chose to merge genera rather than maintain divisions and/or add further genera by way of resurrection of old names or by formal description of one or more new genera.

As a result of the evidence within these most recent and other earlier and invariably less complete studies, including numerous taxonomic ones based on morphology, *Lycodon* as currently recognized is split here into seven genera.

There are available names for five of these groups, so in strict compliance with the rules of the Zoological Code, these are used.

The other two genus groups, *Snakebustersus gen. nov.* and *Apollopierson gen. nov.* are formally named and defined according to the rules of the Zoological Code (Ride *et al.* 1999).

Within various genera five new subgenera are also formally named for the first time. *Cercaspis* Wagler, 1830 is also resurrected from synonymy with *Lycodon* and treated as a subgenus within it.

Three other associated genera, commonly lumped within *Lycodon* are also recognized, for which names are available and used herein.

These are *Lepturophis* Boulenger, 1900, *Dryocalamus* Günther, 1858 and *Hydrophobus* Günther, 1862, making a grand total of 10 genera within *Lycodon sensu lato*.

In order to best identify the relationships between the associated genera a new tribe Snakebustersini *tribe nov.* effectively equivalent to *Lycodon sensu lato* is erected to accommodate the genera.

MATERIALS, METHODS AND RESULTS.

The basis of this taxonomy is the audit of all known extant species within the genus *Lycodon* and also genera known to be associated with it, such as *Dryocalamus* Günther, 1858, and *Lepturophis* Boulenger, 1900 which at times have been treated as synonymous with *Lycodon*.

This was done by viewing numerous live specimens, dead specimens and photographs, as well as all major relevant and available publications relevant to the taxa identified as belonging in the genera *Lycodon* and those others at times treated as associated with it or synonymous to it.

Key publications relevant to the taxonomy of *Lycodon* and associated genera include the following: Adler and Zhao (1995), Balete *et al.* (2011), Bickford *et al.* (2007), Boie (1827), Boulenger (1893, 1896, 1899), Bourret (1934, 1935a, 1935b, 1936, 1937, 1939a, 1939b, 1939c, 1939d), Brown and Diesmos (2002, 2009), Brown and Guttman (2002), Brown and Stuart

(2012), Brown *et al.* (2012a, 2012b), Burbrink and Pyron (2008), Burbrink *et al.* (2008), Cadle (1988), Daltry and Wüster (2002), Das (1994, 2003, 2010), David and Vogel (1996), David *et al.* (2008a, 2008b), de Queiroz and Gatesy (2007), Deuve (1970), Diamond and Gilpin (1983), Driskell *et al.* (2004), Dowling (1951), Drummond and Rambaut (2007), Drummond *et al.* (2006), Duméril, (1853), Edgar (2004), Esselstyn and Oliveros (2010), Esselstyn *et al.* (2009, 2010), Evans *et al.* (2003), Ferner *et al.* (2000), Fritz (1993), Gamble *et al.* (2012), Gaulke (2002), Goris and Maeda (2004), Gravlund (2001), Greene (1997), Grismer *et al.* (2007, 2008, 2011, 2014), Grossmann and Tillack (2001a, 2001b), Günther (1858, 1868), Guo *et al.* (2013), Heaney (1985, 1986), Heaney *et al.* (1998, 2005), Heise *et al.* (1995), Hikida *et al.* (1989), Hoser (2000, 2012), IUCN (2014), Jackson and Fritts (2004), Jansa *et al.* (2006), Jones and Kennedy (2008), Kelly *et al.* (2003, 2009), Kraus and Brown (1998), Kuntz (1963), Lanza (1999), Lawson *et al.* (2005), Lee (2005), Lee and Scanlon (2002), Lei *et al.* (2014), Leviton (1955, 1965), Linnaeus (1758), Lue *et al.* (1999), Maki (1931, 1933), Malhorta *et al.* (2011), Marshall (2010), McLeod *et al.* (2011), Mell (1922), Mori (1984), Mukherjee and Bhupathy (2007), Murphy *et al.* (2012), Neang *et al.* (2012, 2014), Nutphand (1986), Orlov *et al.* (2000, 2003), Ota (1998, 1991, 2000), Ota and Ross (1994), Pauwels and Sumontha (2007), Pauwels *et al.* (2000a, 2000b, 2002, 2003, 2004, 2005, 2006), Pfenninger and Schwenk (2007), Philippe *et al.* (2004), Pope (1928, 1929, 1935), Posada (2008), Pyron and Burbrink (2009), Pyron *et al.* (2011, 2013), Rambaut and Drummond (2007), Reza (2010), Rieppel (1988), Ronquist and Huelsenbeck (2003), Saint Girons (1972), Sanderson *et al.* (2003), Siler *et al.* (2010, 2011, 2012a, 2012b, 2012c, 2013), Slowinski and Lawson (2005), Slowinski *et al.* (2001), Smith (1943), Stamatakis (2006), Stamatakis *et al.* (2008), Stejneger (1907), Stuart *et al.* (2006), Stuart and Chuaynkern (2007), Stuebing and Inger (1999), Swofford (1999), Szyndlar and Nguyen (1996), Taylor (1965), Thomson and Shaffer (2010), Toda (1987), Toriba (1982), Toriba and Hikida (1999), Toyama (1985), Tu (2004), Uchiyama *et al.* (2002), Vandeweghe *et al.* (2012), Vidal *et al.* (2007, 2009), Vogel and Brachtel (2008), Vogel and David (2010), Vogel and Luo (2011), Vogel *et al.* (2009, 2012), Wall (1921), Wallach *et al.* (2014), Welton *et al.* (2010), Whitaker and Captain (2004), Wiens *et al.* (2005, 2008), Wilcox *et al.* (2002), Wilgenbusch *et al.* (2004), Zaher (1999), Zaher *et al.* (2009), Zhang *et al.* (2011), Zhao (2002, 2006), Zhao and Adler (1993), Zhao and Jiang (1981), Zhao and Yang (1997), Zhao *et al.* (1998), Ziegler (2002), Ziegler *et al.* (2004, 2007) and sources cited therein.

The results are summarized immediately below.

SUMMARY OF CHANGES.

As a result of this review, I have determined that while *Lycodon sensu lato* is a single monophyletic group, the divisions within the group are of sufficient depth and antiquity to warrant a breakup of the genus as currently understood by most herpetologists at the present time.

Hence many of the past synonymizations of genera by others is in fact reversed here.

To maintain the monophyly of the group, all are herein placed into a single tribe formally named and defined for the first time according to the Zoological Code (Ride *et al.* 1999).

This paper therefore makes the following broad changes are made in terms of the genus *Lycodon sensu lato*.

The genus *Dryocalamus* Günther, 1858 (type species: *D. tristriatus* Günther, 1858) has been shown to be embedded within the group generally regarded as *Lycodon sensu lato*. Notwithstanding this, the divergences between the lineages are sufficient to warrant the genus being recognized. In fact *Dryocalamus* itself consists of two distinct morphological groups and these are herein both recognized at the generic level. Names are available for both, the other group being *Hydrophobus* Günther, 1862 (type species: *Coluber nympha* Daudin, 1803). The Zoological Code does not permit me to

overwrite these little-used names with my own coined names as recently done by others in herpetology.

Dinodon Duméril, 1853 (type species: *Lycodon rufozonatus* Cantor, 1842) has most recently been synonymized with *Lycodon* by Siler *et al.* 2013 and Guo *et al.* 2013. The data relied upon by those authors is not disputed in any way. I note however that Siler *et al.* (2013), Fig. 3, page 268, shows *Dinodon* embedded within a greater *Lycodon sensu lato*, but on its own divergent stem (also seen in Pyron *et al.* 2013). This alone forms a sufficient basis to form the view that *Dinodon* should be recognized at the genus level.

Siler *et al.* (2013), Fig. 3, page 268 also shows *Lycodon sensu lato* forming seven distinct clades (including *Dinodon*) and it is these clades that correspond with the seven genera recognized herein.

Lepturophis Boulenger, 1900 type species, *Sphecodes albofuscus* Duméril, Bibron and Duméril, 1854 often placed in the genus *Lycodon* is herein recognized as generically distinct based on the molecular results of Grismer *et al.* (2014).

If one were to add *Lepturophis*, *Dryocalamus* and *Hydrophobus* to the total, this would mean *Lycodon sensu lato* is herein divided ten ways.

Excluding the genera *Lepturophis*, *Dryocalamus* and *Hydrophobus* these other seven changes at the genus level are as follows:

1/ *Lycodon* (type species: *Coluber aulicus* Linnaeus, 1758) for the so-called *aulicus* group is recognized. Included herein is the taxon *Coluber jara* Shaw, 1802 the type species for the genus *Leptorhytaon* Günther, 1858, which therefore is synonymised at the genus level. *Tytleria* Theobald, 1868 is also formally synonymised within this genus.

Within *Lycodon* the divergent taxon *Lycodon laoensis* Günther, 1864 is herein placed in the newly named subgenus *Paralycodon subgen. nov.*

The divergent taxon, *Lycodon kundui* Smith, 1943 is herein placed in the monotypic subgenus *Kotabilycodon subgen. nov.*

Cercaspis Wagler, 1830 (type species: *Lycodon carinatus*), is also treated as being a monotypic subgenus within *Lycodon*.

2/ The polytypic species *Tetragonosoma effrene* (Cantor, 1847), long treated as being within *Lycodon* is hereby treated as being in a separate genus, as originally described (*Tetragonosoma*).

3/ Following on from the results of Lei *et al.* (2014), the associated so-called *ruhstrati* and *fasciatus* groups are both placed into the genus *Dannyelfakhariukri* Hoser, 2012, in turn divided into three obvious subgenera, the newly named groups being *Myanmarelfakhari subgen. nov.* and *Sinoelfakhari subgen. nov.*

4/ The polytypic species *Lycodon subcinctus* Boie, 1827 is the type species for the genus *Ophites* Wagler, 1830.

5/ *Dinodon* Duméril, 1853 is resurrected to accommodate several species.

6/ The divergent species *Lycodon stormi* Boettger, 1892 from Sulawesi, is herein placed in a newly named genus *Apollopierson gen. nov.*

7/ The Philippine clade including *Lycodon muelleri* Duméril, Bibron and Duméril, 1854 as the type species is herein placed in a new genus *Snakebustersus gen. nov.* which is in turn divided into two subgenera, the second being *Mindanaosnakebustersus subgen. nov.*

In terms of any other names previously applied to *Lycodon* the following is noted:

Sphecodes Duméril and Bibron, 1853 is a preoccupied bee genus and so is not relevant herein.

NOTES ON TAXA NAMED HEREIN.

In the event a later author seeks to merge one or more taxon groups (taxa) described within this paper, the order of priority should be by page priority in terms of this paper; that is the first

name listed is the first to be used. Gender, spellings and the like of names or other perceived errors should not be altered in any way unless mandated by the Zoological Code, even if apparently wrong in the original descriptions herein, including by derivation or gender.

The same (above) directive/s applies to all other taxa described by myself, at all levels, to date (2014) in the period 1998-2014 inclusive.

GENUS LYCODON BOIE, 1826.

Type species: *Coluber aulicus* Linnaeus, 1758.

Diagnosis: The genus *Lycodon* is defined and diagnosed by the following unique suite of characters:

Maxillary bent inwards anteriorly in the adult, the three to six anterior teeth increasing in size, fang-like, and separated by a toothless interspace from the rest, seven to fifteen in number, which increase in size posteriorly; anterior mandibular teeth longest, fang-like. Head not or but slightly distinct from neck, more or less depressed; eye small or moderate in a rounded orbit, with vertically elliptic pupil; nostril large or rather large. Body more or less elongate, cylindrical or slightly compressed; scales smooth or keeled, in 15, 17, 19 or 21 mid-body rows, with apical pits; ventrals with or without a lateral keel. Tail moderate to long; subcaudals and anal plate may be single or divided.

Most species have a distinct or indistinct white or pale brown nuchal collar followed posteriorly by a black to blackish-brown ground color with various white, cream or yellow bands, blotches and speckles (some without pale coloration) on body and tail.

Within this diagnosis (now applicable for the tribe Snakebustersusini *tribe nov.*) several genera until now mainly treated as being within *Lycodon* would also be defined.

In order to separate the relevant genera, including *Lycodon* (by way of a process of elimination of other genera), the relevant genera are herein defined:

Apollopierson gen. nov. are readily separated from all other species of *Lycodon sensu lato* (tribe Snakebustersusini *tribe nov.*) by the following unique suite of characters: 19 dorsal mid body scale rows; all single subcaudals; no loreal; praefrontal in contact with the labials; ventrals laterally angulate; a praecocular separating the eye from the praefrontal; smooth dorsal scales.

The genus is further diagnosed by the following characters: Head strongly depressed; eye small, rostral not much broader than deep, being just visible from above; internasals much shorter than the praefrontals; the latter longer than broad; frontal as long as the internasals and praefrontals together, much shorter than the parietals; loreal large, nearly as deep as long, not entering the eye; one praecocular, not reaching the frontal; two postoculars; temporals 1+3; eight upper labials, third and fourth entering the eye; five lower labials in contact with the anterior chin-shields,

which are longer than the posterior. Scales smooth, in 19 dorsal mid body scale rows, about 217 ventrals 217, angulate laterally; anal entire; subcaudals about 75, all single. Slate-colour, with whitish annuli, which are most marked on the lower surface (adapted from Boulenger, 1893).

The genus *Snakebustersus gen. nov.* are readily separated from all other *Lycodon sensu lato* (tribe Snakebustersusini *tribe nov.*) by the following suite of characters: 17 dorsal mid-body scale rows; all the dorsals are smooth or with more or less developed keels only in the posterior part of the body; subcaudals number more than 100.

Dinodon Duméril, 1853 is diagnosed and separated from all other *Lycodon sensu lato* (tribe Snakebustersusini *tribe nov.*) by the following suite of characters:

Maxillary teeth 6+2 or 3+2 or 3, the anterior gradually increasing in size, the middle ones small, the last large, the three groups separated by distinct interspaces; anterior mandibular teeth enlarged. Head slightly distinct from neck; eye rather small, with vertically elliptic pupil. Body more or less elongate; scales

smooth or feebly keeled, with apical pits, in 17 (or 21) rows; ventrals angulate laterally. Tail moderate; subcaudals divided. The snakes in the genus *Ophites* Wagler, 1830 are separated from all other *Lycodon sensu lato* (tribe Snakebustersusini *tribe nov.*) by the following suite of characters:

Mid-body scales in 17 rows; at least some dorsal scale rows are keeled along the whole body (keels sometimes scarcely visible or invisible on the scales which have lost their outermost layer); dorsal scales except for those forming outermost rows more or less weakly keeled, each keel without serrations; preocular absent; prefrontal entering eye; loreal entering eye; 8 upper labials; anal usually divided, but rarely entire; 192-230 ventrals (males 192-212, females 213-230; angulate laterally); 60-90 paired subcaudals (males 60-78, females 78-90); cross-bands at least in the juveniles, the adults tend to lose them.

The genus *Dannyelfakharikukri* Hoser, 2012 is separated from all other *Lycodon sensu lato* (tribe Snakebustersusini *tribe nov.*) by the following unique suite of characters:

17 mid-body scale rows; at least some dorsal scale rows are keeled along the whole body (keels sometimes scarcely visible or invisible on the scales which have lost their outermost layer); dorsal scales except for those forming outermost rows are more or less weakly keeled, each keel without serrations; preocular present, prefrontal not entering the eye.

The genus *Tetragonosoma* Günther, 1858 is separated from all other *Lycodon sensu lato* (tribe Snakebustersusini *tribe nov.*) by the following unique suite of characters:

17 mid-body scale rows; all the dorsals are smooth or with more or less developed keels only in the posterior part of the body; less than 100 subcaudals; no loreal; praefrontal in contact with the labials; three labials enter the eye; 215-228 ventrals.

The genus *Dryocalamus* Günther, 1858 is separated from all other *Lycodon sensu lato* (tribe Snakebustersusini *tribe nov.*) by the following unique suite of characters:

Maxillary teeth 8 to 10, rather short but stout, increasing in size posteriorly; anterior mandibular teeth a little longer than the posterior; one or two more or less distinct tooth-like knobs on the basisphenoid; head distinct from neck, much depressed; eye moderate or rather large, with vertically elliptic pupil; body slender, slightly compressed; scales smooth, in 13 or 15 rows, with apical pits: ventrals strongly keeled on each side. Tail moderate; subcaudals in two rows. No praeocular.

The genus *Hydrophobus* Günther, 1862, is essentially physically identical in most respects to the genus *Dryocalamus* (as just described) but specimens are readily separated from that genus by the presence of one or two praeoculars.

The genus *Lepturophis* Boulenger, 1900 is separated from all other *Lycodon sensu lato* (tribe Snakebustersusini *tribe nov.*) by the following unique suite of characters:

Scales strongly keeled; 17 mid-body scale rows; 155-208 all divided subcaudals; a praeocular, separating the eye from the praefrontal.

The genus is further diagnosed as follows:

Snout moderately depressed, not spatulate; eye moderate. Rostral broader than deep, just visible from above; internasals half as long as the praefrontals; frontal as long as broad, as long as the praefrontals or a little longer, much shorter than the parietals; loreal a little longer than deep, not entering the eye; one prae and two postoculars; temporals 2+2; eight upper labials, third, fourth, and fifth entering the eye; five lower labials in contact with the anterior chin-shields, which are a little shorter than the posterior. Body very slender. Scales in 17 rows, all strongly keeled. Ventrals 238-256, strongly angulate laterally; anal

divided; subcaudals 155-208 all paired. Blackish brown above, young with yellow cross bands; yellowish beneath.

