

Divisions of the Asian Colubrid snake genera *Xenochrophis*, *Dendrelaphis* and *Boiga* (Serpentes: Colubridae).

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ABSTRACT

Numerous reviewed published studies have shown that the three genera of (mainly) Asian Colubrid snakes, *Xenochrophis*, *Dendrelaphis* and *Boiga* are clearly paraphyetic. As a result, new genera and subgenera are created and named according to the Zoological Code to accommodate the divergent members.

Similarly a new species and two new subspecies of Tree Snake, both from the New Guinea region are described and named according to the Zoological Code.

Keywords: Taxonomic revision; new genera; genus; species; *Xenochrophis*; *Dendrelaphis*; *Boiga*; *Rentonius*; *Jackyhoserae*; *Charlespiersonus*; *Macmillanus*; *Downieea*; *Dorisious*; *Mulvanyus*; *tyeipperae*; *lizelliotta*; systematics.

INTRODUCTION

Numerous studies have been completed in terms of Asian Colubrid genera *Xenochrophis*, *Dendrelaphis* and *Boiga*. However almost without exception the taxonomic studies have been mainly preoccupied with delineating species rather than genera.

Alternatively the genera themselves have been scrutinized from the perspective of their positions in higher taxonomic hierarchies at the family level and beyond (e.g. Lawson et al. 2005, Pyron et al. 2011, Vidal et al. 2007), rather than whether or not snakes are appropriately placed within given genera which have been previously assigned.

However in the wake of several molecular studies of snakes within these genera, including Pyron et al. (2011), it's clear that they are paraphyletic at the genus level.

The genetic evidence is also confirmed by a view of the morphology of component species as well as the somewhat different habits of the member species.

Each of the three above-named genera has been assessed in terms of placement of component species.

For the genus *Xenochrophis* the molecular data is conclusive and indicates the split as indicated in this paper.

For the large and obvious composite genera *Dendrelaphis* and *Boiga*, molecular data is somewhat incomplete, but when combined with morphological data, shows that these genera should also be split.

For these genera, I have taken a conservative position and only

named the most obviously divergent taxa.

In each genus, there may be other species that should be either removed from the nominate genus, or at least placed in a separate subgenus.

GENUS *XENOCHROPHIS* GÜNTHER, 1864

Most snakes within the Keelback genus *Xenochrophis* have been shuffled between several genera until 1960.

In that year, Malnate (1960) divided the former genus *Natrix* Laurenti, 1768 into five genera and revalidated the name *Fowlea* Theobald, 1868 for the species, *F. piscator*, *F. punctulata* and *F. vittata*. For this placement he relied on hemipenial structure, form of the maxillary teeth and position of the nostrils.

In 1965, Malmate and Minton (1965), discarded *Fowlea* in favor of the earlier named genus *Xenochrophis* Günther, 1864, by including the type species *Psammophis cerasogaster* Cantor, 1839, and placing it in the same genus as the other three species.

Vogel and David (2006) worked on morphological variation in the genus, subdividing the group into several species.

As of early 2012, there are thirteen widely recognized species within the genus.

Important published studies on the snakes within *Xenochrophis* include, Blake (1995), Blyth (1863), Boie (1827), Boulenger (1890, 1891, 1893), Captain and Patel (1998), Chanard et al. (1999), Cox et al. (1998), Das and De Silva (2005), David and

Vogel (1996, 2010), De Haas (1949), de Lang and Vogel (2005), Dutt (1970), Frith (1977), Geissler et. al. (2011), Glässer-Trobisch and Trobisch (2011), Gmelin (1789), Gravenhorst (1807), Günther (1858), Joseph et. al. (2005), Khan (2002), Kopstein (1938), Kramer (1977), Kusuma et. al. (2010), Lazell (2002), Malnate (1960), Malnate and Minton (1965), Malnate and Underwood (1988), Manthey and Grossmann (1997), Mohapatra et. al. (2010), Nguyen et. al. (2009), Pauwels et. al. (2001), Pratyush et. al. (2010), Purkayastha et. al. (2010), Richards (1918), Sharma (2004), Sourav and Purkayastha (2011), Taylor (1965), Vogel and David (2006), Wall (1905a, 1905b, 1907, 1908a, 1921a), Whittaker and Captain (2004), Zhao and Adler (1993), Ziegler (2002), Zug et. al. (2006).

Phylogenetic and molecular studies on the genus have been limited, but Pyron et. al. (2011) found that the species *vittatus* to be widely divergent of the others in the genus, being more closely related to Keelback snakes of the genus *Rhabdophis* Fitzinger, 1843 than to other *Xenochrophis*.

Both genera are separated from *Amphiesma* by their larger eye.

However the species *vittatus* is significantly divergent from both genera (*Rhabdophis* and *Xenochrophis*), both groups of snake being considerably more stout in build than *vittatus*. As it is not tenable to merge the two genera and also include the divergent taxon *vittatus*, the most sensible course of action is to create a new genus for the species *vittatus*.

The molecular data is also in accordance with observations of the morphology and behavior of *vittatus* as compared to other species within *Xenochrophis*.

Typical *Xenochrophis* species such as *X. piscator* are moderately thick-set and pugnacious in behavior. The same applies for *Rhabdophis* species.

By contrast *vittatus* is of thin build and rarely inclined to bite when handled.

With most of *Xenochrophis* being found in the region to the west and north of where *vittatus* occurs and most *Rhabdophis* species found to the north, it is clear that *vittatus* is part of a separate apparently monophyletic clade.

On that basis, the taxon *vittatus* is placed in a (presently) monotypic genus defined according to the Zoological Code (Ride et. al. 1999), below.

GENUS RENTONUS GEN. NOV.

