

A review of Natricine genera *Tropidonophis* Jan, 1863 and *Amphiesma* Duméril, Bibron and Duméril, 1854 (Serpentes:Colubroidae:Natricinae).

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ABSTRACT

The taxonomy of the Natricine genera *Tropidonophis* Jan, 1863 and *Amphiesma* Duméril, Bibron and Duméril, 1854 is reassessed on the basis of all available information.

As a result the genus *Tropidonophis* as known is divided into two and there are a number of taxonomic acts made according to the Zoological Code.

The two Philippine species are placed within a newly named genus *Oxynatrix* gen. nov.. It is in turn divided into subgenera to accommodate each taxon.

The remainder of *Tropidonophis* is divided into four subgenera, including the nominate one retaining most species, *Stypohynchus* Peters, 1863 for *Tropidonophis truncatus* (Peters, 1863) with four similar species and two monotypic subgenera for the species *Tropidonophis doriae* (Boulenger, 1897) and *Tropidonophis elongatus* (Jan, 1865).

Tropidonophis elongatus (Jan, 1865), is divided into three species, and one of the newly named species is in turn divided into two subspecies.

The three New Guinea species *Tropidonophis multiscutellatus* (Brongersma, 1948), *Tropidonophis novaeguineae* (Lidth De Jude, 1911) and *Tropidonophis picturatus* (Schlegel, 1837) are each divided into two subspecies.

Amphiesma is reviewed and found to be paraphyletic. Available names are found for some species groups, but five groups lacking an available name are formally assigned to newly named genera and a single species to a newly named subgenus. These are *Greernatrix* gen. nov., *Wellsnatrix* gen. nov., *Wellingtonnatrix* gen. nov., *Elliottnatrix* gen. nov., *Asianatrix* gen. nov. and *Sundanatrix* subgen. nov. respectively.

Keywords: Taxonomic revision; new genera; new subgenera; new species; new subspecies; *Tropidonophis*; *Amphiesma*; *Oxynatrix*; *Kirnerea*; *Desburkeus*; *Desburkei*; *Alanbrygelus*; *alanbrygeli*; *smythi*; *sammywatsonae*; *cottoni*; *trioanoi*; *pillotti*; *Greernatrix*; *Wellsnatrix*; *Wellingtonnatrix*; *Elliottnatrix*; *Asianatrix*; *Sundanatrix*.

INTRODUCTION (*TROPIDONOPHIS*)

The genus *Tropidonophis* Jan, 1863 was for many years synonymised with *Amphiesma* Duméril, Bibron and Duméril, 1854. However as a result of monographs by Malnate in 1960 and 1962 and another with Underwood in 1988 formally defining both genera, most publishing herpetologists have adopted their classification without question.

Due in large part to the comprehensive detail in which the authors investigated these snakes and then published their results, the morphologically conservative water snakes from the Australasian region, genus *Tropidonophis* have since attracted little taxonomic interest.

While there had been several attempts to erect new genera for snakes within both genera in the 1800's, (generally rejected), no

new generic names have been proposed for species groups within each genus in recent years.

Notwithstanding this, recent phylogenetic studies by Pyron et. al. (2011) and Guo et. al. (2012) have shown the various morphologically conservative snakes in the Natricine genera to have deep rooted phylogenetic divisions.

Characters thought to be of little importance, have been shown to indicate major historical divergences between species.

As a result of a revisiting of the molecular and morphological data, several Natracine genera have been further divided, including: *Regina* and *Nerodia* (Hoser 2012b), *Natrix* (Hoser 2012c) and *Xenenchrophis* (Hoser 2012d) as well as other snake genera in the same region (e.g. Hoser 2012e).

I should note herein that claims circulated via SPAM e-mail by a little-known morbidly obese academic by the name of Hinrich Kaiser (Kaiser 2012) on 5 June 2012 alleging that the preceding papers made taxonomic judgments without evidence are false.

The same applies to all other claims adverse to myself within that publication. Most claims were systematically disproven by Hoser (2012) so it is scandalous that discredited allegations are being reshaped by an alleged academic.

In the context of snake species groups straddling the boundaries of the Asian and Australian regions, studies have consistently highlighted the ancient divisions between morphologically similar reptiles that have sometimes crossed the divide.

Rawlings et. al. (2008) confirmed that in pythons at least, minor morphological differences can conceal major differences in terms of common ancestry between species.

At a local level, DNA evidence provided by Harvey et. al. (2000), Rawlings and Donnellan (2003) and Schleip (2008) showed quite clearly that phenotypically similar species from either side of the New Guinea cordillera have been unable to breach the barrier in recent geological times and therefore evolved as separate species units.

In the case of Rawlings and Donnellan (2003), they were even unable to phenotypically separate what their molecular evidence confirmed were two well-separated species of Green Python (Genus *Chondropython*).

All three studies followed from Hoser (1998) which relying solely on morphological evidence divided species of Death Adder in New Guinea (*Acanthophis*) broadly in line with major geographical barriers, with species divisions in the same geographical regions.

In terms of island New Guinea, similar splits were demonstrated by McDowell in 1975 and 1984 in terms of various snake species as then defined, some of which have since been divided at the species level (Hoser 2012e).

Continuing the process of reassessing snake species within the New Guinea region, the most recent classification of the genus *Tropidonophis* Jan, 1863 has been revisited.

Effectively unchanged since 1988, the only taxonomic change for the *Tropidonophis* species group since 1988 has been the description of the morphologically divergent New Guinea species *T. dolasii* by Kraus and Allison in 2004.

While Malnate and Underwood (1988) accurately identified differences between their identified taxa (including the description of new species and subspecies), they chose not to take any actions in relation to several species (or species groups) that occurred across broad geographical areas and over known biological barriers.

This was in spite of their ability to document substantive differences between what are known to be morphologically conservative snakes.

Revisiting their data and the limited amount of new material published since, it is clear that the authors overlooked what were clearly well-identified species and/or subspecies.

In terms of the various groups of species within the genus *Tropidonophis* as they defined it, the authors failed to formally group them.

The two Philippines species are widely divergent of the others in the genus *Tropidonophis* with Malnate and Underwood even discussing the relative merits of whether or not to include them in the genus.

Revisiting their data, I have formed the view that these two species should not be in the genus *Tropidonophis* at all.

Because there is no available name for the species group, a new genus *Oxynatrix* gen. nov. is named and defined according to the Zoological Code (Ride et. al. 1999).

The two allopatric species within the Philippines are themselves sufficiently divergent to be placed in subgenera, which are formally named and defined, the second subgenus being *Kirneria* subgen. nov., the nominate subgenus being effectively defined by default.

In terms of the remainder of the genus *Tropidonophis*, there seems little doubt that when molecular studies are done, deep divisions will be found between species groups warranting the erection of new genera, as I am sure will also occur for the Asian genus *Amphiesma*, which is why new genera are erected in terms of that group of snakes below.