Distribution: South and south-east Asia.

Content: *Lycodon aulicus* (Linnaeus, 1758) (type species); *L. capucinus* (Boie, 1827); *L. carinatus* (Kuhl, 1820); *L. flavicollis*

Mukerjee and Bhupathy, 2007; *L. flavomaculatus* Wall, 1907; *L. hypsirhinoides* (Theobald, 1868); *L. jara* (Shaw, 1802); *L. kundui* Smith, 1943; *L. laoensis* (Günther, 1864); *L. mackinnoni* Wall, 1906; *L. osmanhilli* Taylor, 1950; *L. striatus* (Shaw, 1802); *L. tessellatus* Jan, 1863; *L. travancoricus* (Beddome, 1870); *L. tiwarii* Biswas and Sanyal, 1965; *L. zawi* Slowinski, Pawar, Win, Thin, Gyi, Oo and Tun, 2001.

SUBGENUS PARALYCODON SUBGEN. NOV.

Type species: *Lycodon laoensis* Günther, 1864.

Diagnosis: The subgenus *Paralycodon subgen. nov.* is separated from all other *Lycodon sensu lato* (tribe Snakebustersusini *tribe nov.*) including other *Lycodon* species by the following unique suite of characters:

All the dorsal scales are smooth or with more or less developed keels only in the posterior part of the body; dorsal pattern is banded with light cross-bands which may be pure white at least anteriorly;

nasal usually divided; anal usually divided, rarely entire; ventrals more or less angulate laterally; nasal usually divided with the anterior portion larger than or subequal to the posterior one; anterior chin shields 2 to 3 times longer than the posterior ones; loreal present and not in, or in short (rarely strong) contact with internasal; usually 9, sometimes 10 upper labials; 163-192 ventrals; 60-76 paired subcaudals, 17 mid-body scale rows.

Species within this subgenus and all other *Lycodon sensu lato* (tribe Snakebustersusini *tribe nov.*) are also defined as follows:

Maxillary bent inwards anteriorly in the adult, the three to six anterior teeth increasing in size, fang-like, and separated by a toothless interspace from the rest, seven to fifteen in number, which increase in size posteriorly; anterior mandibular teeth longest, fang-like. Head not or but slightly distinct from neck, more or less depressed; eye small or moderate in a rounded orbit, with vertically elliptic pupil; nostril large or rather large. Body more or less elongate, cylindrical or slightly compressed; scales smooth or keeled, in 15, 17, 19 or 21 mid-body rows, with apical pits; ventrals with or without a lateral keel. Tail moderate to long; subcaudals and anal plate may be single or divided.

Most species have a distinct or indistinct white or pale brown nuchal collar followed posteriorly by a black to blackish-brown ground color with various white, cream or yellow bands, blotches and speckles (some without pale coloration) on body and tail.

Distribution: Mainly Indo-China including India, Thailand, Laos, Vietnam, Cambodia, China (Yunnan) and West Malaysia.

Etymology: Named in reflection of the fact that this subgenus does "not quite" fit within the typical species group for the genus, that being species associated with the type species *Lycodon aulicus* (Linnaeus, 1758).

Content: *Lycodon (Paralycodon) laoensis* Günther, 1864 (monotypic).

SUBGENUS KOTABILYCODON SUBGEN. NOV.

Type species: *Lycodon kundui* Smith, 1943.

Diagnosis: The subgenus *Kotabilycodon subgen. nov.* is separated from all other *Lycodon sensu lato* (tribe Snakebustersusini *tribe nov.*) including other *Lycodon* species by the following unique suite of characters: 15 mid-body scale rows; ventrals strongly angulate laterally; 7 upper labials; loreal not entering the eye; dorsals smooth; anal entire; 186 ventrals; 70 paired subcaudals; cross-bars present.

Species within this subgenus and all other *Lycodon sensu lato* (tribe Snakebustersusini *tribe nov.*) are also defined as follows:

Maxillary bent inwards anteriorly in the adult, the three to six anterior teeth increasing in size, fang-like, and separated by a toothless interspace from the rest, seven to fifteen in number, which increase in size posteriorly; anterior mandibular teeth longest, fang-like. Head not or but slightly distinct from neck, more or less depressed; eye small or moderate in a rounded orbit, with vertically elliptic pupil; nostril large or rather large. Body more or less elongate, cylindrical or slightly compressed;

scales smooth or keeled, in 15, 17, 19 or 21 mid-body rows, with apical pits; ventrals with or without a lateral keel. Tail moderate to long; subcaudals and anal plate may be single or divided.

Most species have a distinct or indistinct white or pale brown nuchal collar followed posteriorly by a black to blackish-brown ground color with various white, cream or yellow bands, blotches and speckles (some without pale coloration) on body and tail.

Distribution: Only known from Myanmar (= Burma) (Pegu Division).

Etymology: Named in honour of Kotabi Publishing, publishers of the book *Smuggled-2: Wildlife Trafficking, Crime and Corruption in Australia*, (Hoser 1996), which led to the rewriting of ridiculously draconian and anti-conservation wildlife laws in all parts of Australia. This included for the first time in decades allowing private individuals in Australia the legal right to keep live reptiles and other animals as pets without inherent fear of armed police raids and long-term imprisonment.

Content: *Lycodon (Kotabilycodon) kundui* Smith, 1943 (monotypic).

SUBGENUS *CERCASPIS* WAGLER, 1830.

Type species: *Hurria carinata* Kuhl, 1820.

Diagnosis: The subgenus *Cercaspis* Wagler, 1830 is separated from all other *Lycodon sensu lato* (tribe Snakebustersusini *tribe nov.*) including other *Lycodon* species by the following unique suite of characters:

19 mid-body rows; scales strongly keeled; subcaudals single; a praeocular, separating the eye from the praefrontal.

Species within this subgenus and all other *Lycodon sensu lato* (tribe Snakebustersusini *tribe nov.*) are also defined as follows:

Maxillary bent inwards anteriorly in the adult, the three to six anterior teeth increasing in size, fang-like, and separated by a toothless interspace from the rest, seven to fifteen in number, which increase in size posteriorly; anterior mandibular teeth longest, fang-like. Head not or but slightly distinct from neck, more or less depressed; eye small or moderate in a rounded orbit, with vertically elliptic pupil; nostril large or rather large.

Body more or less elongate, cylindrical or slightly compressed; scales smooth or keeled, in 15, 17, 19 or 21 mid-body rows, with apical pits; ventrals with or without a lateral keel. Tail moderate to long; subcaudals and anal plate may be single or divided.

Most species have a distinct or indistinct white or pale brown nuchal collar followed posteriorly by a black to blackish-brown ground color with various white, cream or yellow bands, blotches and speckles (some without pale coloration) on body and tail.

Distribution: Sri Lanka.

Content: *Lycodon (Cercaspis) carinatus* (Kuhl, 1820) (monotypic).

SUBGENUS *LYCODON* BOIE, 1826.

Type species: *Coluber alicus* Linnaeus, 1758.

Diagnosis: The subgenus *Lycodon* Boie, 1826 is separated from all other *Lycodon sensu lato* (tribe Snakebustersusini *tribe nov.*) including other *Lycodon* species by the elimination of the three other subgenera.

The subgenus *Paralycodon subgen. nov.* is separated from all other *Lycodon sensu lato* (tribe Snakebustersusini *tribe nov.*) including other *Lycodon* species by the following unique suite of characters:

All the dorsal scales are smooth or with more or less developed keels only in the posterior part of the body; dorsal pattern is banded with light cross-bands which may be pure white at least anteriorly;

nasal usually divided; anal usually divided, rarely entire; ventrals more or less angulate laterally; nasal usually divided, anterior portion larger than or subequal to the posterior one; anterior chin shields 2 to 3 times longer than the posterior ones; loreal present and not in, or in short (rarely strong) contact with internasal; usually 9, sometimes 10 upper labials; 163-192

ventrals; 60-76 paired subcaudals, 17 mid-body scale rows.

The subgenus *Kotabilycodon subgen. nov.* is separated from all other *Lycodon sensu lato* (tribe Snakebustersusini *tribe nov.*) including other *Lycodon* species by the following unique suite of characters: 15 mid-body scale rows; ventrals strongly angulate laterally; 7 upper labials; loreal not entering the eye; dorsals smooth; anal entire; 186 ventrals; 70 paired subcaudals; cross-bars present.

The subgenus *Cercaspis* Wagler, 1830 is separated from all other *Lycodon sensu lato* (tribe Snakebustersusini *tribe nov.*) including other *Lycodon* species by the following unique suite of characters:

19 mid-body rows; scales strongly keeled; subcaudals single; a praeocular, separating the eye from the praefrontal.

Distribution: South and south-east Asia.

Content: *Lycodon (Lycodon) alicus* (Linnaeus, 1758) (type species); *L. (Lycodon) capucinus* (Boie, 1827); *L. (Lycodon) flavicollis* Mukerjee and Bhupathy, 2007; *L. (Lycodon) flavomaculatus* Wall, 1907; *L. (Lycodon) hypsirrhinoides* (Theobald, 1868); *L. (Lycodon) jara* (Shaw, 1802); *L. (Lycodon) mackinnoni* Wall, 1906; *L. (Lycodon) osmanhilli* Taylor, 1950; *L. (Lycodon) striatus* (Shaw, 1802); *L. (Lycodon) tessellatus* Jan, 1863; *L. (Lycodon) travancoricus* (Beddome, 1870); *L. (Lycodon) tiwarii* Biswas and Sanyal, 1965; *L. (Lycodon) zawi* Slowinski, Pawar, Win, Thin, Gyi, Oo and Tun, 2001.

GENUS *DINODON* DUMÉRIL, 1853.

Type species: *Lycodon rufozonatus* Cantor, 1842.

Diagnosis: *Dinodon* Duméril, 1853 is diagnosed and separated from all other *Lycodon sensu lato* (tribe Snakebustersusini *tribe nov.*) by the following suite of characters:

Maxillary teeth 6+2 or 3+2 or 3, the anterior gradually increasing in size, the middle ones small, the last large, the three groups separated by distinct interspaces; anterior mandibular teeth enlarged. Head slightly distinct from neck; eye rather small, with vertically elliptic pupil. Body more or less elongate; scales smooth or feebly keeled, with apical pits, in 17 (or 21) rows; ventrals angulate laterally. Tail moderate; subcaudals divided.

Species within this genus and all other *Lycodon sensu lato* (tribe Snakebustersusini *tribe nov.*) are also defined as follows:

Maxillary bent inwards anteriorly in the adult, the three to six anterior teeth increasing in size, fang-like, and separated by a toothless interspace from the rest, seven to fifteen in number, which increase in size posteriorly; anterior mandibular teeth longest, fang-like. Head not or but slightly distinct from neck, more or less depressed; eye small or moderate in a rounded orbit, with vertically elliptic pupil; nostril large or rather large. Body more or less elongate, cylindrical or slightly compressed; scales smooth or keeled, in 15, 17, 19 or 21 mid-body rows, with apical pits; ventrals with or without a lateral keel. Tail moderate to long; subcaudals and anal plate may be single or divided.

Most species have a distinct or indistinct white or pale brown nuchal collar followed posteriorly by a black to blackish-brown ground color with various white, cream or yellow bands, blotches and speckles (some without pale coloration) on body and tail.

Distribution: East Asia.

Content: *Dinodon rufozonatus* (Cantor, 1842) (type species); *D. flavozonatum* Pope, 1928; *D. formosana* (Boettger, 1885); *D. futsingensis* Pope, 1928; *D. meridionale* (Bourett, 1935); *D. orientalis* (Hilgendorf, 1880); *D. semicarinatus* (Cope, 1860); *D. septentrionalis* (Günther, 1875).

GENUS *OPHITES* WAGLER, 1830.

Type species: *Lycodon subcinctus* Boie, 1827.

Diagnosis: The snakes in the genus *Ophites* Wagler, 1830 are separated from all other *Lycodon sensu lato* (tribe Snakebustersusini *tribe nov.*) by the following suite of characters:

Mid-body scales in 17 rows; at least some dorsal scale rows are keeled along the whole body (keels sometimes scarcely visible

or invisible on the scales which have lost their outermost layer); dorsal scales except for those forming outermost rows more or less weakly keeled, each keel without serrations; preocular absent; prefrontal entering eye; loreal entering eye; 8 upper labials; anal usually divided, but rarely entire; 192-230 ventrals (males 192-212, females 213-230; angulate laterally); 60-90 paired subcaudals (males 60-78, females 78-90); cross-bands at least in the juveniles, the adults tend to lose them.

Species within this genus and all other *Lycodon sensu lato* (tribe Snakebustersusini *tribe nov.*) are also defined as follows:

Maxillary bent inwards anteriorly in the adult, the three to six anterior teeth increasing in size, fang-like, and separated by a toothless interspace from the rest, seven to fifteen in number, which increase in size posteriorly; anterior mandibular teeth longest, fang-like. Head not or but slightly distinct from neck, more or less depressed; eye small or moderate in a rounded orbit, with vertically elliptic pupil; nostril large or rather large. Body more or less elongate, cylindrical or slightly compressed; scales smooth or keeled, in 15, 17, 19 or 21 mid-body rows, with apical pits; ventrals with or without a lateral keel. Tail moderate to long; subcaudals and anal plate may be single or divided.

Most species have a distinct or indistinct white or pale brown nuchal collar followed posteriorly by a black to blackish-brown ground color with various white, cream or yellow bands, blotches and speckles (some without pale coloration) on body and tail.

Distribution: Widespread in East Asia, including parts of Indo-China, Indonesia, the Philippines.

Content: *Ophites subcinctus* (Boie, 1827) (type species); *O. cardamomensis* (Daltry and Wüster, 2002).

GENUS DANNYELFAKHARIKUKRI HOSER, 2012.

Type species: *Oligodon multizonatus* Zhao and Jiang, 1981.

Diagnosis: Separation of this genus from all other genera in the tribe Oligodonini Hoser, 2012 is defined by Hoser (2012).

At the time the genus was defined by Hoser (2012), it was thought to be monotypic for the type species originally described as "*Oligodon multizonatus* Zhao and Jiang, 1981".

Lei *et al.* (2014) showed this species to be a part of the *Lycodon sensu lato* (tribe Snakebustersusini *tribe nov.*) and closely related to other relatively well-known species.

As there is no earlier available name for that clade, the name *Dannyelfakhariukri* Hoser, 2012 is to be used for that group.

The genus *Dannyelfakhariukri* Hoser, 2012 is separated from all other *Lycodon sensu lato* (tribe Snakebustersusini *tribe nov.*) by the following unique suite of characters:

17 mid-body scale rows; at least some dorsal scale rows are keeled along the whole body (keels sometimes scarcely visible or invisible on the scales which have lost their outermost layer); dorsal scales except for those forming outermost rows are more or less weakly keeled, each keel without serrations; preocular present, prefrontal not entering the eye.

Species within this genus and all other *Lycodon sensu lato* (tribe Snakebustersusini *tribe nov.*) are also defined as follows:

Maxillary bent inwards anteriorly in the adult, the three to six anterior teeth increasing in size, fang-like, and separated by a toothless interspace from the rest, seven to fifteen in number, which increase in size posteriorly; anterior mandibular teeth longest, fang-like. Head not or but slightly distinct from neck, more or less depressed; eye small or moderate in a rounded orbit, with vertically elliptic pupil; nostril large or rather large. Body more or less elongate, cylindrical or slightly compressed; scales smooth or keeled, in 15, 17, 19 or 21 mid-body rows, with apical pits; ventrals with or without a lateral keel. Tail moderate to long; subcaudals and anal plate may be single or divided.

Most species have a distinct or indistinct white or pale brown nuchal collar followed posteriorly by a black to blackish-brown ground color with various white, cream or yellow bands, blotches and speckles (some without pale coloration) on body and tail.

Distribution: East and southern Asia.

Content: *Dannyelfakhariukri multizonatum* (Zhao and Jiang, 1981) (type species); *D. butleri* (Boulenger, 1900); *D. cavernicolus* Grismer, Quah, Muin, Wood and Aziza, 2014; *D. davidi* (David, Vogel, Nguyen, Kingsda and Ziegler, 2012); *D. fasciatus* (Anderson, 1879); *D. gammiei* (Blanford, 1878); *D. gongshan* Vogel and Luo, 2011; *D. liuchengchaoi* (Zhang, Jiang, Vogel and Rao, 2011); *D. multifasciatus* (Maki, 1931); *D. ophiophagus* (Vogel, David, Pauwels, Sumontha, Norval, Hendrix, Vu and Ziegler, 2009); *D. paucifasciatus* (Rendahl, 1943); *D. ruhstrati* (Fischer, 1886); *D. synaptor* (Vogel and David, 2010); *D. zoosvictoriae* (Neang, Hartmann, Hun, Souter and Furey, 2014).

SUBGENUS MYANMARELFAKHARI SUBGEN. NOV.

Type species: *Ophites fasciatus* Anderson, 1879.