Type species: *Coluber vittatus* Linnaeus, 1758

(Known in most contemporary texts as *Xenochrophis vittatus*)

Diagnosis: This snake is easily separated from all other species within the genus *Xenochrophis*.

All snakes within what's left of the genus *Xenochrophis* are easily separated from *Rentonus* gen. nov. by the presence of a distinctive nuchal marking that is one of the following four, A/ An inverted "V"-shape, where the marking opens anteriorly on the nape, B/ A direct "V"-shape where the marking opens on the nape, C/ A straight, broad, often subrectangular crossbar, D/ A widely open "U"-shape or even double "YY"-shape present in populations from Indonesia and the Andaman Islands, or as an alternative to the preceding the snakes lack such markings as part of a patternless body in specimens of two species from the Indian Subcontinent.

By contrast to the preceding, *Rentonus* gen. nov. are characterized by a lack of nuchal markings conforming to the previous description, with a head and neck generally consisting of a dark colour with large white flecks, but not with any well-defined obvious shape or pattern, although in the nuchal region these tend to join to form the beginnings of the lines that run down the dorsum of the body.

Rentonus is further separated from *Xenochrophis* by the presence of two distinct thick white bars running from the lip to the top of the head, one in front of the eye and one behind. A

third half-length bar is behind the second bar. No *Xenochrophis* have this configuration of white bars on the head.

As mentioned already, *Rentonus* gen. nov. differs from snakes remaining in *Xenochrophis* by their slimmer build and more even temperament.

The genus is oviparous usually having 9-12 eggs per clutch. Hatchlings measure about 13 cm in total length, with adult males averaging about 50 cm and females 70 cm. The diet is dominantly fish and frogs.

Colouration of *Rentonus* gen. nov. is distinctive. On the dorsal surface are four pale yellow-brown stripes against a black background : these persist along the entire length of the body and tail. The chin, lips, neck and all ventral scales are distinctively barred black and white, including the diagnostic bars mentioned above.

The venter of this taxon is also distinctive (from all *Xenochrophis*) in that it is white with each plate very thickly marginated with black, versus at best only thinly marginated black on subcaudals seen in some *Xenochrophis piscator*.

The taxon has 9 supralabials and 19 mid-body rows, both traits common to other species of *Xenochrophis*.

Important publications relevant to this taxon include, Blake (1995), Boulenger (1893), De Haas (1949), de Lang and Vogel (2005), Glässer-Trobisch and Trobisch (2011), Kopstein (1938), Linnaeus (1758) and Manthey and Grossmann (1997).

Distribution: The single species within the genus is believed to occur in Sumatra, Java and Borneo. It has been found in grassy areas of Singapore, where it's locally common, but is considered an introduced species (Lim and Lim 1992).

It is common in Java.

Common name: Striped Keelback.

Etymology: Named in honour of Ian Renton of Paradise, South Australia. For more than 20 years he has performed an invaluable public service with his company "Snake-away Services" in the form of emergency snake rescue and removals in Adelaide, as well as reptile education in a country (Australia) that desperately needs accurate information on venomous snakes to be disseminated.

Species within the genus *Rentonus* gen. nov.

Rentonus is monotypic for the type species *R. vittatus*.

Species now within the genus *Xenochrophis* Günther, 1864

Xenochrophis cerasogaster (Cantor, 1839) (Type species)

Xenochrophis asperimus (Boulenger, 1891)

Xenochrophis bellula (Stolicza, 1871)

Xenochrophis flavipunctatus (Hallowell, 1860)

Xenochrophis maculatus (Edeling, 1864)

Xenochrophis melanzostus (Gravenhorst, 1807)

Xenochrophis piscator (Schneider, 1799)

Xenochrophis punctulatus (Günther, 1858)

Xenochrophis sanctijohannis (Boulenger, 1890)

Xenochrophis schnurrenbergeri Kramer, 1977

Xenochrophis trianguligerus (Boie, 1827)

Xenochrophis tyleri (Blyth, 1863)

GENUS DENDRELAPHIS BOULENGER, 1890

The so-called tree snakes or bronzebacks are a group of over 20 moderate-to-large diurnal species found in the region from India across Southern Asia into Australia. Most described species come from south-east Asia.

As a group, they have been of taxonomic interest in the last two decades with numerous new species described by Vogel and others.

All are similar in build and habits, being generally slender, slightly laterally compressed with long-whip-like tails, head barely distinct from the neck, large eye with a round pupil. The ventrals exhibit a sharp ridge running down either side presenting an "arch-shape" in cross section which enables

traction when climbing trees and the like.

Color varies strongly between species and within wide-ranging species also varies depending on locality. Scalation is smooth, with apical pits, there are usually 13 dorsal mid body rows, arranged obliquely.

When threatened, snakes will puff up their neck and fore body, swelling it vertically, often yielding different colored skin between the now parted scales.

At the genus level the group has been relatively stable in recent years in spite of the growing number of named species.

The type species, the Striped Bronzeback *Dendrelaphis caudolineatus* (Gray, 1834) is physically quite different from the Australia/New Guinea species, being of obviously thinner build and glossier scalation.

These snakes were separated into the three below groups by McDowell 1984, based on hemipenal morphology and other attributes deemed herein as significant differences necessitating taxonomic recognition.

As a result of these obvious differences, six Australia/New Guinea species, plus another newly described one (see below) from Australia/New Guinea are herein placed in the newly created genus for all seven species called

Charlespiersonserpens gen. nov. Three of these species are further placed within newly named subgenera, one subgenus *Downieea* includes one species *papuenis*, while the other subgenus, *Macmillanus* gen. nov. includes the species *lorentzi* and a newly described congener, *Charlespiersonserpens* (*Macmillanus*) *jackyhoserae* sp. nov..

The genus *Dendrelaphis* as herein recognized is certainly composite and warranting further divisions at the subgenus level.