Taking a conservative position, I herein place the relevant species groups within *Tropidonophis* within subgenera.

The nominate subgenus is the one retaining most species.

The name *Styphynchus* Peters, 1863 is used to accommodate the type species *Tropidonophis truncatus* (Peters, 1863) with four similar species.

Two monotypic subgenera are erected, namely *Desburkeus* subgen. nov. for the species *Tropidonophis doriae* (Boulenger, 1897), and *Alanbrygelus* subgen. nov. for *Tropidonophis elongatus* (Jan, 1865).

At the species level, the relative differences between taxa as identified are reassessed and divisions are made along similar lines as done for other snake taxa in the New Guinea region.

While the divisions have been made herein solely on the basis of morphological characteristics, it should be noted that they consistently match the positions of major known geographical barriers.

Such barriers include the central cordillera of Island New Guinea, major habitat biomes and oceanic water bodies.

As a result of this reassessment of available information, *Tropidonophis doriae* (Boulenger, 1897), is divided into two subspecies, the second one named *T. doriae desburkei* subsp. nov..

Tropidonophis elongatus (Jan, 1865), is divided into three species, the two new ones named *T. smythi* sp. nov. and *T. brygeli* sp. nov.. In turn *T. brygeli* sp. nov. is divided into two subspecies, being the nominate form, *T. brygeli brygeli* subsp. nov. and *T. brygeli sammywatsonae* subsp. nov.

Three other New Guinea species are also divided on the basis of obvious consistent morphological differences.

In the first instance, I have taken the most conservative position and merely classified the divergent forms as subspecies as opposed to full species.

The species divided herein are; *Tropidonophis multiscutellatus* (Brongersma, 1948) with a new subspecies *T. m. cottoni* subsp. nov., *Tropidonophis novaeguineae* (Lidth De Jude, 1911) with new subspecies *T. n. trioanoi* subsp. nov. and *Tropidonophis picturatus* (Schlegel, 1837) with new subspecies *T. p. pillotti* subsp. nov..

The purpose of this paper is not to redefine the minute detail of all the taxa within the genera *Tropidonophis* and *Amphiesma*. This is more than adequately done by Malnate and Underwood 1988 and Malnate (1960, 1962) and Ota and Iwanaga (1997) and the definitions within those papers are relied upon for the purposes of this.

Furthermore these monographs are freely available on the internet for anyone interested in the detail.

Other important publications in terms of the snakes of the genus *Tropidonophis* include the following; Boettger (1895), Boulenger (1893, 1895, 1896, 1897), Brongersma (1948), Cogger and Lindner (1974), Daan and Hillenius (1966), De Haas (1950), De Jong (1927), de Rooij (1917), Duméril et. al. (1854), Ferner et. al. (2000), Gaulke (2001), Gray (1841), Günther (1877, 1893), Hediger (1934), Hoser (1989), How and Kitchner (1997), Jan (1863, 1865), Jan and Sordelli (1868), Kraus and Allison (2004), Laurent (1948), Lidth de Juede (1897, 1911a, 1911b), Loveridge (1948), Macleay (1877, 1884, 1885), Peters and Doria (1878), Perters and Hartwig (1863), Read (1998), Schlegel (1837), Shea (1990), Smith (1993), Sternfeld (1913), Taylor (1917), Werner (1899, 1900, 1925) and Worrell (1946).

In terms of the descriptions immediately below, the most divergent Philippine taxa are dealt with first, by formal removal from the genus *Tropidonophis*, including definitions of subgenera. This is followed by the diagnoses of subgenera within *Tropidonophis* as well as diagnoses of new taxa within these groups.

Pre-existing named subgenera within *Tropidonophis* are not defined herein, however component species are listed. Those for which subspecies are described are defined in terms of the formal descriptions of the subspecies in order to comply with the Zoological Code (Ride et. al. 1999).

Amphiesma is dealt with below the descriptions for the new taxa within *Tropidonophis* *senso lato*.

GENUS OXYNATRIX GEN. NOV.

Type species: *Natrix dendrophiops negrosensis* Taylor, 1917

Diagnosis: *Oxyntatrix* gen. nov. are separated from all *Tropidonophis* by one or other character combinations: Two preocular scales, 19 mid-body scale rows and a pattern of dorsolateral light stripes (species *negrosensis*) or alternatively if without dorsolateral stripes, may have one or two pre-oculars, has 17 mid body scale rows for all or most of the body length and 9-10 infralabials (species *dendrophiops*).

All other *Tropidonophis* (as defined herein) lack these character combinations.

Oxyntatrix gen. nov. are further separated from all *Tropidonophis* by a different hemipen morphology. In this genus (*Oxyntatrix* gen. nov.) the hemipenis for both species has small irregular tabs of tissue scattered among the small spines present, which is a trait not seen in *Tropidonophis* (as defined herein).

Detailed descriptions of both species within this genus (which could also be used to define the genus in total if desired, can be found in Malnate and Underwood (1968).

Distribution: A genus confined to the Philippines

Etymology: Named in honor of my eight year old dog, Great Dane, "Oxyranus" or "Oxy" for short. In that time he protected the Snakebusters reptiles from numerous theft attempts in a way that only a loyal dog could do.

The Snakebusters reptiles gave millions of Victorians an opportunity they would otherwise never have had to learn about reptiles in hands-on education, where they were allowed to hold reptiles and where they got accurate factual information and education, rather than the lies, misinformation and half-truths available from alternative sources who teach people to demonize reptiles and to have an unrealistic fear of even the most innocuous species.

PS *Oxuranus* is a genus name for an Australasian elapid snake.

Content of genus *Oxyntatrix* gen. nov.

Oxyntatrix negrosensis (Taylor, 1917) (Type species).

Oxyntatrix dendrophiops (Günther, 1883).

SUBGENUS KIRNEREA GEN. NOV.

Type species: *Tropidonotus dendrophiops* Günther, 1883

Diagnosis: *Kirnerea* is separated from other *Oxyntatrix* gen. nov. by the following character combination; It is without dorsolateral stripes, may have one or two pre-oculars, has 17 mid body scale

rows for all or most of the body length and 9 or 10 infralabials (species *dendrophiops*). In the subgenus *Oxyntatrix* gen. nov. snakes are distinguished by the following character state: Two preocular scales, 19 mid-body scale rows and a pattern of dorsolateral light stripes.

Kirnerea subgen. nov. is monotypic for the type species *dendrophiops*.

All other *Tropidonophis* (as defined herein) lack these character combinations.