Diagnosis: The subgenus *Myanmarelfakhari subgen. nov.* is separated from all other *Lycodon sensu lato* (tribe Snakebustersusini *tribe nov.*) by the following unique suite of characters:

17 mid-body scale rows; at least some dorsal scale rows keeled along the whole body (keels sometimes scarcely visible or invisible on the scales which have lost their outermost layer); dorsal scales except for those forming outermost rows more or less weakly keeled, each keel without serrations; preocular present, prefrontal not entering eye; loreal entering eye (rarely excluded from it in *Dannyelfakhariukri fasciatus*); posterior chin shields as long as or much longer than the anterior ones.

The subgenus *Dannyelfakhariukri subgen. nov.* would ordinarily key out as *Myanmarelfakhari subgen. nov.* but may be separated from that subgenus by having 7 (rarely 8 on one side only) supralabials, instead of 8 or 9 supralabials; the third and fourth or the third to fifth entering eye; 8 instead of nine infralabials; divided anal (instead of a single anal in *Myanmarelfakhari subgen. nov.*); more than 40 well-defined yellow rings or bars evenly spaced along the entire length of the black body, and more than 10 yellow rings or bars evenly spaced along the black tail; the hemipenis has no nick at the tip (versus a nick at the tip in *Myanmarelfakhari subgen. nov.*).

Species within this subgenus and all other *Lycodon sensu lato* (tribe Snakebustersusini *tribe nov.*) are also defined as follows:

Maxillary bent inwards anteriorly in the adult, the three to six anterior teeth increasing in size, fang-like, and separated by a toothless interspace from the rest, seven to fifteen in number, which increase in size posteriorly; anterior mandibular teeth longest, fang-like. Head not or but slightly distinct from neck, more or less depressed; eye small or moderate in a rounded orbit, with vertically elliptic pupil; nostril large or rather large. Body more or less elongate, cylindrical or slightly compressed; scales smooth or keeled, in 15, 17, 19 or 21 mid-body rows, with apical pits; ventrals with or without a lateral keel. Tail moderate to long; subcaudals and anal plate may be single or divided.

Most species have a distinct or indistinct white or pale brown nuchal collar followed posteriorly by a black to blackish-brown ground color with various white, cream or yellow bands, blotches and speckles (some without pale coloration) on body and tail.

Distribution: East and south Asia.

Etymology: Named in reflection of both the center of distribution of the snakes as well as a derivative of the original genus name.

Content: *Dannyelfakhariukri (Myanmarelfakhari) fasciatus* (Anderson, 1879) (type species); *D. (Myanmarelfakhari) butleri* (Boulenger, 1900); *D. (Myanmarelfakhari) cavernicolus* Grismer, Quah, Muin, Wood and Aziza, 2014; *D. (Myanmarelfakhari) gammiei* (Blanford, 1878); *D. (Myanmarelfakhari) gongshan* Vogel and Luo, 2011; *D. (Myanmarelfakhari) synaptor* (Vogel and David, 2010); *D. (Myanmarelfakhari) zoosvictoriae* (Neang, Hartmann, Hun, Souter and Furey, 2014).

SUBGENUS SINOELFAKHARI SUBGEN. NOV.

Type species: *Ophites ruhstrati* Fischer, 1886.

Diagnosis: The subgenus *Sinoelfakhari subgen. nov.* is separated from all other *Lycodon sensu lato* (tribe

Snakebustersusini *tribe nov.*) by the following unique suite of characters:

17 mid-body scale rows; at least some dorsal scale rows keeled along the whole body (keels sometimes scarcely visible or invisible on the scales which have lost their outermost layer); dorsal scales except for those forming outermost rows more or less weakly keeled, each keel without serrations; preocular present, prefrontal not entering eye; loreal usually wedged between preocular and third upper labial, but rarely entering eye; posterior chin shields a little shorter than anterior ones.

Species within this subgenus and all other *Lycodon sensu lato* (tribe Snakebustersusini *tribe nov.*) are also defined as follows:

Maxillary bent inwards anteriorly in the adult, the three to six anterior teeth increasing in size, fang-like, and separated by a toothless interspace from the rest, seven to fifteen in number, which increase in size posteriorly; anterior mandibular teeth longest, fang-like. Head not or but slightly distinct from neck, more or less depressed; eye small or moderate in a rounded orbit, with vertically elliptic pupil; nostril large or rather large. Body more or less elongate, cylindrical or slightly compressed; scales smooth or keeled, in 15, 17, 19 or 21 mid-body rows, with apical pits; ventrals with or without a lateral keel. Tail moderate to long; subcaudals and anal plate may be single or divided.

Most species have a distinct or indistinct white or pale brown nuchal collar followed posteriorly by a black to blackish-brown ground color with various white, cream or yellow bands, blotches and speckles (some without pale coloration) on body and tail.

Distribution: East Asia.

Etymology: Named in reflection of both the center of distribution of the snakes as well as a derivative of the original genus name.

Content: *Dannyelfakharikukri* (*Sinoelfakhari*) *ruhstrati* (Fischer, 1886) (type species); *D. (Sinoelfakhari) davidi* (David, Vogel, Nguyen, Kingsda and Ziegler, 2012); *D. (Sinoelfakhari) multifasciatus* (Maki, 1931); *D. (Sinoelfakhari) ophiophagus* (Vogel, David, Pauwels, Sumontha, Norval, Hendrix, Vu and Ziegler, 2009); *D. (Sinoelfakhari) paucifasciatus* (Rendahl, 1943).

SUBGENUS DANNYELFAKHARIKUKRI SUBGEN. NOV.

Type species: *Oligodon multizonatus* Zhao and Jiang, 1981.

Diagnosis: This subgenus would ordinarily key out as *Myanmarelfakhari subgen. nov.* but may be separated from it by having 7 (rarely 8 on one side only) supralabials instead of 8 or 9 supralabials; the third and fourth or the third to fifth entering eye; 8 instead of nine infralabials; divided anal (instead of a single anal in *Myanmarelfakhari subgen. nov.*); more than 40 well-defined yellow rings or bars evenly spaced along the entire length of the black body, and more than 10 yellow rings or bars evenly spaced along the black tail; the hemipenis has no nick at the tip (versus a nick at the tip in *Myanmarelfakhari subgen. nov.*).

The subgenus *Myanmarelfakhari subgen. nov.* is separated from all other *Lycodon sensu lato* (tribe Snakebustersusini *tribe nov.*) by the following unique suite of characters:

17 mid-body scale rows; at least some dorsal scale rows keeled along the whole body (keels sometimes scarcely visible or invisible on the scales which have lost their outermost layer); dorsal scales except for those forming outermost rows more or less weakly keeled, each keel without serrations; preocular present, prefrontal not entering eye; loreal entering eye (rarely excluded from it in *Dannyelfakharikukri fasciatus*); posterior chin shields as long as or much longer than the anterior ones.

The subgenus *Sinoelfakhari subgen. nov.* is separated from all other *Lycodon sensu lato* (tribe Snakebustersusini *tribe nov.*) by the following unique suite of characters:

17 mid-body scale rows; at least some dorsal scale rows keeled along the whole body (keels sometimes scarcely visible or invisible on the scales which have lost their outermost layer); dorsal scales except for those forming outermost rows more or

less weakly keeled, each keel without serrations; preocular present, prefrontal not entering eye; loreal usually wedged between preocular and third upper labial, but rarely entering eye; posterior chin shields a little shorter than anterior ones.

Species within this subgenus and all other *Lycodon sensu lato* (tribe Snakebustersusini *tribe nov.*) are also defined as follows:

Maxillary bent inwards anteriorly in the adult, the three to six anterior teeth increasing in size, fang-like, and separated by a toothless interspace from the rest, seven to fifteen in number, which increase in size posteriorly; anterior mandibular teeth longest, fang-like. Head not or but slightly distinct from neck, more or less depressed; eye small or moderate in a rounded orbit, with vertically elliptic pupil; nostril large or rather large. Body more or less elongate, cylindrical or slightly compressed; scales smooth or keeled, in 15, 17, 19 or 21 mid-body rows, with apical pits; ventrals with or without a lateral keel. Tail moderate to long; subcaudals and anal plate may be single or divided.

Most species have a distinct or indistinct white or pale brown nuchal collar followed posteriorly by a black to blackish-brown ground color with various white, cream or yellow bands, blotches and speckles (some without pale coloration) on body and tail.

Distribution: China.

Content: *Dannyelfakharikukri* (*Dannyelfakharikukri*) *multizonatum* (Zhao and Jiang, 1981) (type species); *D. (Dannyelfakharikukri) liuchengchaoi* (Zhang, Jiang, Vogel and Rao, 2011).

GENUS APOLLOPIERSON GEN. NOV.

Type species: *Lycodon stormi* Boettger, 1892.

Diagnosis: Because the genus is monotypic for the species, the diagnosis for the genus is at the present time the same as for the species.

Apollopierson gen. nov. are readily separated from all other species of *Lycodon sensu lato* (tribe Snakebustersusini *tribe nov.*) by the following unique suite of characters: 19 dorsal mid body scale rows; all single subcaudals; no loreal; praefrontal in contact with the labials; ventrals laterally angulate; a praeocular separating the eye from the praefrontal; smooth dorsal scales.

The genus is further diagnosed by the following characters: Head strongly depressed; eye small, rostral not much broader than deep, being just visible from above; internasals much shorter than the praefrontals; the latter longer than broad; frontal as long as the internasals and praefrontals together, much shorter than the parietals; loreal large, nearly as deep as long, not entering the eye; one praeocular, not reaching the frontal; two postoculars; temporals 1+3; eight upper labials, third and fourth entering the eye; five lower labials in contact with the anterior chin-shields, which are longer than the posterior. Scales smooth, in 19 dorsal mid body scale rows, about 217 ventrals 217, angulate laterally; anal entire; subcaudals about 75, all single. Slate-colour, with whitish annuli, which are most marked on the lower surface (adapted from Boulenger, 1893).

Species within this genus and all other *Lycodon sensu lato* (tribe Snakebustersusini *tribe nov.*) are also defined as follows:

Maxillary bent inwards anteriorly in the adult, the three to six anterior teeth increasing in size, fang-like, and separated by a toothless interspace from the rest, seven to fifteen in number, which increase in size posteriorly; anterior mandibular teeth longest, fang-like. Head not or but slightly distinct from neck, more or less depressed; eye small or moderate in a rounded orbit, with vertically elliptic pupil; nostril large or rather large. Body more or less elongate, cylindrical or slightly compressed; scales smooth or keeled, in 15, 17, 19 or 21 mid-body rows, with apical pits; ventrals with or without a lateral keel. Tail moderate to long; subcaudals and anal plate may be single or divided.

Most species have a distinct or indistinct white or pale brown nuchal collar followed posteriorly by a black to blackish-brown ground color with various white, cream or yellow bands, blotches and speckles (some without pale coloration) on body and tail.

Distribution: Known only from Sulawesi, Indonesia.

Etymology: Named in honour of the publishing company Apollo Publishing, and the owner Charles Pierson, of Moss Vale, NSW, Australia, who bravely published the books, *Australian Reptiles and Frogs* (Hoser 1989), *Endangered Animals of Australia* (Hoser 1991) and most notably *Smuggled: The Underground Trade in Australia's Wildlife* (Hoser 1993), which exposed serious corruption and misconduct involving government run-businesses and the circumstances underpinning the ban on private ownership of live reptiles in Australia.

As a direct result of Pierson's efforts as publisher of these books, the laws in Australia were re-written to allow private individuals the right to keep as pets and study live reptiles in Australia.

Content: *Apollopierson stormi* Boettger, 1892 (monotypic).

GENUS SNAKEBUSTERSUS GEN. NOV.

Type species: *Lycodon muelleri* Duméril, Bibron and Duméril, 1854.

Diagnosis: The genus *Snakebustersus gen. nov.* are readily separated from all other *Lycodon sensu lato* (tribe Snakebustersusini tribe nov.) by the following suite of characters: 17 dorsal mid-body scale rows; all the dorsals are smooth or with more or less developed keels only in the posterior part of the body; subcaudals number more than 100.

Species within this genus and all other *Lycodon sensu lato* (tribe Snakebustersusini tribe nov.) are also defined as follows:

Maxillary bent inwards anteriorly in the adult, the three to six anterior teeth increasing in size, fang-like, and separated by a toothless interspace from the rest, seven to fifteen in number, which increase in size posteriorly; anterior mandibular teeth longest, fang-like. Head not or but slightly distinct from neck, more or less depressed; eye small or moderate in a rounded orbit, with vertically elliptic pupil; nostril large or rather large. Body more or less elongate, cylindrical or slightly compressed; scales smooth or keeled, in 15, 17, 19 or 21 mid-body rows, with apical pits; ventrals with or without a lateral keel. Tail moderate to long; subcaudals and anal plate may be single or divided.

Most species have a distinct or indistinct white or pale brown nuchal collar followed posteriorly by a black to blackish-brown ground color with various white, cream or yellow bands, blotches and speckles (some without pale coloration) on body and tail.

Distribution: Restricted to the Philippines.

Etymology: The genus (and tribe with the name taken from this genus) are named in recognition of the many years of valuable conservation work undertaken by the dedicated team of zoologists at Snakebusters, Australia's best reptile displays.

The Snakebusters team includes the following individuals, Andrew Wilson, Michael Smyth, Christian Pillot, Tom Cotton, Louise McGoldrick, Simon McGoldrick, Dylan Mullins, Peter Whybrow, Judy Fergusson, Demi Perkins, Dara Nin, Shireen Hoser, Jarrad Bingham, Adelyn Hoser, Jacky Hoser, Christopher Trojano as well as the many others who have provided logistical support to Snakebusters over many years, of which there are far too many to list here.

The Snakebusters people have also had to operate in the face of illegal attacks from individuals working at the dysfunctional animal-hating government-owned business "Zoos Victoria". "Zoos Victoria" markets itself as a "not for profit" conservation organisation, but in practice is far from this. In reality this business is a dysfunctional bureaucratic monster that hoards animals in squalid conditions and inflicts unspeakable acts of cruelty on their stock for the purpose of cheap public entertainment and regular misinformation.

Through their private army, the corrupt government law enforcement arm, the Department of Environment and Primary Industries (DEPI), they regularly effectively steal animals from private individuals (in the guise of law enforcement) to add to their own collection, a large part of which consists of animals at

varying states of decline or culpable neglect as demonstrated in Hoser (1989) and see also Hoser (1993).

Recently the "Zoos Victoria" business effectively paid to have a species of snake named in their "honour", in an act that makes a mockery of the Zoological Code and is a direct breach of the ethics of the rules of the Zoological Code (Ride *et al.* 1999).

The code states:

"Recommendation 25C. Responsibility of authors forming new names. Authors should exercise reasonable care and consideration in forming new names to ensure that they are chosen with their subsequent users in mind and that, as far as possible, they are appropriate, compact, euphonious, memorable, and do not cause offence."

Noting that "Zoos Victoria" and their associated business entities, including "Forests Victoria" and the "Department of Environment and Primary Industries" (DEPI) has caused untold damage to the wildlife conservation effort, caused wildlife extinctions and mass killings of people in bushfire disasters they have themselves created, it is self evident that the naming of a species "*Lycodon zoosvictoriae*" could only cause very serious offence to conservationists across Australia and elsewhere. The nefarious issue of people and their businesses paying cash to have species named in their honour was dealt with in detail by Hoser (2000) and quite properly condemned.

However at the present time (2014) the ICZN website says they have no policy on the matter.

Noting that the dysfunctional "Zoos Victoria" business has spent much of the past 30 years trying to destroy the important conservation work of the Snakebusters education business and similar conservation-minded people, it is fitting that at least the species originally named "*Lycodon zoosvictoriae*" in 2014 is now properly placed in a genus first named by the wildlife conservationist they sought to destroy illegally by (illegal) "legal actions" in the period 2006-2014, namely *Dannyelfakharikukri* Hoser, 2012, and in turn placed within the tribe Snakebustersusini tribe nov..

Content: *Snakebustersus muelleri* (Duméril, Bibron and Duméril, 1854) (type species); *S. alcalai* (Ota and Ross, 1994); *S. bibonius* (Ota and Ross, 1994); *S. chrysoprateros* (Ota and Ross, 1994); *S. dumérilii* (Boulenger, 1893); *S. fausti* (Gaulke, 2002); *S. ferroni* (Lanza, 1999); *S. solivagus* (Ota and Ross, 1994).

SUBGENUS MINDANAOSNAKEBUSTERSUS SUBGEN. NOV.

Type species: *Stegonotus Dumérilii* Boulenger, 1893.

Diagnosis: The snakes of the subgenus *Mindanaosnakebustersus subgen. nov.* are separated from the others within the same genus, those being in the nominate subgenus *Snakebustersus subgen. nov.*, by the following unique suite of characters: Dorsal light cross-bands evident on at least the anterior part of body; ventral surface of body with dark dots and/or spots or with dark transverse bands; lower preocular fused with loreal, or if not, smaller than upper preocular; dorsal light cross-bands evident throughout body and tail; Less than 20 light cross-bands on body, less than 15 on tail; tail length usually less than 38% (33.4-38.9%) of the snout-vent length.

Species within this subgenus and all other *Lycodon sensu lato* (tribe Snakebustersusini tribe nov.) are also defined as follows: Maxillary bent inwards anteriorly in the adult, the three to six anterior teeth increasing in size, fang-like, and separated by a toothless interspace from the rest, seven to fifteen in number, which increase in size posteriorly; anterior mandibular teeth longest, fang-like. Head not or but slightly distinct from neck, more or less depressed; eye small or moderate in a rounded orbit, with vertically elliptic pupil; nostril large or rather large. Body more or less elongate, cylindrical or slightly compressed; scales smooth or keeled, in 15, 17, 19 or 21 mid-body rows, with apical pits; ventrals with or without a lateral keel. Tail moderate to long; subcaudals and anal plate may be single or divided.