A list of currently recognized species remaining within this genus is provided below the summary for *Charlespiersonserpens* gen. nov..

The body of literature and published in relation to the genus *Dendrelaphis* as widely recognized is large. Key publications include, Anderson (1871), Auffenberg (1980), Auliya (2006), Baier (2005), Bergman (1955), Boie (1827), Boulenger (1886, 1888, 1890, 1894, 1895a, 1895b, 1897), Bourret (1935), Cohn (1905), Das (1999), Das and De Silva (2005), Daudin (1803), David and Vogel (1996), de Lang and Vogel (2005), de Rooij (1917), Deuve (1970), Devan-Song and Brown (2012), Doria (1817), Duméril et. al. (1854), Flower (1897, 1899), Frith (1977), Gadow (1909), Garman (1901), Gray (1825, 1826, 1835, 1841, 1842), Grismer et. al. (2008), Günther (1867, 1872), How and Kitchner (1997), How et. al. (1996), Iskandar and Colijn (2002), Janzen et. al. (2007), Koch (2011), Kuhl (1820), Lazell (2002), Lazell and Wu (1990), Leviton (1970), Lim and Cheong (2011), Lim and Ng (1999), Lidth De Jude (1911), Loveridge (1948), Macleay (1875, 1877, 1878, 1884), Malkmus et. al. (2002), Manthey and Grossmann (1997), McCoy (2006), McDowell (1984), McKay (2006), Meise and Hennig (1932), Mertens (1926, 1927, 1930), Obst (1977), Schmidt (1932), Sharma (2004), Smith (1943), Stejneger (1933), Sudasinghe (2010), Taylor (1950), Thompson and Thompson (2008), Tiwari and Biswass (1973), Tweedie (1983), van Rooijen and van Rooijen (2007), van Rooijen and Vogel (2008a, 2008b, 2008c, 2009, 2010), Vijayakumar and David (2006), Vogel (1995, 2010), Vogel and van Rooijen (2007, 2008, 2011a, 2011b, 2011c), Wall (1908b, 1910, 1913, 1921a, 1921b), Werner (1893), Whitaker et. al. (1982), Zeigler and Vogel (1999) and Zhao and Adler (1993).

GENUS CHARLESPIERSONSERPENS GEN. NOV.

Type Species: *Leptophis punctulatus* Gray, 1826

Diagnosis: A group of snakes separated from other *Dendrelaphis* by their generally heavier build (like-for-like) and slightly less glossy dorsal body shields (at same point of shedding cycle).

The following suite of characters identifies this genus: Variable dorsal colour, slightly lighter laterally, but all lack longitudinal black stripes on all or most of their body, labials and throat pale, 13 dorsal mid-body rows, all smooth and arranged obliquely, 156-221 ventrals, divided anal, 118-160 divided subcaudals, loreal present, 8-9 supralabials, with fourth and fifth or fifth and sixth in contact with the eye, 1 pre-ocular, 2 or 3 postoculars and have a medium or short hemipenis that doesn't extend past the fifteenth subcaudal.

Snakes within the genus *Dendrelaphis* have a higher average ventral count than seen in this genus *Charlespiersonserpens* gen. nov..

Furthermore for snakes within the genus *Dendrelaphis* only the fourth supralabial makes contact with the eye, with numbers 5 and 6 merely coming close, as opposed to the configuration given above for *Charlespiersonserpens* gen. nov..

Noteworthy is that two species within this genus, namely *papuenis* (Boulenger 1895) and *salomonis* (Günther, 1872) were in 1984 resurrected from synonymy with *punctulatus* and/or *calligatra* by McDowell in 1984, and again by Wells and Wellington in 1985, which has been upheld by later studies.

Distribution: The Australian/Papuan region of the Sahul Shelf.

Etymology: Americans historically have cherished the freedom of the individual.

Included here is the freedom of individuals to keep and study snakes and other wildlife. In recent years this right has come under threat from a raft of ridiculous bureaucratic impediments. In Australia in the early 1970's these rights were removed from most Australians. It was only as a result of the publication of two different books, *Smuggled* and *Smuggled-2* (Hoser 1993 and 1996) that led to these rights being restored to most Australians.

The success in Australia in terms of these books and their legislative outcomes reverberated around the world and in the case of the United States, meant that a major push to outlaw private ownership of reptiles in 1993 was also stopped in its tracks.

Charles Pierson as publisher of the first book, took an incredibly courageous step in publishing it.

For North Americans reading this, it should be noted that the Australian government (at all levels) has considerably more powers than their North American counterparts, including control of media and information flow to the public. Persons publishing material critical of government, even when totally true and correct, run the risk of immense fines, jail or similar. I have suffered both!

The book *Smuggled: The Underground Trade in Australia's Wildlife* (Hoser 1993) was (as totally expected), illegally banned by the NSW National Parks and Wildlife Service, (NPWS NSW) in May 1993. Only as a result of a supreme effort by Pierson and an extremely brave and courageous journalist Fia Cumming, the ban was lifted.

(Cumming subsequently lost her job as a result of this, but the book became a best-seller).

Fighting the ban ultimately cost Pierson his home in the expensive Sydney suburb of Mosman and he lost his business. However this huge life-altering sacrifice against the tyranny of a corrupt and oversized government wildlife control bureaucracy should be permanently recognized. This is especially so in the context of reptiles, those who choose to study them and their conservation, including those many people who have the right to keep live reptiles as pets, solely as a consequence of Pierson's selfless actions.

Pierson also put wildlife conservation on the global agenda, with the publication of the seminal works *Endangered Animals of Australia*, (Hoser 1991) and *Australian Reptiles and Frogs* (Hoser 1989), the latter used extensively by the late Steve Irwin

and other television "personalities", including Bruce George, Mark O'Shea, Chris Humfrey and others as a reference source to bring Australian animals to TV viewers globally.