Kirnerea subgen. nov. and *Oxyntatrix* subgen. nov. as defined herein can also be separated by the following: 1/ the reduction of dorsal scale rows to 17 occurs posterior to the midbody level in *Oxyntatrix* subgen. nov. but on the neck in *Kirnerea* subgen. nov. 2/ the sum of the ventrals and the subcaudals is greater in *Oxyntatrix* subgen. nov. (average 256.9 in males, 252.7 females, versus 252.8 in males and 239.3 in females in *Kirnerea* subgen. nov.) 3/ the supralabial apex is the penultimate scale of the series on *Oxyntatrix* subgen. nov. and the ultimate on *Kirnerea* subgen. nov. 4/ A single preocular is common in *Oxyntatrix* subgen. nov. versus usually divided (up to three) in *Kirnerea* subgen. nov. 5/ the number of maxillary teeth is lower in *Oxyntatrix* subgen. nov. 6/ there are fewer palatine teeth and more pterygoid teeth in *Oxyntatrix* subgen. nov. 7/ The retractor muscle of the hemipenis is longer in *Oxyntatrix* subgen. nov.

Detailed descriptions of each species within this genus (which could also be used to define the genus in total) can be found in Malnate and Underwood (1968).

Kirnerea subgen. nov. is monotypic for the type species *dendrophiops*.

Oxyntatrix subgen. nov. is monotypic for the species *negrosensis* and is the only species within the genera *Oxyntatrix* gen. nov. or *Tropidonophis* to have 19 mid-body scale rows.

Distribution: The Philippines. This subgenus has an allopatric distribution to the subgenus *Oxyntatrix* gen. nov.. *Kirnerea* subgen. nov. is found specifically on the southern and central Philippines islands of Leyte, Camiguin, Mindanao, Bohol and Basilan.

Etymology: Named in honor of Christine Kirner, in recent decades in Melbourne, Australia, for various assistances in terms of Snakebusters reptile shows and education, in turn assisting wildlife conservation in Australia.

SUBGENUS OXYNATRIX SUBGEN. NOV.

Type species: *Natrix dendrophiops negrosensis* Taylor, 1917

Diagnosis: As for the genus and by exclusion of the subgenus *Kirnerea* as defined above.

Kirnerea is separated from other *Oxyntatrix* gen. nov. by the following character combination; It is without dorsolateral stripes, may have one or two pre-oculars, has 17 mid body scale rows for all or most of the body length and 9 or 10 infralabials (species *dendrophiops*). In the subgenus *Oxyntatrix* gen. nov. snakes are distinguished by the following character state: Two preocular scales, 19 mid-body scale rows and a pattern of dorsolateral light stripes.

Kirnerea subgen. nov. and *Oxyntatrix* subgen. nov. as defined herein can also be separated by the following: 1/ the reduction of dorsal scale rows to 17 occurs posterior to the midbody level in *Oxyntatrix* subgen. nov. but on the neck in *Kirnerea* subgen. nov. 2/ the sum of the ventrals and the subcaudals is greater in *Oxyntatrix* subgen. nov. (average 256.9 in males, 252.7 females, versus 252.8 in males and 239.3 in females in *Kirnerea* subgen. nov.) 3/ the supralabial apex is the penultimate scale of the series on *Oxyntatrix* subgen. nov. and the ultimate on *Kirnerea* subgen. nov. 4/ A single preocular is common in *Oxyntatrix* subgen. nov. versus usually divided (up to three) in *Kirnerea* subgen. nov. 5/ the number of maxillary teeth is lower in *Oxyntatrix* subgen. nov. 6/ there are fewer palatine teeth and more pterygoid teeth in *Oxyntatrix* subgen. nov. 7/ The retractor muscle of the hemipenis is longer in *Oxyntatrix* subgen. nov.

Detailed descriptions of each species within this genus (which could also be used to define the genus in total) can be found in Malnate and Underwood (1968).

Kirnerea subgen. nov. is monotypic for the type species *dendrophlops*.

Oxynatrix subgen. nov. is monotypic for the species *negrosensis* and is the only species within the genera *Oxynatrix* gen. nov. or *Tropidonophis* to have 19 mid-body scale rows.

Distribution: Recorded by Malnate and Underwood (1968) as occurring on the central Philippines islands of Mindoro, Masbate, Panay, Sicogen, Pan de Azucar, Negros and Cebu. This subgenus has an allopatric distribution to the subgenus *Kirnerea* subgen. nov.

Etymology: See for the genus above.

GENUS *TROPIDONOPHIS* JAN, 1863

Type species: *Tropidonotus picturatus* Schlegel, 1837

Diagnosis: As currently recognized this is one of a number of Natricine genera from the south-east Asian region. It is a solid toothed non-venomous genus of snakes with strongly keeled scales on the body with 15 dorsal mid-body rows and without reduction on the neck or posterior trunk (the exceptional taxon is removed from this genus herein), most subcaudals have a single pit on the outer posterior edge, starting from the first subcaudal and reducing in size and prominence as one moves posteriorly.

All snakes possess a loreal scale.

According to Malnate (1968), *Tropidonophis* species are assigned when they have at least three of the following characters: 1/ pits in more than 10 per cent of the subcaudals, 2/ A uniform number of scale rows on the trunk, 3/ reduction of the number of caudal scale rows to four occurs posterior to the midnumber of subcaudals and the greatest length of the scale row sets is that of six rows, 4/ a subchoanal process on the palatine bone.

In none of the other Natracine genera is more than one of the four previous characters present in any species, (this obviously now not being the case for the two Philippine species herein removed from the genus and placed in a new genus in this paper).

Like *Amphiesma*, these species are most common near water.

Distribution: Australasia with the centre of distribution in New Guinea. Species occur in south-east Asia.

The two species from the Philippines formerly referred to this genus are herein placed in a new genus (see above).

SUBGENUS *DESBURKEUS* SUBGEN. NOV.

Type species: *Tropidonotus doriae* Boulenger, 1897.

Diagnosis: This subgenus is monotypic for the species *doriae*. Hence this diagnosis applies to this species as well as the subgenus.

Desburkeus subgen. nov. is easily separated from all other *Tropidonophis* by having 17 dorsal mid-body scale rows and just 8 supralabials with the third and fourth in contact with the eye. The other species within the genus *Tropidonophis* that have 17 dorsal mid-body scale rows have 9 supralabials with numbers 5 and 6 in contact with the eye.

Distribution: Known only from most regions on island New Guinea and the Aru Islands, south of New Guinea.

Etymology: *Desburkeus* is named in honor of Des Burke of Melbourne, Victoria, Australia as detailed in the book *The Hoser Files: The Fight Against Entrenched Official Corruption* (Hoser 1995). His crime was being a part-time taxi driver and being in the wrong place at the wrong time.

After giving evidence on behalf of corruption whistleblowers against corrupt Victorian Police and Vicroads officers, his life was totally trashed and destroyed by them.