Most species have a distinct or indistinct white or pale brown nuchal collar followed posteriorly by a black to blackish-brown ground color with various white, cream or yellow bands, blotches and speckles (some without pale coloration) on body and tail.

Distribution: Mindanao, Dinagat, Leyte, Basilan, Samar, Surigao, Daraga and Luzon Islands in the Philippines.

Etymology: The name is taken from the best-known location the species occur and the original genus.

Content: *Snakebustersus* (*Mindanaosnakebustersus*) *dumérilii* (Boulenger, 1893) (type species); *S.* (*Mindanaosnakebustersus*) *ferroni* (Lanza, 1999).

SUBGENUS SNAKEBUSTERSUS SUBGEN. NOV.

Type species: *Lycodon muelleri* Duméril, Bibron and Duméril, 1854.

Diagnosis: The snakes of the subgenus *Snakebustersus subgen. nov.* are most readily separated from the other subgenus *Mindanaosnakebustersus subgen. nov.* by the absence of the following unique suite of characters: Dorsal light cross-bands evident on at least the anterior part of body; ventral surface of body with dark dots and/or spots or with dark transverse bands; lower preocular fused with loreal, or if not, smaller than upper preocular; dorsal light cross-bands evident throughout body and tail; Less than 20 light cross-bands on body, less than 15 on tail; tail length usually less than 38% (33.4-38.9%) of the snout-vent length.

Combinations not including the above suite would place the species within the subgenus *Snakebustersus subgen. nov.*

Species within this subgenus and all other *Lycodon sensu lato* (tribe Snakebustersusini *tribe nov.*) are also defined as follows:

Maxillary bent inwards anteriorly in the adult, the three to six anterior teeth increasing in size, fang-like, and separated by a toothless interspace from the rest, seven to fifteen in number, which increase in size posteriorly; anterior mandibular teeth longest, fang-like. Head not or but slightly distinct from neck, more or less depressed; eye small or moderate in a rounded orbit, with vertically elliptic pupil; nostril large or rather large. Body more or less elongate, cylindrical or slightly compressed; scales smooth or keeled, in 15, 17, 19 or 21 mid-body rows, with apical pits; ventrals with or without a lateral keel. Tail moderate to long; subcaudals and anal plate may be single or divided.

Most species have a distinct or indistinct white or pale brown nuchal collar followed posteriorly by a black to blackish-brown ground color with various white, cream or yellow bands, blotches and speckles (some without pale coloration) on body and tail.

Distribution: The Philippines.

Etymology: As for the genus.

Content: *Snakebustersus* (*Snakebustersus*) *muelleri* (Duméril, Bibron and Duméril, 1854) (type species); *S.* (*Snakebustersus*) *alcalai* (Ota and Ross, 1994); *S.* (*Snakebustersus*) *bibonius* (Ota and Ross, 1994); *S.* (*Snakebustersus*) *chrysoprateros* (Ota and Ross, 1994); *S.* (*Snakebustersus*) *fausti* (Gaulke, 2002); *S.* (*Snakebustersus*) *solivagus* (Ota and Ross, 1994).

GENUS TETRAGONOSOMA GÜNTHER, 1858.

Type species: *Lycodon effraenis* Cantor, 1847.

Diagnosis: The genus *Tetragonosoma* Günther, 1858 is separated from all other *Lycodon sensu lato* (tribe Snakebustersusini *tribe nov.*) by the following unique suite of characters:

17 mid-body scale rows; all the dorsals are smooth or with more or less developed keels only in the posterior part of the body; less than 100 subcaudals; no loreal; praefrontal in contact with the labials; three labials enter the eye; 215-228 ventrals.

Treated herein as monotypic, the species *Tetragonosoma effraenis* Cantor, 1847, is clearly composite (Siler *et al.* 2013). Those authors provide Museum voucher specimen details of both the nominate species and an undescribed form. The previously named Borneo species "*Lycodon ophitoides* Bleeker,

1859" long synonymised with "*Tetragonosoma effraenis* Cantor, 1847" since the publication of Boulenger (1893), may in fact be a separate species-level taxon.

Species within this genus and all other *Lycodon sensu lato* (tribe Snakebustersusini *tribe nov.*) are also defined as follows:

Maxillary bent inwards anteriorly in the adult, the three to six anterior teeth increasing in size, fang-like, and separated by a toothless interspace from the rest, seven to fifteen in number, which increase in size posteriorly; anterior mandibular teeth longest, fang-like. Head not or but slightly distinct from neck, more or less depressed; eye small or moderate in a rounded orbit, with vertically elliptic pupil; nostril large or rather large. Body more or less elongate, cylindrical or slightly compressed; scales smooth or keeled, in 15, 17, 19 or 21 mid-body rows, with apical pits; ventrals with or without a lateral keel. Tail moderate to long; subcaudals and anal plate may be single or divided.

Most species have a distinct or indistinct white or pale brown nuchal collar followed posteriorly by a black to blackish-brown ground color with various white, cream or yellow bands, blotches and speckles (some without pale coloration) on body and tail.

Distribution: South-east Asia, including Malaysia, Indonesia and Thailand.

Content: *Tetragonosoma effraenis* (Cantor, 1847) (monotypic).

GENUS DRYOCALAMUS GÜNTHER, 1858.

Type species: *Dryocalamus tristrigatus* Günther, 1858.

Diagnosis: The genus *Dryocalamus* Günther, 1858 is separated from all other *Lycodon sensu lato* (tribe Snakebustersusini *tribe nov.*) by the following unique suite of characters:

Maxillary teeth 8 to 10, rather short but stout, increasing in size posteriorly; anterior mandibular teeth a little longer than the posterior; one or two more or less distinct tooth-like knobs on the basisphenoid; head distinct from neck, much depressed; eye moderate or rather large, with vertically elliptic pupil; body slender, slightly compressed; scales smooth, in 13 or 15 rows, with apical pits; ventrals strongly keeled on each side. Tail moderate; subcaudals in two rows. No praeocular.

The genus *Hydrophobus* Günther, 1862, is essentially physically identical in most respects to the genus *Dryocalamus* but specimens are readily separated from that genus by the presence of one or two praeoculars.

Species within this genus and all other *Lycodon sensu lato* (tribe Snakebustersusini *tribe nov.*) are also defined as follows:

Maxillary bent inwards anteriorly in the adult, the three to six anterior teeth increasing in size, fang-like, and separated by a toothless interspace from the rest, seven to fifteen in number, which increase in size posteriorly; anterior mandibular teeth longest, fang-like. Head not or but slightly distinct from neck, more or less depressed; eye small or moderate in a rounded orbit, with vertically elliptic pupil; nostril large or rather large. Body more or less elongate, cylindrical or slightly compressed; scales smooth or keeled, in 15, 17, 19 or 21 mid-body rows, with apical pits; ventrals with or without a lateral keel. Tail moderate to long; subcaudals and anal plate may be single or divided.

Most species have a distinct or indistinct white or pale brown nuchal collar followed posteriorly by a black to blackish-brown ground color with various white, cream or yellow bands, blotches and speckles (some without pale coloration) on body and tail.

Distribution: South-east Asia including Indo-China, Indonesia and the Philippines.

Content: *Dryocalamus tristrigatus* Günther, 1858 (type species); *D. davisoni* (Blanford, 1878); *D. philippinus* Griffin, 1909.

GENUS HYDROPHOBUS GÜNTHER, 1862.

Type species: *Coluber nympha* Daudin, 1803.

Diagnosis: The genus *Hydrophobus* Günther, 1862 is separated from all other *Lycodon sensu lato* (tribe Snakebustersusini *tribe nov.*) by the following unique suite of characters:

Maxillary teeth 8 to 10, rather short but stout, increasing in size

posteriorly; anterior mandibular teeth a little longer than the posterior; one or two more or less distinct tooth-like knobs on the basisphenoid; head distinct from neck, much depressed; eye moderate or rather large, with vertically elliptic pupil; body slender, slightly compressed; scales smooth, in 13 or 15 rows, with apical pits: ventrals strongly keeled on each side. Tail moderate; subcaudals in two rows. One or two praecoculars.

The genus *Dryocalamus* Günther, 1858, is essentially physically identical in most respects to the genus *Hydrophobus* but specimens are readily separated from that genus by the absence of a praecocular.

Species within this genus and all other *Lycodon sensu lato* (tribe Snakebustersusini *tribe nov.*) are also defined as follows:

Maxillary bent inwards anteriorly in the adult, the three to six anterior teeth increasing in size, fang-like, and separated by a toothless interspace from the rest, seven to fifteen in number, which increase in size posteriorly; anterior mandibular teeth longest, fang-like. Head not or but slightly distinct from neck, more or less depressed; eye small or moderate in a rounded orbit, with vertically elliptic pupil; nostril large or rather large. Body more or less elongate, cylindrical or slightly compressed; scales smooth or keeled, in 15, 17, 19 or 21 mid-body rows, with apical pits; ventrals with or without a lateral keel. Tail moderate to long; subcaudals and anal plate may be single or divided.

Most species have a distinct or indistinct white or pale brown nuchal collar followed posteriorly by a black to blackish-brown ground color with various white, cream or yellow bands, blotches and speckles (some without pale coloration) on body and tail.

Distribution: Southern Asia from the Philippines, through Indo-China to India and Sri Lanka.

Content: *Hydrophobus nympha* (Daudin, 1803) (type species); *H. gracilis* (Günther, 1864); *H. subannulatus* (Duméril, Bibron and Duméril, 1854).

GENUS LEPTUROPHIS BOULENGER, 1900.

Type species: *Sphecodes albo-fuscus* Duméril, Bibron and Duméril, 1854.

Diagnosis: The genus *Lepturophis* Boulenger, 1900 is separated from all other *Lycodon sensu lato* (tribe Snakebustersusini *tribe nov.*) by the following unique suite of characters:

Scales strongly keeled; 17 mid-body scale rows; 155-208 all divided subcaudals; a praecocular, separating the eye from the praefrontal.

The genus is further diagnosed as follows:

Snout moderately depressed, not spatulate; eye moderate. Rostral broader than deep, just visible from above; internasals half as long as the praefrontals; frontal as long as broad, as long as the praefrontals or a little longer, much shorter than the parietals; loreal a little longer than deep, not entering the eye; one prae and two postoculars; temporals 2+2; eight upper labials, third, fourth, and fifth entering the eye; five lower labials in contact with the anterior chin-shields, which are a little shorter than the posterior. Body very slender. Scales in 17 rows, all strongly keeled. Ventrals 238-256, strongly angulate laterally; anal divided; subcaudals 155-208 all paired. Blackish brown above, young with yellow cross bands; yellowish beneath.

Species within this genus and all other *Lycodon sensu lato* (tribe Snakebustersusini *tribe nov.*) are also defined as follows:

Maxillary bent inwards anteriorly in the adult, the three to six anterior teeth increasing in size, fang-like, and separated by a toothless interspace from the rest, seven to fifteen in number, which increase in size posteriorly; anterior mandibular teeth longest, fang-like. Head not or but slightly distinct from neck, more or less depressed; eye small or moderate in a rounded orbit, with vertically elliptic pupil; nostril large or rather large. Body more or less elongate, cylindrical or slightly compressed; scales smooth or keeled, in 15, 17, 19 or 21 mid-body rows, with apical pits; ventrals with or without a lateral keel. Tail moderate

to long; subcaudals and anal plate may be single or divided.

Most species have a distinct or indistinct white or pale brown nuchal collar followed posteriorly by a black to blackish-brown ground color with various white, cream or yellow bands, blotches and speckles (some without pale coloration) on body and tail.

Distribution: Indo-China including Malaysia and Indonesia.

Content: *Lepturophis albofuscus* Duméril, Bibron and Duméril, 1854 (type species); *L. borneensis* Boulenger, 1900.

TRIBE SNAKEBUSTERSUSINI TRIBE NOV.

(Terminal taxon: *Lycodon muelleri* Duméril, Bibron and Duméril, 1854)

Diagnosis: The tribe Snakebustersusini *tribe nov.* is diagnosed as follows:

Maxillary bent inwards anteriorly in the adult, the one to six anterior teeth increasing in size, fang-like, and separated by a toothless interspace from the rest, seven to fifteen in number, which increase in size posteriorly; anterior mandibular teeth longest, fang-like. Head not or but slightly distinct from neck, more or less depressed; eye small or moderate in a rounded orbit, with vertically elliptic pupil; nostril large or rather large. Body more or less elongate, cylindrical or slightly compressed; scales smooth or keeled, in 15, 17, 19 or 21 mid-body rows, with apical pits; ventrals with or without a lateral keel. Tail moderate to long; subcaudals and anal plate may be single or divided.

Most species have a distinct or indistinct white or pale brown nuchal collar followed posteriorly by a black to blackish-brown ground color with various white, cream or yellow bands, blotches and speckles (some without pale coloration) on body and tail.

Within this diagnosis (now applicable for the tribe Snakebustersusini *tribe nov.*) several genera until now mainly treated as being within *Lycodon* would also be defined.

In order to separate all the relevant genera within this tribe, including *Lycodon* (by way of a process of elimination of other genera), the relevant genera are herein defined:

Apollopierson gen. nov. are readily separated from all other species of *Lycodon sensu lato* (tribe Snakebustersusini *tribe nov.*) by the following unique suite of characters: 19 dorsal mid body scale rows; all single subcaudals; no loreal; praefrontal in contact with the labials; ventrals laterally angulate; a praecocular separating the eye from the praefrontal; smooth dorsal scales.

The genus is further diagnosed by the following characters: Head strongly depressed; eye small, rostral not much broader than deep, being just visible from above; internasals much shorter than the praefrontals; the latter longer than broad; frontal as long as the internasals and praefrontals together, much shorter than the parietals; loreal large, nearly as deep as long, not entering the eye; one praecocular, not reaching the frontal; two postoculars; temporals 1+3; eight upper labials, third and fourth entering the eye; five lower labials in contact with the anterior chin-shields, which are longer than the posterior. Scales smooth, in 19 dorsal mid body scale rows, about 217 ventrals 217, angulate laterally; anal entire; subcaudals about 75, all single. Slate-colour, with whitish annuli, which are most marked on the lower surface (adapted from Boulenger, 1893).

The genus *Snakebustersus gen. nov.* are readily separated from all other *Lycodon sensu lato* (tribe Snakebustersusini *tribe nov.*) by the following suite of characters:

17 dorsal mid-body scale rows; all the dorsals are smooth or with more or less developed keels only in the posterior part of the body; subcaudals number more than 100.

The genus *Dinodon* Duméril, 1853 is diagnosed and separated from all other *Lycodon sensu lato* (tribe Snakebustersusini *tribe nov.*) by the following suite of characters:

Maxillary teeth 6+2 or 3+2 or 3, the anterior gradually increasing in size, the middle ones small, the last large, the three groups separated by distinct interspaces; anterior mandibular teeth enlarged. Head slightly distinct from neck; eye rather small, with

vertically elliptic pupil. Body more or less elongate; scales smooth or feebly keeled, with apical pits, in 17 (or 21) rows; ventrals angulate laterally. Tail moderate; subcaudals divided.

The snakes in the genus *Ophites* Wagler, 1830 are separated from all other *Lycodon sensu lato* (tribe Snakebustersusini *tribe nov.*) by the following suite of characters:

Mid-body scales in 17 rows; at least some dorsal scale rows are keeled along the whole body (keels sometimes scarcely visible or invisible on the scales which have lost their outermost layer); dorsal scales except for those forming outermost rows more or less weakly keeled, each keel without serrations; preocular absent; prefrontal entering eye; loreal entering eye; 8 upper labials; anal usually divided, but rarely entire; 192-230 ventrals (males 192-212, females 213-230; angulate laterally); 60-90 paired subcaudals (males 60-78, females 78-90); cross-bands at least in the juveniles, the adults tend to lose them.

The genus *Dannyelfakhariukri* Hoser, 2012 is separated from all other *Lycodon sensu lato* (tribe Snakebustersusini *tribe nov.*) by the following unique suite of characters:

17 mid-body scale rows; at least some dorsal scale rows are keeled along the whole body (keels sometimes scarcely visible or invisible on the scales which have lost their outermost layer); dorsal scales except for those forming outermost rows are more or less weakly keeled, each keel without serrations; preocular present, prefrontal not entering the eye.

The genus *Tetragonosoma* Günther, 1858 is separated from all other *Lycodon sensu lato* (tribe Snakebustersusini *tribe nov.*) by the following unique suite of characters:

17 mid-body scale rows; all the dorsals are smooth or with more or less developed keels only in the posterior part of the body; less than 100 subcaudals; no loreal; praefrontal in contact with the labials; three labials enter the eye; 215-228 ventrals.

The genus *Dryocalamus* Günther, 1858 is separated from all other *Lycodon sensu lato* (tribe Snakebustersusini *tribe nov.*) by the following unique suite of characters:

Maxillary teeth 8 to 10, rather short but stout, increasing in size posteriorly; anterior mandibular teeth a little longer than the posterior; one or two more or less distinct tooth-like knobs on the basisphenoid; head distinct from neck, much depressed; eye moderate or rather large, with vertically elliptic pupil; body slender, slightly compressed; scales smooth, in 13 or 15 rows, with apical pits; ventrals strongly keeled on each side. tail moderate; subcaudals in two rows. No praecocular.