Unfortunately as this paper goes to press in 2012 there are new assaults on the rights of reptile keepers and herpetologists both in the USA and Australia with new restrictions either passed or about to be passed in both jurisdictions.

Species within *Charlespiersonserpens* gen. nov.

Charlespiersonserpens punctulatus (Gray, 1826)

Charlespiersonserpens calligastra (Günther, 1867)

Charlespiersonserpens gastrosticus (Boulenger, 1894)

Charlespiersonserpens jackyhoserae sp. nov.

Charlespiersonserpens lorentzi (Lidith De Jeude, 1911)

Charlespiersonserpens papuensis (Boulenger, 1895)

Charlespiersonserpens salomonis (Günther, 1872)

**CHARLESPIERSONSERPENS GASTROSTICUS
TYEIPPERAE SUBSP. NOV.**

Holotype: Specimen number 95570 at the American Museum of Natural History (AMNH). The snake is a male from Masba Creek, Papua New Guinea, (elevation 2,100 feet) with 36 left maxillary teeth and 170 ventrals.

The relevant Museum is a government owned public facility that allows researchers access to their collections and the holotype specimen is already lodged with and belongs to this facility.

Paratypes: Specimen number 95569 at the American Museum of Natural History (AMNH). The snake is a juvenile from Kabwum, Papua New Guinea, (elevation 4,500 feet) with 37 left maxillary teeth and 164 ventrals.

Specimen number 66669 at the American Museum of Natural History (AMNH). The snake is a juvenile male from Gusiko, Papua New Guinea, with 34 left maxillary teeth and 170 ventrals.

The relevant Museum is a government owned public facility that allows researchers access to their collections and the paratype specimens are already lodged with and belongs to this facility.

Diagnosis: *Charlespiersonserpens gastrosticus tyeipperae* subsp. nov. is separated from the nominate form *Charlespiersonserpens gastrosticus gastrosticus* by having dark interstitial skin on the neck, without vertical white bars. This feature is not seen in *Charlespiersonserpens gastrosticus gastrosticus*.

Charlespiersonserpens gastrosticus tyeipperae subsp. nov. has significantly more maxillary teeth than the nominate form, (34-37, mean 35.667 in *Charlespiersonserpens gastrosticus tyeipperae* subsp. nov., versus 30-36, mean 32.636 in *Charlespiersonserpens gastrosticus gastrosticus*).

Charlespiersonserpens gastrosticus tyeipperae subsp. nov. and the form *Charlespiersonserpens gastrosticus gastrosticus* are separated from other similar species, including all other *Charlespiersonserpens* by the following suite of characters: There is a dark stripe present along the upper edge of the lip scales, separating light labial scales from darker pigment of dorsum of head; scales of dorsum of head lack pits, average total body length of .7 to 1 metre and never exceeding 1.3 metres.; more than 140 subcaudals, large nostril and completely divided nasal scale; ventrals 160-180, 147-164 subcaudals; 30-41 maxillary teeth, last 3-5 the longest; a notably and diagnostically short and wide brain case, an index of which is the shape of the part of the supraoccipital bone exposed between the jaw adductor muscles covering its lateral edges and anterior to the axial muscles that cover the rear portion of the bone; the exposed supraorbital is much broader than long (easily ascertained by slitting the skin just behind the parietal scutes).

The maxillary teeth count alone easily separates *Charlespiersonserpens gastrosticus* from *Charlespiersonserpens lorentzi*, *C. calligastra* and *C. papuensis*.

The ventral count of 160-180 is diagnostically lower than for *C. punctulatus*.

C. salomonis is separated from *C. gastrosticus* by its higher ventral and subcaudal counts.

These are 173-191 ventrals and 124-166 subcaudals in *C. salomonis*, versus 160-180 ventrals and 147-164 subcaudals in *C. gastrosticus*.

C. gastrosticus is found in highland and montane habitats and Milne Bay (Normanby and Fergusson Islands), versus lowland island habitats of the North Solomons and Milne Bay (Misima Island) in *C. salomonis*.

Etymology: Named in honour of Ty Eipper, wife of herpetologist Scott Eipper, now both based in Brisbane, Queensland who for many years has worked in the reptile education industry and for her other services to herpetology.

SUBGENUS DOWNIEEA GEN. NOV.

Type Species: *Dendrelaphis papuensis* Boulenger, 1895

Diagnosis: Separated from all other similar species, including all other six members of the genus *Charlespiersonserpens* gen. nov. by the following suite of characters: There is a dark stripe present along the upper edge of the lip scales, separating light labial scales from darker pigment of dorsum of head; scales of dorsum of head lack pits, average total body length of .7 to 1 metre and never exceeding 1.3 metres.; fewer than 140 subcaudals, 183-203 ventrals; pale vertebral stripe is absent or present, a small nostril, the nasal scale is not completely divided; black interstitial skin on the neck and 19-27 maxillary teeth.

This subgenus is also separated from all other *Charlespiersonserpens* and *Dendrelaphis* on the basis of unique hemipenial morphology.

In this subgenus the hemipenis organ is of moderate length (ending at subcaudal 8-13), with a strictly terminal attachment of the retractor longus, so that there is no suggestion of terminal awn; distally the organ has numerous shallow calyces with many small spines on their borders; proximally there are one to five transverse whorls of large spines, some of which are at least equal to one subcaudal in length. With the exception of specimens from Woodlark Island, specimens have a distinct transverse fold between the calyculate and spinose zones, an obvious homologue of the fold between the (smooth) calyces and small proximal spines seen in some other *Charlespiersonserpens* gen. nov.. No such fold is evident in Woodlark Island specimens or those from Bougainville. These are herein described as a new subspecies.

The subgenus *Downieea* subgen. nov. is monotypic for the species *D. papuensis*.