The disgusting and hateful actions by the Victoria Police and Vicroads officers attacked Burke in ways only limited by their

imagination. They harassed his employer to sack him, then they harassed and attacked his wife and young children, costing him his marriage and happy well-off suburban lifestyle.

Finally in their warped and perverse sense of evil and hatred, they took pride in finally making him homeless and destitute on the cold streets of Melbourne.

While many reptiles have been named in honor of despots and dictators and the thugs that work under them, few if any have been named in honor of victims of these crimes who have been left poor and homeless as a result.

TROPIDONOPHIS (DESBURKEUS) DORIAE (BOULENGER, 1897)

Diagnosis: This species is easily separated from all other *Tropidonophis* by having 17 dorsal mid-body scale rows and just 8 supralabials with the third and fourth in contact with the eye. The other species within the genus *Tropidonophis* that have 17 dorsal mid-body scale rows have 9 supralabials with numbers 5 and 6 in contact with the eye.

This taxon is further diagnosed by the presence of 137-159 ventrals in males and 134-153 ventrals in females, 74-90 subcaudals in males and 71-86 subcaudals in females; 1-3 (usually 2) preoculars, 2-4 (usually 3) postoculars, 1-4 (usually 2) anterior temporals and 2-5 (usually 2) posterior temporals.

Distribution: Known only from most regions on island New Guinea and the Aru Islands, south of island New Guinea.

TROPIDONOPHIS (DESBURKEUS) DORIAE DESBURKEI SUBSP. NOV.

Holotype: A specimen in the Zoologisches Museum Berlin (ZMB), from Seltutti, Kobroor, the Aru Islands, Indonesia, specimen number NMB 6226.

The Zoologisches Museum Berlin is a government owned facility that allows researchers access to their collection.

Paratype: A specimen from Seltutti, Kobroor, the Aru Islands, Indonesia, specimen number SMF 17192 in the Senckenbergische Museum, Frankfurt, Germany.

The Senckenbergische Museum, Frankfurt, Germany is a government owned facility that allows researchers access to their collection.

Diagnosis: The subspecies *desburkei* subsp. nov. is separated from the nominal form by higher ventral count in both sexes. On Aru Island, this is outside the range reported for the species anywhere else, being 158 in males (versus less than 155 everywhere else) and 152 in females versus up to 152 everywhere else, the higher counts being found in a region encompassing southern Irian Jaya and nearby areas.

Specimens from southern Irian Jaya and the adjacent parts of New Guinea Western Province, while not reporting scale counts as high as for Aru Island specimens are also referred to this subspecies due to their higher average ventral counts and other features in common including color and morphology.

Specimens from south-east New Guinea and north of the main central cordillera are referred to the nominal form.

The subspecies *desburkei* subsp. nov. as defined herein (including both Aru Islands and southwest island New Guinea specimens) is separated from the nominate form by the following suite of characters, a consistently higher subcaudal count (80-90, versus 74-79 in males and 79-86 in females versus 71-84), higher ventral count (152-159 versus 137-151 in males and 79-86 versus 74-79 in females) and higher ventral plus subcaudal counts.

desburkei subsp. nov. is further separated from the nominal form by having weak to distinct dorsal scale pits versus indistinct to absent in the nominal race.

desburkei subsp. nov. has 29-32 maxillary teeth, versus 23-30 in the nominal form.

The nominate form has prominent bands or spots (usually bands) whereas such markings are either absent or very

indistinct in *desburkei* subsp. nov..

The venter in *desburkei* subsp. nov. is sometimes immaculate, which is not seen in the nominate race.

The hemipenes of the nominal race differs in being longer and the enlarged basal spine is followed distally by a group of stout spines rather than a large spine as seen in *desburkei* subsp. nov..

Etymology: As for the subgenus.

SUBGENUS ALANBRYGELUS SUBGEN. NOV.

Type species: *Tropidonotus picturatus* var. *elongatus* Jan, 1863.

Known in most contemporary texts as *Tropidonophis elongatus*.

Diagnosis: Separated from all other *Tropidonophis* by the following suite of characters: 15 dorsal mid-body rows, 3 posterior temporals, rarely 2, 4 or more and 155-175 ventrals, 85-108 subcaudals.

Other features include, 8 (rarely 7 or 9) postoculars, 10 supralabials, with numbers, 3-5 or 4-6 in contact with the eye, 9-10 (rarely 8) infralabials, 2 (rarely 1, 3, 4 or 5) anterior temporals, 2-3, rarely 1, 4 or 5 posterior temporals.

This subgenus refers to all snakes previously recognized as the species taxon *Tropidonophis elongatus*.

As noted by the species name, this group of snakes are a relatively elongate form of *Tropidonophis*, reflected by their consistently higher ventral and subcaudal counts.

Distribution: Ambon, Ceram, Halmahera, Salawatti, Biak, Numfor and north-west Irian Jaya. The species *Tropidonophis elongatus* is herein restricted to Ambon (the type locality) and Ceram.

Etymology: Named in recognition of Alan Brygel as detailed in the books *The Hoser Files: The Fight Against Entrenched Official Corruption* and *Victoria Police Corruption* (1 and 2), (Hoser 1995, 1999a, 1999b).

As a humble taxi driver he worked 6 days a week for several years and after starting with nothing ended up with a large house in North Melbourne, Victoria, Australia and a magnificent property on Beach Road, Black Rock, Melbourne, Australia.

He then made what was in hindsight a serious error in attempting to expose corruption involving then head of the Vicroads Taxi Licencing branch, Terry O'Keefe and police officers who were using their positions to corruptly protect high-level criminal enterprises.

In terms of the relevant politicians and law enforcement officers supposed to be overseeing the corrupt bureaucrats, they too were corrupt. Therefore instead of dealing with the problems identified by Brygel, Brygel himself was bashed, robbed, seriously injured and then charged with threatening to kill three politicians (Spyker, Sandon and Roper).

Brygel was exonerated of the charges, but not because he was innocent.

He was cleared only because he managed to pass the original of a tape recording that cleared himself to me before the Victoria Police raided his house and took what was a copy of the original.

That tape of the alleged conversation where Brygel was alleged to have made the threats to kill showed quite clearly that nothing of the sort had been made.

In spite of being cleared, Brygel spent four months in jail and was subsequently financially destroyed, being forced to liquidate his assets and is now another destitute corruption whistleblower in Australia.

For the record, the corrupt police officer who fabricated the threat to kill charges against Brygel, John Cullen, was never punished. He did leave the police force after he was caught on video stealing a hairdryer from K-mart in East Burwood in Melbourne, for which he was subsequently charged and found guilty in the Melbourne Magistrate's court.

Also for the record, while the Rupert Murdoch owned newspaper

the *Herald-Sun* prominently published details of the totally false claims against Brygel to destroy his good reputation in at least four different newspapers, at no stage did the same newspaper (or any other in Melbourne) ever report that Brygel had been falsely accused, falsely charged and totally exonerated.