The genus *Hydrophobus* Günther, 1862, is essentially physically identical in most respects to the genus *Dryocalamus* but specimens are readily separated from that genus by the presence of one or two praecoculars.

The genus *Lepturophis* Boulenger, 1900 is separated from all other *Lycodon sensu lato* (tribe Snakebustersusini *tribe nov.*) by the following unique suite of characters:

Scales strongly keeled; 17 mid-body scale rows; 155-208 all divided subcaudals; a praecocular, separating the eye from the praefrontal.

The genus is further diagnosed as follows:

Snout moderately depressed, not spatulate; eye moderate. Rostral broader than deep, just visible from above; internasals half as long as the praefrontals; frontal as long as broad, as long as the praefrontals or a little longer, much shorter than the parietals; loreal a little longer than deep, not entering the eye; one prae and two postoculars; temporals 2 + 2; eight upper labials, third, fourth, and fifth entering the eye; five lower labials in contact with the anterior chin-shields, which are a little shorter than the posterior. Body very slender. Scales in 17 rows, all strongly keeled. Ventrals 238-256, strongly angulate laterally; anal divided; subcaudals 155-208 all paired. Blackish brown above, young with yellow cross bands; yellowish beneath.

Distribution: Southern Asia including the regions between India, China, Japan, Indochina and Indonesia. Introduced by humans to other places.

Etymology: See for the genus *Snakebustersus gen. nov.*

Content: *Snakebustersus gen. nov.* (type genus); *Apollopierson gen. nov.*; *Dannyelfakhariukri* Hoser, 2012; *Dinodon* Duméril, 1853; *Dryocalamus* Günther, 1858; *Hydrophobus* Günther, 1862; *Lepturophis* Boulenger, 1900; *Lycodon* Boie, 1826; *Ophites* Wagler, 1830; *Tetragonosoma* Günther, 1858.

CURRENTLY RECOGNIZED SPECIES WITHIN SNAKEBUSTERSUSINI TRIBE NOV.

Snakebustersus gen. nov.

Snakebustersus (Snakebustersus) muelleri (Duméril, Bibron and Duméril, 1854) (type species);

S. (Snakebustersus) alcalai (Ota and Ross, 1994);

S. (Snakebustersus) bibonius (Ota and Ross, 1994);

S. (Snakebustersus) chrysoprateros (Ota and Ross, 1994);

S. (Snakebustersus) fausti (Gaulke, 2002);

S. (Snakebustersus) solivagus (Ota and Ross, 1994);

S. (Mindanaosnakebusterses) dumérilii (Boulenger, 1893);

S. (Mindanaosnakebusterses) ferroni (Lanza, 1999).

Apollopierson gen. nov.

Apollopierson stormi Boettger, 1892 (monotypic).

Dannyelfakhariukri Hoser, 2012.

Dannyelfakhariukri (Dannyelfakhariukri) multizonatum (Zhao and Jiang, 1981) (type species);

D. (Dannyelfakhariukri) liuchengchaoi (Zhang, Jiang, Vogel and Rao, 2011);

D. (Myanmarelfakhari) fasciatus (Anderson, 1879) (type for subgenus);

D. (Myanmarelfakhari) butleri (Boulenger, 1900);

D. (Myanmarelfakhari) cavernicolus Grismer, Quah, Muin, Wood and Aziza, 2014;

D. (Myanmarelfakhari) gammiei (Blanford, 1878);

D. (Myanmarelfakhari) gongshan Vogel and Luo, 2011;

D. (Myanmarelfakhari) synaptor (Vogel and David, 2010);

D. (Myanmarelfakhari) zoosvictoriae (Neang, Hartmann, Hun, Souter and Furey, 2014);

D. (Sinoelfakhari) ruhstrati (Fischer, 1886) (type for subgenus);

D. (Sinoelfakhari) davidi (David, Vogel, Nguyen, Kingsda and Ziegler, 2012);

D. (Sinoelfakhari) multifasciatus (Maki, 1931);

D. (Sinoelfakhari) ophiophagus (Vogel, David, Pauwels, Sumontha, Norval, Hendrix, Vu and Ziegler, 2009);

D. (Sinoelfakhari) paucifasciatus (Rendahl, 1943).

Dinodon Duméril, 1853.

Dinodon rufozonatus (Cantor, 1842) (type species);

D. flavozonatum Pope, 1928;

D. formosana (Boettger, 1885);

D. futsingensis Pope, 1928;

D. meridionale (Bourett, 1935);

D. orientalis (Hilgendorf, 1880);

D. semicarinatus (Cope, 1860);

D. septentrionalis (Günther, 1875).

Dryocalamus Günther, 1858.

Dryocalamus tristrigatus Günther, 1858 (type species);

D. davisoni (Blanford, 1878); *D. philippinus* Griffin, 1909.

Hydrophobus Günther, 1862.

Hydrophobus nympha (Daudin, 1803) (type species);

H. gracilis (Günther, 1864);

H. subannulatus (Duméril, Bibron and Duméril, 1854).

Lepturophis Boulenger, 1900.

Lepturophis albofuscus Duméril, Bibron and Duméril, 1854 (type species);

L. borneensis Boulenger, 1900.

Lycodon Boie, 1826.

- Lycodon (Lycodon) aulicus* (Linnaeus, 1758) (type species);
L. (Lycodon) capucinus (Boie, 1827);
L. (Lycodon) flavicollis Mukerjee and Bhupathy, 2007;
L. (Lycodon) flavomaculatus Wall, 1907;
L. (Lycodon) hypsirhinoides (Theobald, 1868);
L. (Lycodon) jara (Shaw, 1802);
L. (Lycodon) mackinnoni Wall, 1906;
L. (Lycodon) osmanhilli Taylor, 1950;
L. (Lycodon) striatus (Shaw, 1802);
L. (Lycodon) tessellatus Jan, 1863;
L. (Lycodon) travancoricus (Beddome, 1870);
L. (Lycodon) tiwarii Biswas and Sanyal, 1965;
L. (Lycodon) zawi Slowinski, Pawar, Win, Thin, Gyi, Oo and Tun, 2001.
L. (Cercaspis) carinatus (Kuhl, 1820) (type for subgenus);
L. (Kotabilycodon) kundui Smith, 1943 (type for subgenus);
L. (Paralycodon) laoensis Günther, 1864 (type for subgenus).

Ophites Wagler, 1830.

- Ophites subcinctus* (Boie, 1827) (type species);
O. cardamomensis (Daltry and Wüster, 2002).

Tetragonosoma Günther, 1858.

- Tetragonosoma effraenis* (Cantor, 1847) (monotypic).

CONFLICT OF INTEREST

This author reports no conflict of interest in terms of any material within this paper.

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***Korniliostyphlops* a new genus of Blindsnake from the island of Socotra.**

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ABSTRACT

Hoser (2012) published a review of the world's extant Scolecophidians naming numerous new tribes, genera and subgenera.

The new taxonomy was based on a scientific review of all species in light of recent molecular studies and older morphological studies involving the majority of known species.

Notwithstanding the usual howls of protest from a group known as the truth haters (e.g. Kaiser *et al.* 2013), who advised others to ignore the taxonomy proposed by Hoser (2012), other authors have in fact upheld the Hoser taxonomy, including Hedges *et al.* (2014), Rangasamy *et al.* (2014), Wellington (2014) and others.

In a review of the Palearctic and Socotran species Kornilios *et al.* (2013) found significant divergence between members of the genus *Lenhosertyphlops* Hoser, 2012, which by their estimate was nearly 30 million years ago.

As a result of this significant division and obvious morphological differences, the species

Lenhosertyphlops socotranus (Boulenger, 1889) is herein placed in a new monotypic genus *Korniliostyphlops* *gen. nov.*, formally defined and named herein according to the Zoological Code (Ride *et al.* 1999).

The genera *Trioanotyphlops* Hoser, 2012 and *Cottontyphlops* Hoser, 2012 were also confirmed as distinct (with a 19.6 MYA divergence) by the molecular data of Kornilios *et al.* (2013).

Keywords: Taxonomy; Blindsnakes; *Lenhosertyphlops*; *Xerotyphlops*; *socotranus*; new genus; *Korniliostyphlops*.

INTRODUCTION

Hoser (2012) published a review of the world's extant Scolecophidians naming numerous new tribes, genera and subgenera.

The new taxonomy was based on a thorough scientific review of all species in light of recent molecular studies and older morphological studies involving the majority of known species.

Notwithstanding the usual howls of protest from a group known as the truth haters (e.g. Kaiser *et al.* 2013), who advised others to ignore the code-compliant taxonomy proposed by Hoser (2012) on the basis of robust scientific evidence, other authors have in fact upheld the Hoser taxonomy, including Hedges *et al.* (2014), Rangasamy *et al.* (2014) and Wellington (2014).

Wellington (2014), Cogger (2014a, 2014b) and many others advised strongly against the Kaiser *et al.* (2013) plan to steal the works of Hoser and rename taxa in breach of the Zoological Code.

When upholding the validity of the new Blindsnake taxonomy of Hoser (2012), Hedges *et al.* (2014) engaged in extreme taxonomic vandalism to rename several Blindsnake genera named by Hoser (2012) two years earlier.

Scott Eipper (Eipper 2013) said of this plan: "You cannot use a viewpoint (Kaiser *et al.* 2013) - to act as a veto - to disregard the use of the code."

Dubois (2014) also spoke out against the actions of Kaiser *et al.* (2013) and Hedges *et al.* (2014).

On that basis, other authors have continued to use the correct Hoser (2012) nomenclature (e.g. Rangasamy *et al.* 2014) for the Blindsnakes in preference to the non-code compliant names coined by Hedges *et al.* (2014) for the same genera. Hedges *et al.* (2014) had invoked what has become known as "the Kaiser veto" in breach of the Rules of the Zoological Code and also international Intellectual Property (IP) Law.

In terms of the rules of the Zoological Code and its application, a co-signatory of Kaiser *et al.* (2013), Scott Thomson did in fact give an accurate appraisal of the position in a post on Kingsnake.com in 2003, where he said:

"Nomenclature is pretty black and white. There are a set of rules. Apply them, if the name is valid, use it, if not reject it. If you don't like it.... well I don't recall that being in the rules. Cheers, Scott Carettochelys.com"

In a review of the Palearctic and Socotran species Kornilios *et al.* (2013) found significant divergence between members of the genus *Lenhosertyphlops* Hoser, 2012, which by their estimate was nearly 30 million years ago.

This divergence was anticipated by Hoser (2012), when naming the (then) monotypic tribe *Lenhosertyphlopini* Hoser, 2012.

As a result of this significant division and obvious morphological differences, the species *Lenhosertyphlops socotranus* (Boulenger, 1889) is herein placed in a new genus, formally defined and named herein according to the Zoological Code (Ride *et al.* 1999).

Literature relevant to the taxonomy proposed herein as relevant to the species originally described as *Typhlops socotranus* Boulenger, 1889, more recently known as *Lenhosertyphlops socotranus* (Boulenger, 1889) includes the following: Boulenger (1889, 1893), Corkill and Cochrane (1966), Dubois (2014), Eipper (2013), Hedges *et al.* (2014), Hoser (2012), Kornilios *et al.* (2013), McDiarmid *et al.* (1999), Razzetti *et al.* (2011), Ride *et al.* (1999), Rösler and Wranik (2004), Steindachner (1903), Wellington (2014) and sources cited therein.

Of course I should make it clear that the name *Xerotyphlops* Hedges *et al.* 2014 is a junior synonym for *Lenhosertyphlops* Hoser, 2012 and therefore should not be used under any circumstance. *Xerotyphlops* has the same type species as the earlier (and proper) name *Lenhosertyphlops*.

That species is *Lenhosertyphlops vermicularis* (Merrem, 1820). The genus *Trioanotyphlops* Hoser, 2012, included two Middle-eastern species and two from Africa.

I also note herein that Kornilios *et al.* (2013), found that they diverged from *Cottontyphlops* Hoser, 2012 about 19.6 MYA, confirming the Hoser (2012) view that these species should be grouped in separate genera, as named in that paper, noting that Hoser (2012) relied on morphological and geological evidence to separate the genera and not with any available molecular data.

However the molecular results as published by Kornilios *et al.* (2013), confirmed what had been ascertained by the perfectly valid alternative scientific methods.

KORNILIOSTYPHLOPS GEN. NOV.

Type species: *Typhlops socotranus* Boulenger, 1889.

More recently known as *Lenhosertyphlops socotranus* (Boulenger, 1889).

Diagnosis: *Korniliostyphlops gen. nov.* is a genus monotypic for the species *K. socotranus* (Boulenger, 1889).

Korniliostyphlops gen. nov. are separated from the morphologically similar *Lenhosertyphlops* Hoser, 2012 by the following suite of characters: 24 scales round the body (versus 22 or 24 in *Lenhosertyphlops*); preocular broader than the ocular (versus as broad as the ocular in *Lenhosertyphlops*); snout rounded, very prominent; nostrils lateral (versus snout depressed, rounded, strongly projecting; nostrils lateral in *Lenhosertyphlops*); preocular present, being broader than the nasal or the ocular (versus being as broad as the ocular in *Lenhosertyphlops*); colour is whitish, with pale brown lines running between the dorsal series of scales, (versus brown or brownish above, yellowish inferiorly in *Lenhosertyphlops*).

Lenhosertyphlops Hoser, 2012 and *Korniliostyphlops gen. nov.* are separated from all other Blind Snakes by the following suite of characters: Snout is depressed and/or rounded, strongly projecting; nostrils are lateral. The rostral is about one-third of the width of the head, extending nearly to the level of the eyes; nasal is incompletely divided, the cleft proceeding from the second labial; preocular is present, about as broad as the ocular or slightly broader, in contact with the second and third labials; eyes are distinguishable; upper head scales are moderately enlarged; four upper labials.

Diameter of the body is 40-52 times in the total length. The tail is about as long as broad and ends in a spine. There are 22-24 mid body rows. Colour is brownish above and lighter (usually yellowish) ventrally.

Within the genus *Lenhosertyphlops* Hoser, 2012 are the species *Lenhosertyphlops vermicularis* (Merrem, 1820) (type species) and the similar *Lenhosertyphlops etheridgei* (Wallach, 2002),

Both *Lenhosertyphlops* (type genus) and *Korniliostyphlops* consist the entire contents of the tribe Lenhosertyphlopini Hoser, 2012.

Distribution: Endemic to Socotra Island (controlled by Yemen).

Etymology: The genus is named in honour of Panagiotti Kornilios of Greece in recognition of his work on Blindsnakes within the tribe Lenhosertyphlopini Hoser, 2012.

Content: *Korniliostyphlops socotranus* (Boulenger, 1889) (monotypic).

CONFLICT OF INTEREST

This author reports no conflict of interest in terms of any material within this paper.

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A long overdue taxonomic rearrangement of the Uromastycinae (Squamata: Sauria: Agamidae).

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ABSTRACT

For most of the past 2 centuries the entire Leiolepidinae Fitzinger, 1843. has been treated as consisting of just two genera.

These are: *Leiolepis* Cuvier, 1829 and *Uromastyx* Merrem, 1820.

Based on the molecular results of Pyron *et al.* (2013) and others, Uromastycinae Theobold, 1868 is herein recognized as a subfamily being separate from Leiolepidinae, now treated as only including the genus *Leiolepis*. Ultimately both groups may warrant full family-level recognition.

Recently, Wilms *et al.* (2009) commenced the long-awaited dissection of *Uromastyx* with the resurrection of *Saara* Gray, 1845 to accommodate the three most divergent species (as a clade) within the genus *Uromastyx* as popularly recognized.

Noting that many authors have recognized distinctive species groups and/or clades as a result of detailed studies, this paper formalizes these results by revising the taxonomy of the extant members of the subfamily Uromastycinae.

As a result, the genus *Saara* is divided into three genera, with *Centrotrachelus* Strauch, 1863 resurrected. *Centrotrachelus* is divided into two genera, the other formally named *Borgsaurus gen. nov.*

Uromastyx is divided into four genera, utilizing the existing names *Uromastyx* Merrem, 1820 and *Aporoscelis* Boulenger, 1885 for two species groups, with two new genera formally named for the first time, these being *Euanedwardssaurus gen. nov.* and *Dicksmithsaurus gen. nov.*

Euanedwardssaurus gen. nov. is divided three ways, the other subgenera being *Newmansaurus subgen. nov.* and *Dallysaurus subgen. nov.*. *Dicksmithsaurus gen. nov.* is also divided three ways, the other subgenera being *Stokessaurus subgen. nov.* and *Mooresaurus subgen. nov.*

Uromastyx is split two ways, with the monotypic subgenus *Supremeuromastyx subgen. nov.* erected to accommodate the most divergent taxon.

Noting that *Saara*, *Centrotrachelus* and *Borgsaurus gen. nov.* diverged from the other genera and species in the Uromastycinae between 25 and 29 MYA, they are herein placed in the tribe Borgsauriini *tribe nov.*

Uromastyx, *Aporoscelis*, *Euanedwardssaurus gen. nov.* and *Dicksmithsaurus gen. nov.* are placed in a the tribe Uromastyxiini *tribe nov.*

Noting that the various subgenera defined herein are believed to have diverged from one another at between 6 and 15 MYA based on a calibration of the molecular results with relevant geological and climatic events using various mathematic formulae, it is likely that some or all may eventually be recognized as full genera.