Downieea is endemic to Island New Guinea and immediately adjacent satellite islands.

Etymology: The subgenus is named in honour of Meg Downie of Donvale, Victoria who tried with great difficulty to remove corruption from the Manningham (Melbourne) council in her role as elected councilor, as well as for her services towards improving animal welfare, in particular domestic dogs.

**CHARLESPIERSONSERPENS (DOWNIEEA) PAPUENSIS
LIZELLIOTTAE SUBSP. NOV.**

Holotype: Specimen number 42400, a male, at the American Museum of Natural History (AMNH) from Bougainville, New Guinea.

The relevant Museum is a government owned public facility that allows researchers access to their collections and the holotype specimen is already lodged with and belongs to this facility.

Diagnosis: This taxon would normally identify as *D. papuensis*, from which it is separated definitively by hemipenial morphology.

In this species the hemipenis organ is of moderate length (ending at subcaudal 8-12), with a strictly terminal attachment

of the retractor longus, so that there is no suggestion of terminal awn; distally the organ has numerous shallow calyces with many small spines on their borders; proximally there are one to five transverse whorls of large spines, some of which are at least equal to one subcaudal in length. While specimens of the nominate form *papuenis papuenis* have a distinct transverse fold between the calyculate and spinose zones, an obvious homologue of the fold between the (smooth) calyces and small proximal spines seen in some other *Charlespiersonserpens* gen. nov., no such fold is evident in specimens of this subspecies.

The subspecies *lizelliottae* is further separated from *papuenis* by the greater number of maxillary teeth, 26-27 in *lizelliottae*, versus 19-23 for *papuenis*.

At the present time, the subspecies is only known from Bougainville and Woodlark Island, New Guinea.

Etymology: Named in honor of Liz Elliott, in recognition of her role as faithful wife and helper of herpetologist Adam Elliott of Hoppers Crossing, Victoria. She has spent many hours looking after reptiles while Adam has been in the field conducting research and the like.

More significantly, she has had to endure the terrorism and trauma of late night and early morning armed raids by Victorian government wildlife officers, headed by Glen Sharp and others as they have trashed the family home inhabited by herself, Adam and two very young children and also been forced to endure the undercurrent of violence that has accompanied these raids.

These officers have merely been acting on a warped sense of hatred for Adam because sometime earlier he refused to act as "informant" for them within the herpetological community.

Most specifically, this was an attempt to get him to give false information and false statements against a herpetologist who had previously blown the whistle on corruption within the same government department.

SUBGENUS *MACMILLANUS* GEN. NOV.

Type Species: *Dendrophis lorentzi* Lidth De Juede, 1911

Diagnosis: This genus includes all the snakes formerly referred to the species *Dendrophis lorentzi* Van Lidth De Juede, 1911, more recently known as *Dendrelaphis lorentzi*.

The genus includes the southern specimens still referred to the species *lorentzi* and the northern specimens from the Huon Peninsula, formerly referred to that species and herein described as a new species, namely *Charlespiersonserpens jackyhoserae* sp. nov.

Macmillanus subgen. nov. are separated from all other similar species, including all five other members of the genus *Charlespiersonserpens* gen. nov. by the following suite of characters: There is a dark stripe present along the upper edge of the lip scales, separating light labial scales from darker pigment of dorsum of head; scales of dorsum of head lack pits, average total body length of .7 to 1 metre and never exceeding 1.3 metres.; fewer than 140 subcaudals, 156-181 ventrals; 8 or 9 supralabials on each side, pale vertebral stripe is absent, a small nostril, the nasal scale is not completely divided and the nasal scute above the nostril has obvious cornification.

This subgenus is also separated from all other *Charlespiersonserpens* and *Dendrelaphis* on the basis of unique hemipenial morphology.

The hemipenis extends to subcaudal 12-15, with the major retractor muscle attaching almost, but not quite, at its tip, so that there is a short uninverted apical awn formed by the narrowed extreme tip of the organ lying distal to the attachment of the major retractor; this distal part of the organ has numerous closely packed calyces, but each calyx has numerous small spines along its border, so that the general texture of the distal end of the organ is spinose with inconspicuous longitudinal folds between the bases of the

spinules.; proximal to this spinose calyculate region there is a region of numerous spines not mounted on calyces, but each spine much less than a subcaudal in length; this spinose zone is distinctly, but not conspicuously set off from the spinose calyculate zone.

The Lesser Sunda taxon *D. inornatus* Boulenger, 1897 has a similar hemipenis, but is separated by having 15 instead of dorsal 13 mid-body rows.

Macmillanus subgen. nov. is endemic to Island New Guinea and immediately adjacent satellite islands.

Etymology: The subgenus is named in honor of Graeme Macmillan of Park Orchards, Victoria who tried with great difficulty to remove corruption from the Manningham (Melbourne) council in his role as elected councillor, as well as for his services towards financial probity in local government.

CHARLESPIERSONSERPENS (MACMILLANUS) JACKYHOSERAE SP. NOV.

Holotype: A male specimen lodged at the National Museum of Natural History, Smithsonian Institution, USNM, from Gusiko, Huon Peninsula, New Guinea.

The relevant Museum is a government owned public facility that allows researchers access to their collections and the holotype specimen is already lodged with and belongs to this facility.

Diagnosis: Separated from the species *Charlespiersonserpens lorentzi* by the following suite of characters: *Charlespiersonserpens jackyhoserae* sp. nov. has 181 ventrals versus a range of 156-173 in *Charlespiersonserpens lorentzi*; *Charlespiersonserpens lorentzi* has 8 supralabials (rarely nine on one side), versus 9 supralabials on both sides in *Charlespiersonserpens jackyhoserae* sp. nov..

Furthermore *Charlespiersonserpens jackyhoserae* sp. nov. is the only species within any *Charlespiersonserpens* or *Dendrelaphis* with the entire supraoccipital covered by the axial musculature.