While there are reptiles named in honor of corrupt and dishonest people and those who can "pay" for the naming rights, there are few if any named in honor of decent well-meaning people whose only crime was to speak out when they saw misconduct involving government officers who are supposed to operate in the trust of the public.

TROPIDONOPHIS (ALANBRYGELUS) ELONGATUS (JAN, 1863)

Diagnosis: Separated from all other *Tropidonophis* (except for *T. alanbrygeli* sp. nov. and *T. smythi* sp. nov. as described below), by the following suite of characters: 15 dorsal mid-body rows, 3 posterior temporals, rarely 2, 4 or more and 155-175 ventrals, 85-108 subcaudals.

Other features include, 8 (rarely 7 or 9) postoculars, 10 supralabials, with numbers, 3-5 or 4-6 in contact with the eye, 9-10 (rarely 8) infralabials, 2 (rarely 1, 3, 4 or 5) anterior temporals, 2-3, rarely 1, 4 or 5 posterior temporals.

As noted by the species name, this group of snakes are a relatively elongate form of *Tropidonophis*, reflected by their consistently higher ventral and subcaudal counts.

The species *Tropidonophis elongatus* is separated from the taxa described below, namely *T. alanbrygeli* sp. nov. and *T. smythi* sp. nov. by the following suite of characters: stripes on the posterior dorsum, high subcaudal counts within the range given above, well-developed subcaudal pits, long eight and six subcaudal scale rows and a narrow subchoanal process.

Distribution: *Tropidonophis elongatus* is herein restricted to Ambon (the type locality) and Ceram.

Other related taxa (described immediately below) are found on Halmahera, Salawatti, Biak, Numfor and north-west Irian Jaya.

TROPIDONOPHIS (ALANBRYGELUS) ALANBRYGELI SP. NOV.

Holotype: A specimen in the Naturhistorisches Museum Basel, Switzerland, from the entrance to Argoeni Bay, Irian Jaya, Indonesia, specimen number: NMB 19143.

The Naturhistorisches Museum Basel, Switzerland is a government owned facility that allows researchers access to their collection.

Paratype: A specimen at the Zoologisch Museum, Universiteit van Amsterdam, The Netherlands, from Fak Fak, Irian Jaya, Indonesia, specimen number: ZMA 11431.

The Zoologisch Museum, Universiteit van Amsterdam, The Netherlands is a government owned facility that allows researchers access to their collection.

Diagnosis: Separated from all other *Tropidonophis* except *T. elongatus* and *T. smythi* sp. nov. by the following suite of characters: 15 dorsal mid-body rows, 3 posterior temporals, rarely 2, 4 or more and 155-175 ventrals, 85-108 subcaudals.

Other features include, 8 (rarely 7 or 9) postoculars, 10 supralabials, with numbers, 3-5 or 4-6 in contact with the eye, 9-10 (rarely 8) infralabials, 2 (rarely 1, 3, 4 or 5) anterior temporals, 2-3, rarely 1, 4 or 5 posterior temporals.

Separated from *T. elongatus* by having weakly developed head, caudal and subcaudal scale pits, level of reduction of dorsal scale rows and caudal scale row lengths as well as a tendency for the division of the posterior temporals.

There are a series of dark spots on the posterior body for the nominate form of this species from the north of New Guinea island (Irian Jaya), whereas specimens from Halmahera, described below as *T. smythi* sp. nov. are identifiable by dark dorsal cross-bands running across the rear of the body.

Specimens referable to the New Guinea species include those

from the nearby islands of Noemfor and Biak, which have a reticulate or plain coloration on the posterior body respectively, but are otherwise essentially similar in most respects to mainland *alanbrygeli* sp. nov..

The Biak form is described as a subspecies below.

T. alanbrygeli sp. nov. is further separated from *T. smythi* sp. nov. by having a narrow subchoanal process, versus a prominent one in *T. smythi* sp. nov..

Distribution: North-west island New Guinea (Irian Jaya, Indonesia) and immediately adjacent islands, including Noemfor and Biak.

Etymology: See for subgenus *Alanbrygelus* gen. nov..

TROPIDONOPHIS (ALANBRYGELUS) ALANBRYGELI SAMMYWATSONAE SUBSP. NOV.

Holotype: A specimen from the island of Biak, Irian Jaya, Indonesia, lodged at the Leiden Nationaal Natuurhistorische Museum (RMNH), Leiden, The Netherlands, Specimen number: RMNH 18160.

The Leiden Nationaal Natuurhistorische Museum (RMNH), Leiden, The Netherlands is a government owned facility that allows researchers access to their collection.

Diagnosis: As for the nominate form except for having a uniform posterior dorsal pattern as opposed to reticulate or spotted.

Compared to the nominate form, scale counts differ, including 168 ventrals average (both sexes) versus 161 for the nominate form and the reduction to 15 mid-body scale rows is delayed to the equivalent of the twelfth ventral which is further down the body than for all other described taxa within the subgenus *Alanbrygelus* subgen. nov.

Separated from all other *Tropidonophis* except *T. elongatus* and *T. smythi* sp. nov. by the following suite of characters: 15 dorsal mid-body rows, 3 posterior temporals, rarely 2, 4 or more and 155-175 ventrals, 85-108 subcaudals.

Other features include, 8 (rarely 7 or 9) postoculars, 10 supralabials, with numbers, 3-5 or 4-6 in contact with the eye, 9-10 (rarely 8) infralabials, 2 (rarely 1, 3, 4 or 5) anterior temporals, 2-3, rarely 1, 4 or 5 posterior temporals.

Separated from *T. elongatus* by having weakly developed head, caudal and subcaudal scale pits, level of reduction of dorsal scale rows and caudal scale row lengths as well as a tendency for the division of the posterior temporals.

Specimens from Halmahera, described below as *T. smythi* sp. nov. are identifiable by dark dorsal cross-bands running across the posterior of the body.

Specimens referable to the New Guinea species (the nominate form) include those from the nearby islands of Noemfor and Biak, which have a reticulate coloration on the posterior body respectively, but are otherwise essentially similar in most respects to mainland *alanbrygeli* sp. nov.

T. alanbrygeli sp. nov. (including this subspecies) is further separated from *T. smythi* sp. nov. by having a narrow subchoanal process, versus a prominent one in *T. smythi* sp. nov..

Distribution: Restricted to Biak Island, Indonesia.

Etymology: Named in honor of Sammy Watson of Croydon/ Bayswater, Victoria, Australia for services to Snakebusters reptile shows and wildlife education to the Victorian public over a two year period.

TROPIDONOPHIS (ALANBRYGELUS) SMYTHI SP. NOV.