Keywords: Taxonomy; Lizards; Middle-east; Asia; Africa; Uromastycinae; Leiolepidinae; *Leiolepis*; *Uromastyx*; *Saara*; *Centrotrachelus*; new tribes; Borgsauriini; Uromastyxiini; new genera; *Borgsaurus*; *Euanedwardssaurus*; *Dicksmithsaurus*; new subgenera; *Supremeuromastyx*; *Newmansaurus*; *Dallysaurus*; *Stokessaurus*; *Mooresaurus*.

INTRODUCTION

For most of the past two hundred years the entire Leiolepidinae Fitzinger, 1843. has been treated by most publishing herpetologists as consisting of just two genera.

These are: *Leiolepis* Cuvier, 1829 and *Uromastyx* Merrem, 1820.

Based on the molecular results of Pyron *et al.* (2013) and others,

Uromastycinae Theobold, 1868 is herein recognized as a subfamily being separate from Leiolepidinae, now treated as only including the genus *Leiolepis*. Ultimately both groups may warrant full family-level recognition.

Some authors have already taken that step.

Recently, Wilms *et al.* (2009) commenced the long-awaited

dissection of *Uromastix* with the resurrection of *Saara* Gray, 1845 to accommodate the three most divergent species (as a clade) within the genus *Uromastix* as popularly recognized.

Noting that many authors have recognized distinctive species groups and/or clades as a result of detailed studies, this paper formalizes these results by revising the taxonomy of the extant members of the subfamily Uromastycinae.

The genus *Saara* (currently 3 recognized species) is divided into three genera, with *Centrotrachelus* Strauch, 1863 resurrected.

Centrotrachelus is divided into two genera, the other formally named *Borgsaurus gen. nov.*

Uromastix (currently about 20 recognized species) is divided into four genera, utilizing the existing names *Uromastix* Merrem, 1820 and *Aporoscelis* Boulenger, 1885 for two species groups.

Two new genera are formally named for the first time, these being *Euanedwardssaurus gen. nov.* and *Dicksmithsaurus gen. nov.*

Euanedwardssaurus gen. nov. is divided three ways, the other subgenera being *Newmansaurus subgen. nov.* and *Dallysaurus subgen. nov.*. *Dicksmithsaurus gen. nov.* is also divided three ways, the other subgenera being *Newmansaurus subgen. nov.* and *Dallysaurus subgen. nov.*

Uromastix is split two ways, with the monotypic subgenus *Supremeuromastix subgen. nov.* erected to accommodate the most divergent taxon.

Noting that *Saara*, *Centrotrachelus* and *Borgsaurus gen. nov.* diverged from the other genera and species in the Uromastycinae between 25 and 29 MYA, they are herein placed in the tribe *Borgsauriini tribe nov.*

Uromastix, *Aporoscelis*, *Euanedwardssaurus gen. nov.* and *Dicksmithsaurus gen. nov.* are placed in a the tribe *Uromastixiini tribe nov.*

These relatively large and iconic lizards have been subjected to numerous detailed studies over the past two centuries, including recently molecular studies that have resolved relationships between species within the relevant genera.

The material and methods used as the basis for this science-based reclassification has been inspection of live specimens at various facilities since 1993 as well as a thorough review of the scientific and other (relevant) literature.

Significant studies relevant to the taxonomy of the Uromastycinae include the following: Amer and Kumazawa (2005), Anderson (1894, 1896, 1901), Anderson (1999), Anajeva (2004), Arnold (1980, 1986, 1987), Baha El Din (1996), Bell (1825), Blanford (1874, 1881), Böhme (1978, 1982, 1988), Boulenger (1885), Cunningham (2000, 2001a, 2001b), Darevsky and Kupriyanova (1993), Denzer *et al.* (1997), Fitzinger (1826, 1843), Forsskal (1775), Frahm (2006), Fris and Thulin (1984), Geniez *et al.* (2004), Gray (1845), Haas and Werner (1969), Hall (1999), Handl (2002), Hardwicke and Gray (1827), Harris *et al.* (2007), Heyden (1827), Honda *et al.* (2000), Joger (1986, 1987), Joger and Gray (1997), Joger and Lambert (1996), Kevork and Al-Uthman (1972), Khalaf (1959), Khan (1980), Knapp (2004), Kocher *et al.* (1989), Lanza (1988), Largen and Spawls (2006), Leviton *et al.* (1992), Lichtenstein (1823), Löhr (2004), Macey *et al.* (1997, 2000), Maddison *et al.* (1984), Mateo *et al.* (1998), Merrem (1820), Mertens (1956, 1962), Minton (1966), Moody (1980, 1987), Müller (1921, 1951), Murray (1884), Ninni (1933), Nylander (2002), O'Shaughnessy (1880), Page (2001), Palumbi *et al.* (1991), Parker (1930, 1932, 1942), Peters (1971), Rastegar-Pouyani (2005), Pyron *et al.* (2013), Reeder (2003), Saleh (1997), Schätti (1989), Schätti and Desvoignes (1999), Schätti and Gasperetti (1994), Schleich *et al.* (1996), Schmitz (2003), Schmitz *et al.* (2001, 2005), Seuffer *et al.* (1998), Sindalco and Jeremcenco (2008), Straunch (1863), Steindachner (1899), Swofford (2002), Tourenq (2005), Watrous and Wheeler (1981), Vernet *et al.* (1998), Wermuth (1967), Wilms (1995, 1998, 2001, 2005, 2007a, 2007b), Wilms and Böhme (2000a, 2000b, 2000c, 2001, 2007), Wilms and Hulbert (1995, 2000), Wilms and Müller (1998), Wilms and Schmitz (2007), Wilms *et al.* (2002a, 2002b, 2003, 2009), Yang *et al.* (1994), Zari (1999) and sources cited therein.

Because of the detail of descriptions within the just cited material,

and the fact that the major recent works by Wilms and others are widely available on the internet, most of this information is not unnecessarily repeated here. This paper instead concentrates on providing proper Zoological Code compliant descriptions of the relevant species groups.

While this paper does not specifically deal with the Leiolepidinae, I should make mention of some key studies into this group including a number that attempted to deal with or resolve taxonomic matters, these including Ananjeva *et al.* (2001), Aranyavalai *et al.* (2004), Bobrov and Semenov (2008), Böhme (2013, 2012), Boistel *et al.* (2011), Boulenger (1885, 1890), Chan-ard *et al.* (1999), Cox *et al.* (1998), Darevsky and Kupriyanov (1993), de Rooij (1915), Gray (1835), Grismer (2008, 2011), Grismer and Grismer (2010), Grismer *et al.* (2002, 2007), Hall (2009), Hardwicke and Gray (1827), Hartmann *et al.* (2012), Hien *et al.* (2001), Lim and Ng (1999), Macey *et al.* (2000), Manthey and Grossmann (1997), Manthey and Schuster (1999), Mertens (1951), Meshaka (2011), Pauwels and Chimsunchart (2007), Pauwels *et al.* (2000, 2003), Sang *et al.* (2009), Smith (1935), Sworder (1933), Taylor (1963), Ziegler and Nguyen (2010) and sources cited therein.

NOTES ON TAXA NAMED HEREIN

The format of the descriptions is as follows: It commences with a new diagnosis for the subfamily Uromastycinae, followed by one for each genus, including those already formally described and for which their names were already available for use by others within the rules of the Zoological Code (Ride *et al.* 1999). Each new genus-level diagnosis will in effect separate each of the relevant genera from one another. After these there will be formal diagnosis and definitions according to the rules of the Zoological Code for each of the newly named tribes.

In the event a later author seeks to merge one or more taxon groups (taxa) described within this paper, the order of priority should be by page priority in terms of this paper; that is the first name listed is the first to be used. Gender, spellings and the like of names or other perceived errors should not be altered in any way unless mandated by the Zoological Code, even if apparently wrong in the original descriptions herein, including by derivation or gender.

SUBFAMILY UROMASTYCINAE THEOBOLD, 1868.

(Terminal taxon: *Lacerta aegyptia* Forskal, 1775)

Diagnosis: The lizard subfamily *Uromastycinae* Theobold, 1868 is most easily defined as follows:

Acrodont dentition, with the premaxillary bone forming in adult specimens a sharp, tooth-like structure replacing the incisive teeth. Tail scalation is arranged in distinct whorls.

For the tribe *Uromastixiini tribe nov.* these whorls are not separated by intercalary scales dorsally.

For the tribe *Borgsauriini tribe nov.* these whorls are separated by 1-6 rows of intercalary scales dorsally.

In further detail the subfamily Uromastycinae is defined as follows: Tympanum large, vertically elliptic and distinct. Incisors large, uniting in the adult into one or two cutting-teeth, separated from the molars by a toothless interspace. Body depressed, without crest. No gular pouch; a transverse gular fold. Tail short, depressed, covered with whorls of large spinose scales. Praeanal and femoral pores present.

The head is small, feebly depressed, with a short snout and obtuse canthus rostralis; nostril large, directed backwards, nearer the end of the snout than the eye; upper head-scales smooth, much larger than those on the body, smallest on supraorbital region; occipital not enlarged; labials small and numerous. Neck strongly plicate. Limbs short and thick; hind limb with spinose conical tubercles; digits short and armed with strong claws. Scales on upper surface of body very small, on belly larger, fiat, smooth, juxtaposed or subimbricate.

Distribution: Species until now placed in the genus *Uromastix* (now placed in the tribe *Uromastixiini tribe nov.*) inhabit a range stretching through most of North Africa and the Middle East, ranging as far east as Iran. The three species found further east in dry habitats in southwest Asia, ranging from Iran to north-western

India have more recently been placed in the genus *Saara* (Borgsauriini tribe nov.).

Content: *Uromastyx* Merrem, 1820 (type genus); *Aporoscelis* Boulenger, 1885; *Borgsaurus* gen. nov.; *Centrotrachelus* Strauch, 1863; *Dicksmithsaurus* gen. nov.; *Euanedwardssaurus* gen. nov.; *Saara* Gray, 1845.

GENUS UROMASTYX MERREM, 1820.

Type species: *Lacerta aegyptia* Forskal, 1775.

Diagnosis: The lizard genus *Uromastyx* Merrem, 1820 has until recently been diagnosed as follows:

Acrodont dentition, with the premaxillary bone forming in adult specimens a sharp, tooth-like structure replacing the incisive teeth. Tail scalation arranged in distinct whorls, which are not separated by intercalary scales dorsally. The fact that the whorls on the tail are not separated by intercalary scales dorsally divides *Uromastyx* and all other species in the tribe Uromastyxiini tribe nov. from the genera within the tribe Borgsauriini tribe nov..

With *Uromastyx* as recognized by other authors to date, herein divided into four genera, corresponding with well-established species group lineages, the genus is best diagnosed by defining what separates species within each of the four genera formerly treated as being within *Uromastyx*.

Each of the four genera are hereby defined as follows:

The genus *Uromastyx* is defined and separated from all other Uromastyxiini tribe nov. as follows, being one or other of: Has preanofemoral pores; tail long, approx. 48-103% of SVL, and when viewed from above it appears to be elongated (as opposed to disc-shaped); the last 2-5 tail whorls formed of continuous scales rows; 238-391 scales at midbody, 112-193 ventrals between gular and inguinal fold, (subgenus *Uromastyx*); or: Without preanofemoral pores; tail long, approx. 71-94% of SVL; 22-27 whorls on the tail; body scales small, approx. 297-301 scales around the midbody; 121-122 scales between gular and inguinal fold (subgenus *Supremeuromastyx* subgen. nov.).

The genus *Aporoscelis* Boulenger, 1885 is separated from all other Uromastyxiini tribe nov. by lacking preanofemoral pores and having a relatively short tail, being about 35-53% of the SVL and having 9-14 whorls on the tail.

Wilms *et al.* (2009) noted "With the exception of *Uromastyx thomasi*, *U. princeps* is distinguished from all other taxa in the genus (as defined by them) by its significantly shorter tail. From *U. thomasi* it is distinguished by the absence of preanofemoral pores."

The genus *Edwardssaurus* gen. nov. is best defined by separation of each of the described subgenera. Therefore each diagnosis given herein separates not just the subgenus from others within the genus, but also from all other Uromastyxiini tribe nov. species. *Edwardssaurus* gen. nov. are defined by one of the following three suites of characters:

1/ Has preanofemoral pores; the tail is long being 48-75% of SVL, from above the tail has an elongated appearance; the last 2-5 tail whorls are formed of continuous scales rows; 138-227 scales at midbody; 68-112 ventrals between gular and inguinal fold; tail with 16-21 whorls (subgenus *Edwardssaurus* subgen. nov.), or:

2/ Has preanofemoral pores; the tail is long being 48-103% of SVL, viewed from above it appears to be elongated; the last 12-21 tail whorls formed of continuous scale rows; anterior margin of ear opening without enlarged scales (subgenus *Newmansaurus* subgen. nov.), or:

3/ Lacks preanofemoral pores; the tail is long being 71-94 % of SVL; 22-27 tail whorls; body scales larger, approx. 143-227 scales at midbody; 66-100 scales between gular and inguinal fold (subgenus *Dalysaurus* subgen. nov.).

The genus *Dicksmithsaurus* gen. nov. best defined by separation of each of the described subgenera. Therefore each diagnosis given herein separates not just the subgenus from others within the genus, but also from all other Uromastyxiini tribe nov. species. *Dicksmithsaurus* gen. nov. are defined by one of the following three suites of characters:

1/ Has preanofemoral pores; the tail is long being 48-103% of SVL, and when viewed from above it appears to be elongated; the last

12-21 tail whorls formed of continuous scale rows; anterior margin of ear opening has enlarged scales (subgenus *Dicksmithsaurus* subgen. nov.), or:

2/ Has preanofemoral pores; the tail is short being 25-35% of the SVL and when viewed from above it appears to be disk-shaped (subgenus *Stokessaurus* subgen. nov.), or:

3/ Has preanofemoral pores; the tail is long being 70-98% of the SVL, and when viewed from above it appears to be an elongated shape; the last 2-5 tail whorls formed of continuous scales rows; 138-227 scales at midbody, 68-112 ventrals between gular and inguinal fold; tail with 20-24 whorls (subgenus *Mooressaurus* subgen. nov.).

Comment: It is likely that further studies will result in *Supremeuromastyx* subgen. nov. being elevated to full genus status, with the current designation being at the most conservative available.

The morphological differences between the nominate species and other *Uromastyx* are significant.

Distribution: Northern Egypt, through the Middle-east to Iran for the subgenus *Uromastyx* and known from two locations only in the Western Sahara Desert for *Supremeuromastyx* subgen. nov..

Content: *Uromastyx aegyptia* (Forskal, 1775) (type species); *U. leptieni* Wilms and Böhme, 2000; *U. microlepis* Arnold, 1980; *U. occidentalis* Mateo, Geniuz, Lopez-Jurado and Bons, 1999.

SUBGENUS UROMASTYX MERREM, 1820.

Type species: *Lacerta aegyptia* Forskal, 1775.

Diagnosis: The subgenus *Uromastyx* Merrem, 1820, is separated from the other subgenus *Supremeuromastyx* subgen. nov. by the following suite of characters: Specimens have preanofemoral pores; a long tail that is approx. 48-103% of SVL, and when viewed from above it appears to be elongated (as opposed to disc-shaped); the last 2-5 tail whorls are formed of continuous scales rows; 238-391 scales at midbody, 112-193 ventrals between gular and inguinal fold.

This is contrasted with *Supremeuromastyx* subgen. nov. which is defined as having no preanofemoral pores; a long tail, being approx. 71-94% of SVL; 22-27 whorls on the tail; body scales small, approx. 297-301 scales around the midbody; 121-122 scales between gular and inguinal fold (subgenus *Supremeuromastyx* subgen. nov.).

The two subgeneric diagnoses also separate each subgenus from all other species and genera within the tribe Uromastyxiini tribe nov..

Distribution: The three species within the subgenus *Uromastyx* Merrem, 1820 have the following distributions:

Uromastyx aegyptia (Forskal, 1775) the type species is found in northern Egypt east of the river Nile, the Sinai Peninsula, Palestina and extreme northwestern Saudi Arabia (Wadi Sawawin / Jabal as Sinfa). The border between the ranges of the taxa *U. aegyptia* and *U. microlepis* Arnold, 1980 is obviously east of Wadi Araba in Palestina and Jordan and east of Wadi Sawawin in the Jabal as Sinfa region of Saudi Arabia.

Uromastyx microlepis Arnold, 1980 is found in the deserts and semideserts of Arabia (Saudi Arabia, Yemen, Oman, United Arab Emirates, Qatar, Kuwait), in Jordan, Syria, Iraq and coastal Iran.

Uromastyx leptieni Wilms and Böhme, 2000 is known from east of the Hajar al-Gharbi mountains in northern Oman (from the vicinity of Muscat up to the Musandam peninsular), and from north-eastern United Arab Emirates. The westernmost locality is near Abu Dhabi Airport.

SUBGENUS SUPREMEUROMASTYX SUBGEN. NOV.

Type species: *Uromastyx occidentalis* Mateo, Geniuz, Lopez-Jurado and Bons, 1999.

Diagnosis: The subgenus *Supremeuromastyx* subgen. nov. is separated from *Uromastyx* Merrem, 1820, by the following suite of characters:

No preanofemoral pores; a long tail, being approx. 71-94% of SVL; 22-27 whorls on the tail; body scales small, approx. 297-301 scales around the midbody; 121-122 scales between gular and inguinal fold (subgenus *Supremeuromastyx* subgen. nov.).