Charlespiersonserpens jackyhoserae sp. nov. also differs from *Charlespiersonserpens lorentzi* in hemipenial morphology.

In this species the hemipenis extends to subcaudal 13, with longitudinal rows of small spines (each about one sixth of a subcaudal long), the rows of spines nearly to the tip and well distal to the rightward angulation of the sulcus at subcaudal 9; an apical awn, about three subcaudals long and with numerous tiny spinules; no crossfold on the organ, but lips of sulcus raised as a pair of prominent folds. The structure of the hemipenis in *Charlespiersonserpens jackyhoserae* sp. nov. shares traits with *Charlespiersonserpens lorentzi* including the black spotting on top of the head that looks like calligraphic penciling, but differs in that the apical awn is longer, being only 1-2 subcaudals in *lorentzi*.

Charlespiersonserpens jackyhoserae sp. nov. is known only from the holotype. It is therefore currently only known from the Huon Peninsula, New Guinea, but presumably also occurs in nearby parts of New Guinea north of the Central Cordillera. Until proven otherwise, the taxon, *Charlespiersonserpens lorentzi* should be regarded as confined to the region south of the Central Cordillera of island New Guinea in the general vicinity of the type locality in southern Irian Jaya in the general vicinity of the Lorentz and Mimika Rivers.

Etymology: Named in honor of my daughter Jacky Hoser who has spent the first 11 years of her life educating others about reptiles in Australia in the face of incredible adversity, including attacks from inexperienced business competitors motivated solely by a desire to extract money from people on false pretexts aided and abetted by corrupt wildlife officers who happen to be their friends. These wildlife officers and agents acting on their behalf have unlawfully assaulted and attacked Jacky both at school (on 10 August 2011) and even in her bedroom at home on 17 August 2011.

Her courage in dealing with these attacks and in continuing to educate others about reptiles with correct factual information deserves more than one great honor and recognition.

SPECIES WITHIN GENUS CHARLESPIERSONUS GEN. NOV. SUBGENERA

Charlespiersonserpens (*Charlespiersonserpens*) *punctulatus* (Gray, 1826)

Charlespiersonserpens (*Charlespiersonserpens*) *calligastra* (Günther, 1867)

Charlespiersonserpens (*Charlespiersonserpens*) *gastrosticus* (Boulenger, 1894) (1 subspecies)

Charlespiersonserpens (*Charlespiersonserpens*) *salomonis* (Günther, 1872)

Charlespiersonserpens (*Downieea*) *papuensis* (Boulenger, 1895) (1 subspecies)

Charlespiersonserpens (*Macmillanus*) *jackyhoserae* sp. nov.

Charlespiersonserpens (*Macmillanus*) *lorentzi* (Lidth De Jeude, 1911)

SPECIES REMAINING WITHIN THE GENUS DENDRELAPHIS BOULENGER, 1890

Dendrelaphis andamanensis (Anderson, 1871)

Dendrelaphis ashoki Vogel and Van Rooijen, 2011

Dendrelaphis bifrenalis (Boulenger, 1890)

Dendrelaphis biloreatus Wall, 1908

Dendrelaphis caudolineatus (Gray, 1834)

Dendrelaphis caudolineolatus (Günther, 1869)

Dendrelaphis chairecaeos (Boie, 1827)

Dendrelaphis cyanochloris (Wall, 1921)

Dendrelaphis formosus (Boie, 1827)

Dendrelaphis giri Vogel and Van Rooijen, 2011

Dendrelaphis grandoculis (Boulenger, 1890)

Dendrelaphis grismeri Vogel and Van Rooijen, 2008

Dendrelaphis hollinrakei Lazell, 2002

Dendrelaphis humayuni Tiwari and Biswas, 1973

Dendrelaphis inornatus Boulenger, 1897

Dendrelaphis kopsteini Vogel and Van Rooijen, 2007

Dendrelaphis marenae Vogel and Van Rooijen, 2008

Dendrelaphis ngansonensis (Bourett, 1935)

Dendrelaphis oliveri (Taylor, 1950)

Dendrelaphis pictus (Gmelin, 1789)

Dendrelaphis schokari (Kuhl, 1820)

Dendrelaphis striatus (Cohn, 1905)

Dendrelaphis subocularis (Boulenger, 1888)

Dendrelaphis tristis (Daudin, 1803)

Dendrelaphis underwoodi Vogel and Van Rooijen, 2011

Dendrelaphis walli Vogel and Van Rooijen, 2011

GENUS BOIGA FITZINGER, 1826 SENSO LATO

This is a clearly composite genus in urgent need of major taxonomic review.

This paper continues the somewhat piecemeal review process of the genus, most recently commenced by herpetologists such as Meirte (1992), who have recently removed African species from the genus.

Meirte (1992), resurrected the genus *Toxicodryas* Hallowell, 1857 for the two African species previously assigned to the genus *Boiga*.

This move was rejected by Broadley (1998), a position that was supported by others including Hughes (2000).

However the placement of the two African species in the genus *Toxicodryas* has more recently in effect been supported by the very limited molecular data provided by Pyron et. al. in 2011.

Their results only showed data for two species within *Boiga senso lato*, including what they called *Boiga pulverulenta* and the well-known Asiatic species *B. dendrophila*.

While these results showed the two species to be related, the division between the two was more than ample to warrant the splitting of the species between two genera when compared to other species tested within and between related genera.

While *B. dendrophila* is not the type species of the genus *Boiga*, it is safe to infer a similar result would have been obtained by Pyron et. al. if they had tested *Boiga irregularis* against African *Boiga pulverulenta*.

What has not yet been determined by molecular means is the differences between the Asiatic and Australian species groups within *Boiga* or for that matter differences between the various Asiatic groups.