Holotype and paratypes: Three snakes in the Leiden Nationaal Natuurhistorische Museum (RMNH), from the Island of Halmahera, Indonesia, specimen number: RMNH 4800 (3 specimens). The holotype is the female. The paratypes are the males.

The Leiden Nationaal Natuurhistorische Museum (RMNH), Leiden, The Netherlands is a government owned facility that

allows researchers access to their collection.

Diagnosis: Separated from all other *Tropidonophis* except *T. elongatus* and *T. alanbrygeli* sp. nov. by the following suite of characters: 15 dorsal mid-body rows, 3 posterior temporals, rarely 2, 4 or more and 155-175 ventrals, 85-108 subcaudals. Other features include, 8 (rarely 7 or 9) postoculars, 10 supralabials, with numbers, 3-5 or 4-6 in contact with the eye, 9-10 (rarely 8) infralabials, 2 (rarely 1, 3, 4 or 5) anterior temporals, 2-3, rarely 1, 4 or 5 posterior temporals.

Separated from *T. elongatus* by having weakly developed head, caudal and subcaudal scale pits, level of reduction of dorsal scale rows and caudal scale row lengths as well as a tendency for the division of the posterior temporals.

T. smythi sp. nov. are identifiable and separated from all forms of *T. alanbrygeli* sp. nov. by dark dorsal cross-bands running across the posterior of the body.

T. alanbrygeli sp. nov. is further separated from *T. smythi* sp. nov. by having a narrow subchoanal process, versus a prominent one in *T. smythi* sp. nov..

Distribution: Restricted to Halmahera Island, Indonesia.

Etymology: Named in honor of Michael Smyth, who spent 8 years educating many hundreds of thousands of Victorians through working with Snakebusters, Australia's best reptiles displays. He came to us as a young work-experience student and was too good to let go.

Content of subgenus *Alanbrygelus* subgen. nov.

Tropidonophis (Alanbrygelus) elongatus (Jan, 1863) (Type species).

Tropidonophis (Alanbrygelus) alanbrygeli sp. nov.

Tropidonophis (Alanbrygelus) smythi sp. nov.

SUBGENUS STYPORHYNCHUS PETERS, 1863

Content of subgenus *Styporchynchus* Peters, 1863.

Tropidonophis (Styporchynchus) truncatus (Peters, 1863) (Type species).

Tropidonophis (Styporchynchus) dahlii (Werner, 1899).

Tropidonophis (Styporchynchus) halmahericus (Boettger, 1895).

Tropidonophis (Styporchynchus) hypomelas (Günther, 1877) (Type for genus *Macropophis* Günther, herein synonymised with *Styporchynchus*).

SUBGENUS TROPIDONOPHIS JAN, 1863

Type species: *Tropidonotus picturatus* Schlegel, 1837

Diagnosis: As for the genus as diagnosed above and by removal of the subgenera *Alanbrygelus* subgen. nov. and *Desburkeus* subgen. nov. as diagnosed above.

Excluding the species identified above as being within *Styporchynchus*, all other species within the genus *Tropidonotus* are within this subgenus.

Tropidonotus and *Styporchynchus* are similar in most respects and an argument could be mounted to include both within a single subgenus (in which case *Tropidonotus* would take priority).

Both groups *Tropidonotus* and *Styporchynchus* are separated from the above defined new subgenera *Alanbrygelus* subgen. nov. and *Desburkeus* subgen. nov. by the diagnoses within each of these new subgenera.

TROPIDONOPHIS (TROPIDONOPHIS) MULTISCUTELLATUS (BRONGERSMA, 1948)

Diagnosis: Separated from all other *Tropidonophis* by the following suite of characters: 15 dorsal mid-body rows, 136-158 ventrals, 74-103 subcaudals, 2 (rarely 1 or 3) preoculars, 3 (rarely 2 or 4) postoculars, 8 (rarely 7 or 9) supralabials, with numbers 3-5 or 4-6 in contact with the eye, 9 (rarely 8 or 10) infralabials, 2 (rarely 1, 3, or 4) anterior temporals, 2 rarely (1, 3, or 4) posterior temporals.

Distribution: Island New Guinea and adjacent small islands, excluding the savannah regions in the south of the island.

TROPIDONOPHIS (TROPIDONOPHIS) MULTISCUTELLATUS COTTONI SUBSP. NOV.

Holotype: A specimen from Matiska, Central province, Papua New Guinea in the American Museum of Natural History (AMNH), specimen number, AMNH 59074.

The American Museum of Natural History is a government owned facility that allows researchers access to their collection.

Paratypes: A specimen from Matiska, Fife Bay Milne Bay, Province, Papua New Guinea in the Australian Museum (Sydney), specimen number: R 6513.

The Australian Museum is a government owned facility that allows researchers access to their collection.

Two specimens from Matiska, Central province, Papua New Guinea in the American Museum of Natural History (AMNH), specimen numbers, AMNH 59075-76.

The American Museum of Natural History is a government owned facility that allows researchers access to their collection.

Diagnosis: Separated from the nominate form of the species *Tropidonophis m. multiscutellatus* by the general absence of a nuchal collar which is usually present in the nominate race.

T. m. cottoni subsp. nov. is also separated by the average shorter tails (both sexes) and lower average number of subcaudals as a result. This gives these snakes a lower average ventral plus subcaudal count; average of 234 in *T. m. cottoni* subsp. nov. versus 238 or higher in the nominate form (depending on region).

In the nominate race there is a tendency for there to be up to four postoculars and as a result lose contact between the upper postocular and the temporal. Such a condition is rare in *T. m. cottoni* subsp. nov..

Male *T. m. cottoni* subsp. nov. have well-developed subcaudal pits, a trait not seen in the nominate race.

Distribution: *T. m. cottoni* subsp. nov. is found in the south-east and nearby regions, generally in the zone east of the Sepik and Fly river basins. The nominate subspecies *T. m. multiscutellatus* is found in the other parts of island New Guinea, excluding the savannah regions in the south of the island.

Etymology: In recognition of the excellent 8 years of work Tom Cotton has done educating many thousands of people with Snakebusters, Australia's best reptile shows and displays, by teaching people to be nice to reptiles and in particular pointing out the cruel and inhumane treatment of reptiles by so-called snake handlers using metal tongs.

TROPIDONOPHIS (TROPIDONOPHIS) NOVAEGUINEAE (LIDTH DE JUDE, 1911)

Diagnosis: Separated from all other *Tropidonophis* by the following suite of characters: 15 dorsal mid body rows, 128-143 ventrals, 38-59 subcaudals, 2 (rarely 3-4) preoculars, 8 (rarely 7 or 9) supralabials with numbers 3-5 in contact with the eye, 9 (rarely 8 or 10) infralabials, 2, (rarely 1, 3 or 4) anterior temporal, 3 (rarely 2, 4 or 5) posterior temporals).

Distribution: Most parts of island New Guinea.