This is contrasted with the diagnosis for the subgenus *Uromastyx* which are defined as follows:

Preanofemoral pores present; a long tail that is approx. 48-103% of SVL, and when viewed from above it appears to be elongated (as opposed to disc-shaped); the last 2-5 tail whorls are formed of continuous scales rows; 238-391 scales at midbody, 112-193 ventrals between gular and inguinal fold (subgenus *Uromastyx*). The two subgeneric diagnoses also separate each subgenus from all other species and genera within the tribe Uromastyxiini *tribe nov.*

Distribution: Known only from the type locality and from Udei Sfa (45 km west of Maatal Laj, 22°22'N 15°32'W; in the Western Sahara, North Africa, Genez *et al.* 2004).

Ertmology: The name *Supremeuromastyx* in two parts refers to (a) the magnificence of the species monotypic for the subgenus and (b) the obvious close affinity with the nominate subgenus *Uromastyx*.

Content: *Uromastyx (Supremeuromastyx) occidentalis* Mateo, Geniuz, Lopez-Jurado and Bons, 1999 (monotypic).

GENUS *APOROSCELIS* BOULENGER, 1885.

Type species: *Uromastix princeps* O'Shaughnessy, 1880.

Diagnosis: The genus *Aporoscelis* Boulenger, 1885 is separated from all other Uromastyxiini *tribe nov.* by lacking preanofemoral pores and having a relatively short tail, being about 35-53% of the SVL and having 9-14 whorls on the tail.

Wilms *et al.* (2009) noted "With the exception of *Uromastyx thomasi*, *U. princeps* is distinguished from all other taxa in the genus (as defined by them) by its significantly shorter tail. From *U. thomasi* it is distinguished by the absence of preanofemoral pores."

Distribution: Found in the Somalian provinces of Sanaag, Bari, Nogal and Mudug.

Content: *Aporoscelis princeps* (O'Shaughnessy, 1880) (monotypic).

GENUS *EDWARDSSAURUS* GEN. NOV.

Type species: *Uromastyx dispar* Heyden, 1827.

Diagnosis: The genus *Edwardssaurus gen. nov.* is best defined by separation of each of the described subgenera.

Therefore each diagnosis given herein separates not just the subgenus from others within the genus, but also from all other Uromastyxiini *tribe nov.* species.

Edwardssaurus gen. nov. are defined by one of the following three suites of characters:

1/ Has preanofemoral pores; the tail is long being 48-75% of SVL, from above the tail has an elongated appearance; the last 2-5 tail whorls are formed of continuous scales rows; 138-227 scales at midbody; 68-112 ventrals between gular and inguinal fold; tail with 16-21 whorls (subgenus *Edwardssaurus subgen. nov.*), or:

2/ Has preanofemoral pores; the tail is long being 48-103% of SVL, viewed from above it appears to be elongated; the last 12-21 tail whorls formed of continuous scale rows; anterior margin of ear opening without enlarged scales (subgenus *Newmansaurus subgen. nov.*), or:

3/ Lacks preanofemoral pores; the tail is long being 71-94% of SVL; 22-27 tail whorls; body scales larger, approx. 143-227 scales at midbody; 66-100 scales between gular and inguinal fold (subgenus *Dallysaurus subgen. nov.*).

The lizard subfamily *Uromastycinae* Theobald, 1868 is most easily defined as follows:

Acrodont dentition, with the premaxillary bone forming in adult specimens a sharp, tooth-like structure replacing the incisive teeth. Tail scalation is arranged in distinct whorls.

For the tribe Uromastyxiini *tribe nov.* these whorls are not separated by intercalary scales dorsally.

For the tribe Borgsauriini *tribe nov.* these whorls are separated by 1-6 rows of intercalary scales dorsally.

In further detail the subfamily Uromastycinae is defined as follows: Tympanum large, vertically elliptic and distinct. Incisors large, uniting in the adult into one or two cutting-teeth, separated from the molars by a toothless interspace. Body depressed, without crest.

No gular pouch; a transverse gular fold. Tail short, depressed, covered with whorls of large spinose scales. Praeanal and femoral pores present.

The head is small, feebly depressed, with a short snout and obtuse canthus rostralis; nostril large, directed backwards, nearer the end of the snout than the eye; upper head-scales smooth, much larger than those on the body, smallest on supraorbital region; occipital not enlarged; labials small and numerous. Neck strongly plicate. Limbs short and thick; hind limb with spinose conical tubercles; digits short and armed with strong claws. Scales on upper surface of body very small, on belly larger, fiat, smooth, juxtaposed or subimbricate.

Distribution: Northern Africa, including those countries that abut and include the Sahara Desert as well as the immediately nearby Middle East and lower Arabian Peninsula.

Etymology: Named in honour of Euan Edwards, currently of the Gold Coast, Queensland, Australia, for his immense contributions to herpetology world-wide, including considerable behind the scenes logistical support for herpetologists and scientists in several countries (including myself), including extensive fieldwork in Australia, the United States of America, Madagascar and Africa and gaining access to various institutions, collections, diagnostic facilities and the like, spanning some decades. Also of note is that it was in August 1993, when in Florida, USA that I was with Euan Edwards when he first showed me live specimens of "*Uromastyx*" from the genus now named in his honour that were on view at the 1993 Orlando Reptile Expo.

Content: *Edwardssaurus dispar* (Heyden, 1827) (type species); *E. acanthinura* (Bell, 1825); *E. benti* (Anderson, 1894); *E. flavifasciata* (Mertens, 1962); *E. hodhensis* (Trape *et al.*, 2012); *E. maliensis* (Joger and Lambert, 1996); *E. nigriventris* (Rothschild and Hartert, 1912); *E. ocellata* (Lichenstein, 1823); *E. shobraki* (Wilms and Schmitz, 2007); *E. yemenensis* (Wilms and Schmitz, 2007).

SUBGENUS *EDWARDSSAURUS* SUBGEN. NOV.

Type species: *Uromastyx dispar* Heyden, 1827.

Diagnosis: The subgenus *Edwardssaurus subgen. nov.* is defined by the following suite of characters:

Has preanofemoral pores; the tail is long being 48-75% of SVL, from above the tail has an elongated appearance; the last 2-5 tail whorls are formed of continuous scales rows; 138-227 scales at midbody; 68-112 ventrals between gular and inguinal fold; tail with 16-21 whorls (subgenus *Edwardssaurus subgen. nov.*).

The other two subgenera within *Edwardssaurus gen. nov.* are defined as follows: one or other of:

1/ Has preanofemoral pores; the tail is long being 48-103% of SVL, viewed from above it appears to be elongated; the last 12-21 tail whorls formed of continuous scale rows; anterior margin of ear opening without enlarged scales (subgenus *Newmansaurus subgen. nov.*), or:

2/ Lacks preanofemoral pores; the tail is long being 71-94% of SVL; 22-27 tail whorls; body scales larger, approx. 143-227 scales at midbody; 66-100 scales between gular and inguinal fold (subgenus *Dallysaurus subgen. nov.*).

Distribution: North Africa.

Etymology: See for genus *Edwardssaurus gen. nov.*

Content: *Edwardssaurus (Edwardssaurus) dispar* (Heyden, 1827) (type species); *E. (Edwardssaurus) acanthinura* (Bell, 1825); *E. (Edwardssaurus) flavifasciata* (Mertens, 1962); *E. (Edwardssaurus) hodhensis* (Trape *et al.*, 2012); *E. (Edwardssaurus) maliensis* (Joger and Lambert, 1996); *E. (Edwardssaurus) nigriventris* (Rothschild and Hartert, 1912).

SUBGENUS *DALLYSAURUS* SUBGEN. NOV.

Type species: *Aporoscelis benti* Anderson, 1894.

Diagnosis: The subgenus *Dallysaurus subgen. nov.* is defined by the following suite of characters:

Lacks preanofemoral pores; the tail is long being 71-94% of SVL; 22-27 tail whorls; body scales larger, approx. 143-227 scales at midbody; 66-100 scales between gular and inguinal fold (subgenus *Dallysaurus subgen. nov.*).

The other two subgenera within *Edwardssaurus gen. nov.* are

defined as follows: one or other of:

1/ Has preanofemoral pores; the tail is long being 48-75% of SVL, from above the tail has an elongated appearance; the last 2-5 tail whorls are formed of continuous scales rows; 138-227 scales at midbody; 68-112 ventrals between gular and inguinal fold; tail with 16-21 whorls (subgenus *Edwardssaurus subgen. nov.*).

2/ Has preanofemoral pores; the tail is long being 48-103% of SVL, viewed from above it appears to be elongated; the last 12-21 tail whorls formed of continuous scale rows; anterior margin of ear opening without enlarged scales (subgenus *Newmansaurus subgen. nov.*).

Distribution: The southern Arabian Peninsula.

Etiology: Named in honour of Gavin Dally, in 2014 the long-serving collection manager at the Natural Sciences Museum and Art Gallery of the Northern Territory, Darwin, NT, for his many services to zoology.

Content: *Edwardssaurus (Dallysaurus) benti* (Anderson, 1894) (type species); *E. (Dallysaurus) shobraki* (Wilms and Schmitz, 2007); *E. (Dallysaurus) yemenensis* (Wilms and Schmitz, 2007).

SUBGENUS NEWMANSAURUS SUBGEN. NOV.

Type species: *Uromastix ocellata* Lichtenstein, 1823.

Diagnosis: The subgenus *Newmansaurus subgen. nov.* is defined by the following suite of characters:

Has preanofemoral pores; the tail is long being 48-103% of SVL, viewed from above it appears to be elongated; the last 12-21 tail whorls formed of continuous scale rows; anterior margin of ear opening without enlarged scales (subgenus *Newmansaurus subgen. nov.*).

The other two subgenera within *Edwardssaurus gen. nov.* are defined as follows: one or other of:

1/ Has preanofemoral pores; the tail is long being 48-75% of SVL, from above the tail has an elongated appearance; the last 2-5 tail whorls are formed of continuous scales rows; 138-227 scales at midbody; 68-112 ventrals between gular and inguinal fold; tail with 16-21 whorls (subgenus *Edwardssaurus subgen. nov.*).

2/ Lacks preanofemoral pores; the tail is long being 71-94% of SVL; 22-27 tail whorls; body scales larger, approx. 143-227 scales at midbody; 66-100 scales between gular and inguinal fold (subgenus *Dallysaurus subgen. nov.*).

Distribution: North-east Africa, including North-west Somalia, Djibouti, Eritrea, Northern Sudan, South East Egypt, Ethiopia (near the Somalian border).

Etiology: Named in honour of Chris Newman of the United Kingdom, Chairman of the Federation of British Herpetologists in recognition of many years work, lobbying for the rights of private reptile keepers in the UK.

Content: *Edwardssaurus (Newmansaurus) ocellata* (Lichtenstein, 1823) (monotypic).

GENUS DICKSMITHSAURUS GEN. NOV.

Type species: *Uromastix macfadyeni* Parker, 1932.

Diagnosis: The genus *Dicksmithsaurus gen. nov.* is best defined by separation of each of the described subgenera, (within *Dicksmithsaurus gen. nov.*). Therefore each diagnosis given herein separates not just the subgenus from others within the genus, but also from all other *Uromastyxini tribe nov.* species.

Dicksmithsaurus gen. nov. are defined by one of the following three suites of characters:

1/ Has preanofemoral pores; the tail is long being 48-103% of SVL, and when viewed from above it appears to be elongated; the last 12-21 tail whorls formed of continuous scale rows; anterior margin of ear opening has enlarged scales (subgenus *Dicksmithsaurus subgen. nov.*), or:

2/ Has preanofemoral pores; the tail is short being 25-35% of the SVL and when viewed from above it appears to be disk-shaped (subgenus *Stokessaurus subgen. nov.*), or:

3/ Has preanofemoral pores; the tail is long being 70-98% of the SVL, and when viewed from above it appears to be an elongated shape; the last 2-5 tail whorls formed of continuous scales rows; 138-227 scales at midbody, 68-112 ventrals between gular and inguinal fold; tail with 20-24 whorls (subgenus *Mooressaurus subgen. nov.*).

The lizard genus *Uromastix* Merrem, 1820 (now divided to include other genera including *Dicksmithsaurus gen. nov.*) has until recently been diagnosed as follows:

Acrodont dentition, with the premaxillary bone forming in adult specimens a sharp, tooth-like structure replacing the incisive teeth. Tail scalation arranged in distinct whorls, which are not separated by intercalary scales dorsally. The fact that the whorls on the tail are not separated by intercalary scales dorsally divides *Uromastix* and all other species in the tribe *Uromastyxini tribe nov.* (including *Dicksmithsaurus gen. nov.*) from the genera within the tribe *Borgsauriini tribe nov.*

Distribution: *Dicksmithsaurus subgen. nov.* are only known from north-west Somalia, eastern Egypt, Israel, Saudi Arabia and north-west Yemen.

Stokessaurus subgen. nov. are only positively known from coastal Oman.

Mooressaurus subgen. nov. are only positively known from South Algeria, Mali, Niger and South-west Libya.

Etiology: Named in honour of wealthy Australian businessman Dick Smith, the former owner of the electronics stores "Dick Smith Electronics". In Hoser (1991) I wrote of the ecological and social disasters likely to arise should Australian overpopulation get worse than it was at the time.

Since then the Australian government has worsened the environmental destruction by paying people to breed, with various ridiculous "baby bonus" schemes, which make old fashioned prostitution (sex for cash) seem poor by comparison.

As a result, Australia is beset by overcrowding in the cities and ongoing extinctions of fauna. This is a pattern being replicated worldwide.

For advocating a cessation of the population growth policies of Australian governments, I have faced malicious criminal charges and repeatedly been held up for public hatred.

Dick Smith, protected from harassment by government-backed henchmen posing as law-enforcement agents due to his immense personal wealth has taken up the environmental challenges caused by overpopulation. To his credit he has made a number of television shows spreading the message of population restraint. It is therefore fitting that a wild animal taxon group threatened by this very overpopulation (outside Australia in this case) be named in his honour.

Content: *Dicksmithsaurus macfadyeni* (Parker, 1932) (type species); *D. alfredschmidti* (Wilms and Böhme, 2001); *D. geyri* (Müller, 1922); *D. ornata* (Heyden, 1827); *D. philbyi* (Parker, 1938); *D. thomasi* (Parker, 1930).

SUBGENUS DICKSMITHSAURUS SUBGEN. NOV.

Type species: *Uromastix macfadyeni* Parker, 1932.

Diagnosis: The subgenus *Dicksmithsaurus subgen. nov.* is best defined by separation of each of the described subgenera, (within *Dicksmithsaurus gen. nov.*) including for *Dicksmithsaurus subgen. nov.* each diagnosis given herein therefore separating not just the subgenus from others within the genus, but also from all other *Uromastyxini tribe nov.* species.

Dicksmithsaurus subgen. nov. are defined by the following suite of characters:

Has preanofemoral pores; the tail is long being 48-103% of SVL, and when viewed from above it appears to be elongated; the last 12-21 tail whorls formed of continuous scale rows; anterior margin of ear opening has enlarged scales (subgenus *Dicksmithsaurus subgen. nov.*).

The other two subgenera within *Dicksmithsaurus gen. nov.* are diagnosed and defined as follows:

1/ Has preanofemoral pores; the tail is short being 25-35% of the SVL and when viewed from above it appears to be disk-shaped (subgenus *Stokessaurus subgen. nov.*), or:

2/ Has preanofemoral pores; the tail is long being 70-98% of the SVL, and when viewed from above it appears to be an elongated shape; the last 2-5 tail whorls formed of continuous scales rows; 138-227 scales at midbody, 68-112 ventrals between gular and inguinal fold; tail with 20-24 whorls (subgenus *Mooressaurus subgen. nov.*).

The lizard genus *Uromastyx* Merrem, 1820 (now divided to include other genera including *Dicksmithsaurus gen. nov.*) has until recently been diagnosed as follows:

Acrodont dentition, with the premaxillary bone forming in adult specimens a sharp, tooth-like structure replacing the incisive teeth. Tail scalation arranged in distinct whorls, which are not separated by intercalary scales dorsally. The fact that the whorls on the tail are not separated by intercalary scales dorsally divides *Uromastyx* and all other species in the tribe *Uromastyxiini tribe nov.* (including *Dicksmithsaurus gen. nov.*) from the genera within the tribe *Borgsauriini tribe nov.*

Distribution: *Dicksmithsaurus subgen. nov.* are only known from north-west Somalia, eastern Egypt, Israel, Saudi Arabia and north-west Yemen.

Etymology: See for the genus *Dicksmithsaurus gen. nov.*

Content: *Dicksmithsaurus (Dicksmithsaurus) macfadyeni* (Parker, 1932) (type species); *D. (Dicksmithsaurus) ornata* (Heyden, 1827); *D. (Dicksmithsaurus) philbyi* (Parker, 1938).

SUBGENUS STOKESSAURUS SUBGEN. NOV.

Type species: *Uromastix thomasi* Parker, 1932.

Diagnosis: The genus *Dicksmithsaurus subgen. nov.* is best defined by separation of each of the described subgenera, (within *Dicksmithsaurus gen. nov.*) including for *Stokessaurus subgen. nov.* each diagnosis given herein therefore separating not just the relevant subgenus from others within the genus, but also from all other *Uromastyxiini tribe nov.* species.