It's worth noting that what's left of *Boiga* after the two *Toxicodryas* are removed is still a very paraphyletic group of common origin with a distribution ranging through most of Asia, from eastern Iran, across Indonesia and into north and east Australia. These species range from large moderately built species, to very thin and sometimes much smaller animals.

In terms of morphology and habits, the species are diverse and often sympatric, with different taxa occupying different habitats and ecological positions, even though all are similar in obvious key respects such as their large eyes, laterally compressed bodies and so on.

The taxonomic position is made even less clear by the fact that while there are about 30 recognized species and another 15 or so subspecies, these numbers do not give an accurate reflection of the true composition of the genus.

Instead the current composition of the genus in many ways reflects collection localities and interpretations of morphological variants by different herpetologists.

Therefore I should note that the current content compositions (total numbers) of the two newly named genera as well as the remaining *Boiga* beyond those listed within each, should be treated as provisional on the basis of further taxa likely to be described and/or added to given genera.

Coluber irregularis Bechstein, 1802, now widely known as *Boiga irregularis* is the type species of the genus *Boiga* Fitzinger. The name *Ibiba* Gray, 1825, as suppressed under the plenary powers in ICZN Opinion 1374, has been placed on the Official Index of Rejected and Invalid Generic Names in Zoology.

Genus *Dipsadomorphus* Fitzinger, 1843 appears to be a valid name for the type species *Coluber trigonatus* Schneider, 1802, now known widely as *Boiga trigonatus*.

To a greater degree than others within the genus *Boiga* as presently understood, this taxon is divergent in being more terrestrial in habit and invades habitats not used by other *Boiga*, as well as being somewhat smaller in average size than many other members, including the type species for *Boiga*, namely *B. irregularis*.

It is my view that this taxon should be placed within the genus *Dipsadomorphus*.

Other taxa within *Boiga*, are also likely to be better placed in *Dipsadomorphus* instead of *Boiga* but this potential move is deferred for the time being.

Noting the situation in terms of the rest of *Boiga*, the obvious divergent groups within the genus as currently understood and the current lack of molecular data on the genus, I have herein only removed the most obviously morphologically and ecologically divergent members of *Boiga* from the genus.

I note however that further division of the genus, at least to subgenus and species groups is almost inevitable when firm molecular data is obtained for all species.

Many of the south-east Asian species have little in common with the type species *Boiga irregularis* or the type for *Dipsadomorphus* and to complicate matters further there remain several undescribed forms in Indonesia and probably

elsewhere.

Within this paper I hereby create two new genera in which to place members of *Boiga* that are clearly divergent from both the *Dipsadomorphus* Fitzinger, 1843 type species and the species *Boiga irregularis*.

The species *Boiga dendrophila* is placed in a monotypic genus *Dorisius* gen. nov..

The highly divergent so-called *Boiga drapiezii* group, including species both described and undescribed are placed in the genus *Mulvanyus* gen. nov..

While the genus *Boiga senso lato* remains one of the less understood groups of common snakes, there are a number of relevant publications in terms of the genus and particular species. With more than 30 species taxa formally named it isn't practical for to cite all the noteworthy literature, however some of the more important relevant published studies and records include, Acala (1986), Ahl (1933), Auliya (2006), Bauer and Günther (1992), Brongersma (1934), Bulian (2000), Cox et. al. (1998), Das (1999), David and Vogel (1996), de Lang and Vogel (2005), Duméril, Bibron and Duméril (1854), Even (2009), Ferner et. al. (2000), Gaulke (1994), Gaulke et. al. (2003), Geissler et. al. (2011), Greene (1989), Groen (2006, 2008), Günther (1863), Khan (1988, 2002), Kramer (1977), Leong et. al. (2009), Leviton (1968), Longman (1915, 1918), Macleay (1877, 1884, 1888), Manamendra-Arachchi and Pethiyagoda (2007), Manthey and Grossmann (1997), McCoy (2006), Mertens (1961), Minton and Dunson (1978), Neier (1981), Nguyen et. al. (2009), Orlov and Ryabov (2002), Orlov, et. al. (2003), Pauwels and Vogel (2011), Pauwels et. al. (2005), Ramadhan et. al. (2010), Rodda and Fritts (1992), Schmidt (2012), Smith (1943), Taylor (1923), Taylor (1965), Tillack et. al. (2004), van Rooijen and van Rooijen (2004), Vogel (2000), Wall (1908c, 1909, 1921), Wen (1998), Werner (1899a, 1899b) and Zhao and Adler (1993).

GENUS *BOIGA* FITZINGER, 1826

Diagnosis: As currently understood this is a composite group of snakes.

They are venomous rear fanged generally arboreal "Tree Snakes" or climbing species characterized by a broad head and large often bulbous eyes with a vertically elliptical pupil.

There are solid teeth on both jaws, the prefrontal is in contact with the nasal, the tail is more-or-less cylindrical and pointed, 19-25 mid-body rows, smooth dorsal scales, ventral scales run fully across the belly, the nostrils are usually lateral and the head is covered with large symmetrical shields, undivided anal, divided subcaudals and a loreal on each side of the head.

These snakes are long and thin in build and have a laterally compressed body, the degree of these traits varying on the species.

All are oviparous.

Distribution: The genus ranges through most of southern Asia, from eastern Iran, across Indonesia and into north and east Australia.

GENUS *DORISIOUS* GEN. NOV.

Type species: *Dipsas dendrophila* Boie, 1827.

(Known in most contemporary texts as *Boiga dendrophila*)

Diagnosis: Separated from all other snakes in the genus *Boiga* by the following suite of characters: While it is a relatively long thin snake with a laterally compressed body, sharp vertebral ridge and enlarged head, the snake is more stout and heavily bodied than most other *Boiga* and so is a heavier animal at a given length. In line with the relatively stout build is a lower ventral count of 209-239 ventrals versus 240 or more for other *Boiga* species (and *Mulvanyus* gen. nov.).