TROPIDONOPHIS (TROPIDONOPHIS) NOVAEGUINEAE TRIOANI SUBSP. NOV.

Holotype: A specimen in the Leiden Nationaal Natuurhistorische Museum (RMNH), Leiden, The Netherlands, from Missol Island, Irian Jaya, specimen number, RMNH4810a (female).

The Leiden Nationaal Natuurhistorische Museum (RMNH), Leiden, The Netherlands is a government owned facility that allows researchers access to their collection.

Paratype: A specimen in the Leiden Nationaal Natuurhistorische Museum (RMNH), Leiden, The Netherlands, from Missol Island, Irian Jaya, specimen number, RMNH4810b (female).

Diagnosis: *T. n. trioani* subsp. nov. is separated from *T. n. novaeguineae* by colouration and the fact that females have a lower subcaudal count than seen in the nominate race of *T. n. novaeguineae* (38-41 vs over 43 in the nominate subspecies).

Tail length in these specimens is noticeably shorter than in the nominate form (12-15.9% versus 17.2-19.3%).

Development of subcaudal pits is also widely divergent for *T. n. trioani* subsp. nov. as opposed to the nominate form (22-47.4% versus 57.7% or higher).

Temporals are fragmented in *T. n. trioani* subsp. nov., especially the rear ones which have a configuration of 2+6/4+5 or 3+6/3+4.

Colouration in *T. n. trioani* subsp. nov. differs from the nominate subspecies in that there is a dark stripe extending from the nostril to the eye and it continues from the postoculars to the corner of the mouth expanding somewhat onto the posterior gular area then reducing in width and continuing on the first scale row to the level of the fifth ventral. The supralabials are dusted brown to the lip edge. On the underside the lip is heavily dusted with brown, which continues posteriorly in the form of spots to about the same level as the dorsal pattern.

Distribution: *T. n. trioani* subsp. nov. is presently only known from Missol Island, Irian Jaya. The nominate subspecies is thought to occupy the rest of the known range.

TROPIDONOPHIS (TROPIDONOPHIS) PICTURATUS (SCHLEGEL, 1837)

Diagnosis: Separated from all other *Tropidonophis* by the following suite of characters: 15 dorsal mid-body scale rows, 117-140 ventrals, 38-68 subcaudals, 2, (rarely 1 or 3) preoculars, 3 (rarely 4 or 5) postoculars, 8-9 (rarely 7) supralabials with numbers -45 or 4-6 in contact with the eye, 8-9 (rarely 7 or 10) infralabials, 2-3, rarely 1-4 anterior temporals, 2-3, rarely 1-4 posterior temporals.

Distribution: Island New Guinea and nearby offshore islands including Misool, Salwatti and Waigeau.

TROPIDONOPHIS (TROPIDONOPHIS) PICTURATUS PILLOTTI SUBSP. NOV.

Holotype: A specimen from Haveri, Central Province, Papua New Guinea, specimen number, MCSN 42697b, lodged at the Museo Civico di Storia Naturale, Génova, Itàlia (MCSN).

This is a government owned facility that allows researchers access to their collection.

Paratype: A specimen in the British Museum of Natural History from Morokoa, Central Province, Papua New Guinea, specimen number: BMNH 97.12.10.113. This is a government owned facility that allows researchers access to their collection.

The British Museum of Natural History is a government owned facility that allows researchers access to their collection.

Diagnosis: *T. pillotti* subsp. nov. is separated from the nominate form by the following traits, a relatively shorter tail (20.8-24.5% in males, 17.5-22.9% in females versus 23-27.8% in males, 20.6-26.3% in females), with a correspondingly lower ventral count (117-123 in males, 118-136 females, versus 122-136 in males and 122-140 in females) and ventrals plus subcaudals count (162-183 in males, 160-196 in females versus 179-204 in males and 177-203 in females), as well as a lower subcaudal count (44-60 in males, 38-60 in females versus 52-68 in males, 48-66 in females). The eye is relatively smaller (20% versus 21%), there are fewer maxillary teeth (average 30.3 versus 31.5) and there are usually fewer anterior and posterior temporals.

Distribution: The region east of the Fly and Sepik River basins. The nominate form occupies the rest of the range. Specimens from islands south-west of New Guinea may be of a different subspecies.

Etymology: Named in honor of Christian Pillott of Airlie Beach, Queensland, Australia for his magnificent work in ridding Australia of feral pest species of vegetation, specifically including *Pinus radiata* in the Melbourne suburb of Park Orchards.

Pillott also did a great job of alerting security at the Healesville Timber Festival in 2006, when a "Zoos Victoria" employee Mike Taylor attempted to create a public disturbance at a Snakebusters reptile display.

Taylor was clearly drunk at the time and was ejected from the event after he commenced yelling abuse at unformed Snakebusters staff, threatening to kill them.

On a separate occasion, Camilla Martin, another Zoos Victoria employee was busted trying to steal a snake from a Snakebusters display at Brunswick Shopping Mall.

Mention is made of these and other unlawful attempts by persons within the government-run Zoos Victoria business to attack companies they see as superior competitors to their own cruel and dysfunctional animal displays.

Content of genus *Tropidonophis* Jan, 1863.

Tropidonophis aenigmaticus Malnate and Underwood, 1988.

Tropidonophis (Brygelus) brygeli sp. nov.

Tropidonophis (Styporchynchus) dahlui (Werner, 1899).

Tropidonophis dolasii Kraus and Allison, 2004.

Tropidonophis (Desburkeus) doriae Boulenger, 1897.

Tropidonophis (Brygelus) elongatus Jan, 1863.

Tropidonophis (Styporchynchus) halmahericus (Boettger, 1895).

Tropidonophis (Styporchynchus) hypomelas (Günther, 1877) (Synonymous with *Macropophis* Boulenger, 1893).

Tropidonophis mairii (Gray, 1841) (Synonymous with *Katophis plumbea* Macleay 1877).

Tropidonophis mcdowellii Malnate and Underwood, 1988.

Tropidonophis montanus (Lidith De Jude, 1911).

Tropidonophis multiscutellatus (Brongersma, 1948).

Tropidonophis novaeguineae (Lidith De Jude, 1911) <http://reptile-database.reptarium.cz/species?genus=Tropidonophis&species=novaeguineae&search_

param=%28%28taxon%3D%27Natricinae%27%29%29>.

Tropidonophis parkeri Malnate and Underwood, 1988.

Tropidonophis picturatus (Schlegel, 1837) (Type species).

Tropidonophis punctiventris (Boettger, 1895).

Tropidonophis (Brygelus) smythi sp. nov.

Tropidonophis statistictus Malnate and Underwood, 1988.

Tropidonophis (Styporchynchus) truncatus (Peters, 1863).