Stokessaurus subgen. nov. are defined by the following suite of characters:

1/ Has preanofemoral pores; the tail is short being 25-35% of the SVL and when viewed from above it appears to be disk-shaped (subgenus *Stokessaurus subgen. nov.*).

The other two subgenera within *Dicksmithsaurus gen. nov.* are diagnosed and defined as follows:

1/ Has preanofemoral pores; the tail is long being 48-103% of SVL, and when viewed from above it appears to be elongated; the last 12-21 tail whorls formed of continuous scale rows; anterior margin of ear opening has enlarged scales (subgenus *Dicksmithsaurus subgen. nov.*).

2/ Has preanofemoral pores; the tail is long being 70-98% of the SVL, and when viewed from above it appears to be an elongated shape; the last 2-5 tail whorls formed of continuous scales rows; 138-227 scales at midbody, 68-112 ventrals between gular and inguinal fold; tail with 20-24 whorls (subgenus *Mooressaurus subgen. nov.*).

The lizard genus *Uromastyx* Merrem, 1820 (now divided to include other genera including *Dicksmithsaurus gen. nov.*) has until recently been diagnosed as follows:

Acrodont dentition, with the premaxillary bone forming in adult specimens a sharp, tooth-like structure replacing the incisive teeth. Tail scalation arranged in distinct whorls, which are not separated by intercalary scales dorsally. The fact that the whorls on the tail are not separated by intercalary scales dorsally divides *Uromastyx* and all other species in the tribe *Uromastyxiini tribe nov.* (including *Stokessaurus subgen. nov.*) from the genera within the tribe *Borgsauriini tribe nov.*

Distribution: Only positively known from coastal Oman.

Etymology: Named in honour of Paul Stokes, of Melbourne, Victoria, Australia. Through his role as owner of the retail pet store "Amazing Amazon" in Springvale Road, Glen Waverley, Paul and his team have made a positive contribution to animal welfare by going the extra mile in terms of helping clients properly care for their pet reptiles and fish. Private ownership of animals is an important first step in fostering a desire for people to want to conserve wild animals as outlined in Hoser (1991).

Content: *Dicksmithsaurus (Stokessaurus) thomasi* (Parker, 1930) (monotypic).

SUBGENUS MOORESAURUS SUBGEN. NOV.

Type species: *Uromastix geyri* Müller, 1922.

Diagnosis: The subgenus *Dicksmithsaurus subgen. nov.* is best defined by separation of each of the described subgenera, (within *Dicksmithsaurus gen. nov.*) including *Mooressaurus subgen. nov.*

Therefore each diagnosis given herein separates not just the subgenus from others within the genus, but also from all other *Uromastyxiini tribe nov.* species.

Mooressaurus subgen. nov. are defined by the following suite of characters:

Has preanofemoral pores; the tail is long being 70-98% of the SVL, and when viewed from above it appears to be an elongated shape; the last 2-5 tail whorls formed of continuous scales rows; 138-227 scales at midbody, 68-112 ventrals between gular and inguinal fold; tail with 20-24 whorls (subgenus *Mooressaurus subgen. nov.*).

The other two subgenera within *Dicksmithsaurus gen. nov.* are diagnosed and defined as follows:

1/ Has preanofemoral pores; the tail is short being 25-35% of the SVL and when viewed from above it appears to be disk-shaped (subgenus *Stokessaurus subgen. nov.*).

2/ Has preanofemoral pores; the tail is long being 48-103% of SVL, and when viewed from above it appears to be elongated; the last 12-21 tail whorls formed of continuous scale rows; anterior margin of ear opening has enlarged scales (subgenus *Dicksmithsaurus subgen. nov.*).

The lizard genus *Uromastyx* Merrem, 1820 (now divided to include other genera including *Dicksmithsaurus gen. nov.*) has until recently been diagnosed as follows:

Acrodont dentition, with the premaxillary bone forming in adult specimens a sharp, tooth-like structure replacing the incisive teeth. Tail scalation arranged in distinct whorls, which are not separated by intercalary scales dorsally. The fact that the whorls on the tail are not separated by intercalary scales dorsally divides *Uromastyx* and all other species in the tribe *Uromastyxiini tribe nov.* (including *Mooressaurus subgen. nov.*) from the genera within the tribe *Borgsauriini tribe nov.*

Distribution: Only positively known from South Algeria, Mali, Niger and South-west Libya.

Etymology: Named in honour of Ben Moore, of Melbourne, Victoria, Australia. Through his role as manager of the retail pet store "Amazing Amazon" in Springvale Road, Glen Waverley, Ben Moore and his team have made a positive contribution to animal welfare by going the extra mile in terms of helping clients properly care for their pet reptiles and fish. Private ownership of animals is an important first step in fostering a desire for people to want to conserve wild animals as outlined in Hoser (1991).

Content: *Dicksmithsaurus (Mooressaurus) geyri* (Müller, 1922) (type species); *D. (Mooressaurus) alfredschmidti* (Wilms and Böhme, 2001).

GENUS SAARA GRAY, 1845.

Type species: *Uromastix hardwickii* Gray, 1827.

Diagnosis: All lizards in the tribe *Borgsauriini tribe nov.* are defined as follows:

Acrodont dentition, with the premaxillary bone forming in adult specimens a sharp, tooth-like structure replacing the incisive teeth. Tail scalation arranged in distinct whorls, which are separated by 1-6 rows of intercalary scales dorsally.

It is the separation of the whorls on the tail by 1-6 rows of intercalary scales dorsally that separates this tribe from *Uromastyxiini tribe nov.* and also until now was the sole diagnostic character used to define and separate the genus *Saara* Gray, 1845 from other similar species.

With the genus *Saara* being divided three ways in this paper, it is best to define each genus as newly defined herein as follows:

Saara Gray, 1845 is now distinguished from the genera *Centrotrachelus* Strauch, 1863 and *Borgsaurus gen. nov.* by having 2-6 rows of keeled intercalary scales separating each tail whorl dorsally. *Saara* is further separated from the genera *Centrotrachelus* Strauch, 1863 and *Borgsaurus gen. nov.* by having a tail with 29-36 primary whorls (as opposed to less than 28 for the other two genera) and dorsal scalation interspersed with irregular, only slightly enlarged, tubercular scales as opposed to dorsal scalation with transverse rows of conspicuously enlarged tubercular scales in *Centrotrachelus* Strauch, 1863 and *Borgsaurus gen. nov.*

Centrotrachelus Strauch, 1863 is distinguished from the genera *Saara* Gray, 1845 and *Borgsaurus gen. nov.* by having 1-2 rows of unkeeled intercalary scales separating each tail whorl dorsally and having 8-13 preanofemoral pores. *Centrotrachelus* is further distinguished by having slightly enlarged scales at front edge of ear opening and 7-10 scales in a transverse row on the dorsal surface of the tail base.

Borgsaurus gen. nov. is distinguished from the genera *Saara* Gray, 1845 and *Centrotrachelus* Strauch, 1863 by having 1-2 rows of unkeeled intercalary scales separating each tail whorl dorsally and having 14-20 preanofemoral pores. *Borgsaurus gen. nov.* is further separated by having no enlarged scales at the front edge of the ear opening and 12 scales in a transverse row on the dorsal surface of the tail base.

Distribution: Afghanistan, Pakistan and India.

Content: *Saara hardwickii* Gray, 1827 (monotypic).

GENUS CENTROTRACHELUS STRAUCH, 1863.

Type species: *Centrotrachelus asmussi* Strauch, 1863.

Diagnosis: All lizards in the tribe Borgsauriini *tribe nov.* are defined as follows:

Acrodont dentition, with the premaxillary bone forming in adult specimens a sharp, tooth-like structure replacing the incisive teeth. Tail scalation arranged in distinct whorls, which are separated by 1-6 rows of intercalary scales dorsally.

It is the separation of the whorls on the tail by 1-6 rows of intercalary scales dorsally that separates this tribe from Uromastyxiini *tribe nov.* and also until now was the sole diagnostic character used to define and separate the genus *Saara* Gray, 1845 from other similar species.

With the genus *Saara* being divided three ways in this paper, it is best to define each genus as newly defined herein as follows:

Centrotrachelus Strauch, 1863 is distinguished from the genera *Saara* Gray, 1845 and *Borgsaurus gen. nov.* by having 1-2 rows of unkeeled intercalary scales separating each tail whorl dorsally and having 8-13 preanofemoral pores. *Centrotrachelus* is further distinguished by having slightly enlarged scales at front edge of ear opening and 7-10 scales in a transverse row on the dorsal surface of the tail base.

Saara Gray, 1845 is now distinguished from the genera *Centrotrachelus* Strauch, 1863 and *Borgsaurus gen. nov.* by having 2-6 rows of keeled intercalary scales separating each tail whorl dorsally. *Saara* is further separated from the genera *Centrotrachelus* Strauch, 1863 and *Borgsaurus gen. nov.* by having a tail with 29-36 primary whorls (as opposed to less than 28 for the other two genera) and dorsal scalation interspersed with irregular, only slightly enlarged, tubercular scales as opposed to dorsal scalation with transverse rows of conspicuously enlarged tubercular scales in *Centrotrachelus* Strauch, 1863 and *Borgsaurus gen. nov.*

Borgsaurus gen. nov. is distinguished from the genera *Saara* Gray, 1845 and *Centrotrachelus* Strauch, 1863 by having 1-2 rows of unkeeled intercalary scales separating each tail whorl dorsally and having 14-20 preanofemoral pores. *Borgsaurus gen. nov.* is further separated by having no enlarged scales at the front edge of the ear opening and 12 scales in a transverse row on the dorsal surface of the tail base.

Distribution: Afghanistan, Pakistan and Southern Iran.

Content: *Centrotrachelus asmussi* Strauch, 1863 (monotypic).

GENUS BORGSAURUS GEN. NOV.

Type species: *Centrotrachelus loricatus* Blanford, 1874.

Diagnosis: All lizards in the tribe Borgsauriini *tribe nov.* are defined as follows:

Acrodont dentition, with the premaxillary bone forming in adult specimens a sharp, tooth-like structure replacing the incisive teeth. Tail scalation arranged in distinct whorls, which are separated by 1-6 rows of intercalary scales dorsally.

It is the separation of the whorls on the tail by 1-6 rows of intercalary scales dorsally that separates this tribe from Uromastyxiini *tribe nov.* and also until now was the sole diagnostic character used to define and separate the genus *Saara* Gray, 1845 from other similar species.

With the genus *Saara* being divided three ways in this paper, it is best to define each genus as newly defined herein as follows:

Borgsaurus gen. nov. is distinguished from the genera *Saara* Gray, 1845 and *Centrotrachelus* Strauch, 1863 by having 1-2 rows of unkeeled intercalary scales separating each tail whorl dorsally and having 14-20 preanofemoral pores. *Borgsaurus gen. nov.* is further separated by having no enlarged scales at the front edge of the ear opening and 12 scales in a transverse row on the dorsal surface of the tail base.

Centrotrachelus Strauch, 1863 is distinguished from the genera *Saara* Gray, 1845 and *Borgsaurus gen. nov.* by having 1-2 rows of unkeeled intercalary scales separating each tail whorl dorsally and having 8-13 preanofemoral pores. *Centrotrachelus* is further distinguished by having slightly enlarged scales at front edge of ear opening and 7-10 scales in a transverse row on the dorsal surface of the tail base.

Saara Gray, 1845 is now distinguished from the genera *Centrotrachelus* Strauch, 1863 and *Borgsaurus gen. nov.* by having 2-6 rows of keeled intercalary scales separating each tail whorl dorsally. *Saara* is further separated from the genera *Centrotrachelus* Strauch, 1863 and *Borgsaurus gen. nov.* by having a tail with 29-36 primary whorls (as opposed to less than 28 for the other two genera) and dorsal scalation interspersed with irregular, only slightly enlarged, tubercular scales as opposed to dorsal scalation with transverse rows of conspicuously enlarged tubercular scales in *Centrotrachelus* Strauch, 1863 and *Borgsaurus gen. nov.*

Distribution: Iraq and south-west Iran.

Etymology: Named in honour of Matt Borg of Mount Cottrell, on the outskirts of Melbourne, Victoria, Australia in recognition for his many services to Australian herpetology and wildlife conservation. This has most notably been through the breeding of enormous quantities of rodents used to feed collections of wildlife held for research and educational purposes. This includes food eaten by the many species held and used by Snakebusters, Australia's best reptile shows.

Content: *Borgsaurus loricatus* Blanford, 1874 (monotypic).

TRIBE UROMASTYXIINI TRIBE NOV.

(Terminal taxon: *Lacerta aegyptia* Forskal, 1775)

Diagnosis: The lizard subfamily Uromastycinae Theobald, 1868 is most easily defined as follows:

Acrodont dentition, with the premaxillary bone forming in adult specimens a sharp, tooth-like structure replacing the incisive teeth. Tail scalation is arranged in distinct whorls.

For the tribe Uromastyxiini *tribe nov.* these whorls are not separated by intercalary scales dorsally.

For the tribe Borgsauriini *tribe nov.* (the only other tribe in the subfamily Uromastycinae) these whorls are separated by 1-6 rows of intercalary scales dorsally.

In further detail the tribe Uromastyxiini *tribe nov.* is also defined as follows:

Tympanum large, vertically elliptic and distinct. Incisors large, uniting in the adult into one or two cutting-teeth, separated from the molars by a toothless interspace. Body depressed, without crest. No gular pouch; a transverse gular fold. Tail short, depressed, covered with whorls of large spinose scales. Praeanal and femoral pores present.

The head is small, feebly depressed, with a short snout and obtuse canthus rostralis; nostril large, directed backwards, nearer the end of the snout than the eye; upper head-scales smooth, much larger than those on the body, smallest on supraorbital region; occipital not enlarged; labials small and numerous. Neck strongly plicate. Limbs short and thick; hind limb with spinose conical tubercles; digits short and armed with strong claws. Scales on upper surface of body very small, on belly larger, fiat, smooth, juxtaposed or subimbricate.

Distribution: Species until now placed in the genus *Uromastix* (now placed in the tribe Uromastyxiini *tribe nov.*) inhabit a range stretching through most of North Africa and the Middle East, ranging as far east as Iran. The three species found further east in

dry habitats in southwest Asia, ranging from Iran to north-western India have more recently been placed in the genus *Saara* (Borgsauriini *tribe nov.*).

Content: *Uromastix* Merrem, 1820 (type genus); *Aporoscelis* Boulenger, 1885; *Dicksmithsaurus gen. nov.*; *Euanedwardssaurus gen. nov.*.

TRIBE BORSAURIINI TRIBE NOV.

(Terminal taxon: *Centrotrachelus loricatus* Blanford, 1874)

Diagnosis: All lizards in the tribe Borgsauriini *tribe nov.* are defined as follows:

Acrodont dentition, with the premaxillary bone forming in adult specimens a sharp, tooth-like structure replacing the incisive teeth. Tail scalation arranged in distinct whorls, which are separated by 1-6 rows of intercalary scales dorsally.

It is the separation of the whorls on the tail by 1-6 rows of intercalary scales dorsally that separates this tribe from Uromastyxiini *tribe nov.* and also until now was the sole diagnostic character used to define and separate the genus *Saara* Gray, 1845 from other similar species.

With the genus *Saara* being divided three ways in this paper (the trio being the entire content of this new tribe), it is best to define each genus as newly defined herein as follows:

Borgsaurus gen. nov. is distinguished from the genera *Saara* Gray, 1845 and *Centrotrachelus* Strauch, 1863 by having 1-2 rows of unkeeled intercalary scales separating each tail whorl dorsally and having 14-20 preanofemoral pores. *Borgsaurus gen. nov.* is further separated by having no enlarged scales at the front edge of the ear opening and 12 scales in a transverse row on the dorsal surface of the tail base.

Centrotrachelus Strauch, 1863 is distinguished from the genera *Saara* Gray, 1845 and *Borgsaurus gen. nov.* by having 1-2 rows of unkeeled intercalary scales separating each tail whorl dorsally and having 8-13 preanofemoral pores. *Centrotrachelus* is further distinguished by having slightly enlarged scales at front edge of ear opening and 7-10 scales in a transverse row on the dorsal surface of the tail base.

Saara Gray, 1845 is now distinguished from the genera *Centrotrachelus* Strauch, 1863 and *Borgsaurus gen. nov.* by having 2-6 rows of keeled intercalary scales separating each tail whorl dorsally. *Saara* is further separated from the genera *Centrotrachelus* Strauch, 1863 and *Borgsaurus gen. nov.* by having a tail with 29-36 primary whorls (as opposed to less than 28 for the other two genera) and dorsal scalation interspersed with irregular, only slightly enlarged, tubercular scales as opposed to dorsal scalation with transverse rows of conspicuously enlarged tubercular scales in *Centrotrachelus* Strauch, 1863 and *Borgsaurus gen. nov.*

Distribution: *Borgsaurus gen. nov.* is found in Iraq and south-west Iran.

Centrotrachelus Strauch, 1863 is found in Afghanistan, Pakistan and Southern Iran.

Saara Gray, 1845 is found in Afghanistan, Pakistan and India.

Etymology: See for the genus *Borgsaurus gen. nov.* (above).

Content: *Borgsaurus gen. nov.* (type genus); *Centrotrachelus* Strauch, 1863; *Saara* Gray, 1845.

CONFLICT OF INTEREST

This author reports no conflict of interest in terms of any material within this paper.

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