In *Dorisius* gen. nov. there are 78-110, subcaudals versus over 112 for *Boiga* species (and *Mulvanyus* gen. nov.).

These snakes are unmistakable by their black body with thin,

incomplete yellow bands, being orangeish on juveniles, the head is black, supralabials yellow with black etching.

The snake attains a maximum total length of about 2.5 metres.

In line with other *Boiga*, the snake retains large eyes, smooth dorsal scales, single anal, all divided subcaudals and has an enlarged vertebral row of scales.

This genus is presently monotypic for the species *Boiga dendrophila* including recognized subspecies, however some of the currently recognized subspecies may ultimately prove to be full species.

Distribution: Found in southern Thailand through peninsula Malaysia to Singapore and Sumatra, as well as the Philippines, Natuna Archipelago, Borneo, Java and Sulawesi.

Common name: Mangrove Snake, in reference to its preferred habitat, namely mangrove swamps.

Etymology: Named in honor of Morrie Dorisio, of Bulleen, Victoria, Australia for many to date unrecognized services to herpetology. Of relevance to reptile keepers in Australia and elsewhere, is that in February 1994, after all my computer equipment and files were taken and destroyed by corrupt Victorian police trying to stop the publication of what was ultimately three books about Victorian Police Corruption (Hoser 1995, Hoser 1999a, Hoser 1999b), Morrie Dorisio came to the rescue and spent countless days and hours teaching me how to use more modern computers to enable these books and more importantly another book, *Smuggled-2: Wildlife Trafficking, Crime and Corruption in Australia*, (Hoser 1996) to be published.

Without Morrie's efforts, for which he never sought or got any reward, that 1996 book would never have been published.

It was only as a result of the sequence of events arising from the publication of that book which caused the laws in Australia get changed by governments in Australia to allow private citizens in most parts of Australia to be allowed to keep reptiles as pets for the first time in over 20 years.

As this journal goes to print, those rights are under threat yet again and as I am now over 50 years old, I will probably not be able spend another 20 years fighting a ban on private reptile ownership if and when one is re-imposed in Australia.

All herpetologists in Australia owe Morrie Dorisio a debt in gratitude and it is fitting that he should be honored with a genus of snakes named after him.

One hopes that "new generation" reptile keepers in Australia think of Morrie in particular every time they handle the pet snake that his good work allowed them to keep without fear of a dawn raid and jail!

GENUS *MULVANYUS* GEN. NOV.

Type species: *Dipsas drapiezii* Boie, 1827

(Known in most contemporary texts as *Boiga drapiezii*)

Diagnosis: These are a long vine-like snake with strongly laterally compressed body shape vertebral ridge, large head shields and vertical pupils.

Mulvanyus gen. nov. are separated from snakes of the genus *Boiga* and *Mulvanyus* gen. nov. by their greatly enlarged and blunt triangular head (distinctly blunt snout) as well as their unusually large and bulbous eyes (even when compared to other *Boiga* species).

There are 19 smooth dorsal mid-body scale rows, 250-285 ventrals, 114-168 divided subcaudals, and a single anal. The body comes in various colors depending on locality and species.

Most specimens are reddish or brownish with some sort of transverse bands not contacting the ventrals often with irregularly shaped white ventrolateral blotches occurring along the length of the body and tail, and with a brownish head.

Distribution: From southern Thailand, south and east through Indonesia through Sumatra, Java and Borneo and possibly

islands further east as well as the Philippines.

Etymology: Named in honor of Paul Mulvany of Blackburn, Victoria, Australia. He is the unseen handyman who kept all the Snakebusters cages in tip-top shape and our reptiles in immaculate health over many years.

He deserves recognition for his generally unpaid efforts towards improving the welfare of our captive reptiles used for the invaluable public education of millions of Australians.

CONTENT OF GENUS *MULVANYUS* GEN. NOV.

Mulvanyus drapiezii (Boie, 1827) (Type species)

Mulvanyus angulata (Peters, 1861)

Mulvanyus philippina (Peters, 1867)

Mulvanyus schultzei (Taylor, 1923)

SPECIES REMAINING WITHIN *BOIGA*

Boiga andamanensis (Wall, 1909)

Boiga barnesii (Günther, 1869)

Boiga beddomei (Wall, 1909)

Boiga bengkulensis Orlov, Kudryavtzev, Ryabov and Shumakov, 2003

Boiga bourreti Tillack, Ziegler and Khac Quyet, 2004

Boiga ceylonensis (Günther, 1858)

Boiga cyanea (Duméril, Bibron and Duméril, 1854)

Boiga cynodon (Boie, 1827)

Boiga dightoni (Boulenger, 1894)

Boiga forsteni (Duméril, Bibron and Duméril, 1854)

Boiga gokool (Gray, 1835)

Boiga guangxiensis Wen, 1998

Boiga hoeseli Ramadhan, Iskandar and Subasri, 2010

Boiga irregularis (Bechstein, 1802)

Boiga jaspidea (Duméril, Bibron and Duméril, 1854)

Boiga kraepelini Stejneger, 1902

Boiga multifasciata (Blyth, 1861)

Boiga multomaculata (Boie, 1827)

Boiga nigriceps (Günther, 1863)

Boiga nuchalis (Günther, 1875)

Boiga ochracea (Günther, 1868)

Boiga quincunciata (Wall, 1908)

Boiga saengsomii Nutaphand, 1985

Boiga schultzei Taylor, 1923

Boiga siamensis Nutaphand, 1971

Boiga tanahjampeana Orlov and Ryabov, 2002

Boiga trigonata (Schneider, 1802)

Boiga wallachi Das, 1998

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