INTRODUCTION AMPHIESMA

The paraphyletic nature of the genus *Amphiesma* Duméril, Bibron and Duméril, 1854 has been recognized by many authors who have either expressed this view directly (e.g. Guo et al. 2012) or by referring to the various species groups (e.g. Malnate and Underwood 1988).

Reluctance to use the available genus names for given species groups has been due to several factors, not the least being that: 1/ These names were synonymized a long time ago by other authors and;

2/ If a recent author were to break up the genus, there would be no "naming rights" for the major groups and yet the author would get the notoriety among peers for breaking up a familiar genus.

Notwithstanding these ongoing issues, the fact remains that as of 2012 and in the light of a greater than ever raft of data showing the deep phylogenetic splits within the genus *Amphiesma* as presently understood, there remains a need to properly identify these units from a taxonomic viewpoint.

An ongoing problem remains in that the boundaries of many species remains uncertain and others are undescribed, making proper assignment of species to genera somewhat difficult.

Important studies published on snakes in this genus include, Alcalá (1986), Boulenger (1887, 1893, 1899), Cox (1991), David and Das (2003), David and Vogel (1996, 2010), David et al. (1998), David et al. (2007), De Rooij (1917), Mumpuni (2001), Nguyen et al. (2009), Ota and Iwanaga (1997), Schenkel (1901), Smith (1943), Stejneger (1907), Stuebing and Inger (1999), Thompson and Thompson (2008), Tweedie (1983), Wall

(1925), Zhao and Adler (1993), Ziegler and Quyet (2006).

Within the genus *Amphiesma* as currently defined, there are available names for the following well-defined species groups.

Amphiesma Duméril, Bibron and Duméril, 1854 for the type species, *Coluber stolatus* Linnaeus, 1758 and closest related taxa.

Herpetoreas Günther, 1860 for *Herpetoreas sieboldii* Günther, 1860 and the similar *A. platyceps* (Blyth, 1854).

Paranatrix Mahendra, 1984 designated for *Tropidonotus modestus* Günther 1875 and related (mainly western) species, including the so-called *khasiensis* group as identified by Malnate (1960).

Due to the ongoing disputes in terms of which species within each group are valid and which are not, I shall not publish here a list of recognized species within each of these groups, but instead group them within a listing for *Amphiesma* sensu lato below, merely noting here that some recognized species may be synonymous with others, while others are clearly composite.

Five species groups do not however appear to have genus names for their species even though all five are perhaps the most divergent within *Amphiesma* as currently recognized.

Therefore they are defined and named below according to the Zoological Code (Ride et al. 1999). A divergent taxon within the Indonesian (Sunda) *Amphiesma* is also placed in a subgenus (presently monotypic) in recognition of its divergence from the main *Amphiesma* stock.

The species groups formally placed in new genera include the following:

- Three divergent species from the Ryukyu Islands (Japan).
- The morphologically divergent taxon *viperinum* from Sumatra.
- Five species with 17 mid-body scale rows (versus the usual 19) found mainly in the Sundas and adjacent south-east Asian mainland.
- The so-called *bitaeniatum* group of species.
- The so-called *craspedogaster* group of species.

The divergent species taxon *flavifrons* is kept within the broader *Amphiesma* sensu lato but is placed within a new monotypic subgenus.

These new taxonomic units are *Greematrix* gen. nov., *Wellsnatrix* gen. nov., *Wellingtonnatrix* gen. nov., *Elliottnatrix* gen. nov., *Asianatrix* gen. nov. and *Sundanatrix* subgen. nov. respectively.

GENUS AMPHIESMA DUMÉRIL, BIBRON AND DUMÉRIL 1854

Type species: *Coluber stolatus* Linnaeus, 1758.

Diagnosis: The diagnosis for the genus here is modified from those published by the sources cited herein. In this paper the diagnosis fits for the genus *Amphiesma* sensu lato and including the named and synonymized genera, *Herpetoreas* Günther, 1860 and *Paranatrix* Mahendra, 1984.

As currently recognized this is one of a number of Natricine genera from the south-east Asian region. It is a solid toothed non-venomous genus of snakes with strongly keeled scales on the body with 19 (less commonly 17) dorsal mid-body rows and generally with reduction on the neck or posterior trunk (in contrast to *Tropidonophis* diagnosed above), (although four species in *Amphiesma* do not have any reduction in scale row number on the neck or posterior trunk), anal usually divided and all subcaudals divided.

According to Malnate (1968), *Tropidonophis* species are assigned when they have at least three of the following characters: 1/ pits in more than 10 per cent of the subcaudals, 2/ a uniform number of scale rows on the trunk, 3/ reduction of the number of caudal scale rows to four occurs posterior to the midnumber of subcaudals and the greatest length of the scale

row sets is that of six rows, 4/ a subchoanal process on the palatine bone.

A list of recognized species within the genus *Amphiesma* as recognized herein is published after the formal description of *Asianatrix* gen. nov..

Snakes within the genus *Amphiesma* are most easily diagnosed by a process of exclusion for the genus *Tropidonophis* above and then comparing with the new diagnoses for the genera described within this paper.

Like *Tropidonophis*, these species are most common near water.

Amphiesma are found throughout most of the warmer parts of Asia from India to Japan and on the mainland in areas marginally north of there.

SUBGENUS *SUNDANATRIX* SUBGEN. NOV.

Type species: *Tropidonotus flavifrons* Boulenger, 1887

Diagnosis: This subgenus is monotypic for the species *flavifrons*.

It is separated from all other *Amphiesma* (including other genera defined within this paper) by the unique combination of having 19 mid-body scale rows and a single anal plate. The only other taxon within *Amphiesma* (including other genera defined within this paper) with a single anal plate is *groundwateri* but it has 17 dorsal mid-body rows.

The species *flavifrons* is also diagnosed by the following characters, 2 anterior temporals, 146-157 ventrals, 87-102 subcaudals, 8-9 supralabials, and a very distinct pattern of dorsolateral spots and crossbars on an olive-grey dorsum and a large distinctive white to yellowish-cream spot covering the snout. The belly has large dark spots. The last maxillary teeth are not greatly enlarged.

Distribution: Known only from the island of Borneo, Indonesia.

Etymology: Named after the region in which the genus occurs.

GENUS *GREERNATRIX* GEN. NOV.

Type species: *Tropidonotus pryeri* Boulenger, 1887

Diagnosis: Of note is that this genus is endemic to the Ryukyu Islands (Japan).

While these snakes are morphologically distinct from all other *Amphiesma*, the two species within this genus are separated from all other species genera within *Amphiesma* (including genera defined below) by their consistently higher ventral count, being 167-188 (both sexes), versus below 166 (both sexes) for all other taxa. Almost all other species within *Amphiesma* (including genera defined below) have a range of 120-150 ventrals (both sexes).

The only species within *Amphiesma* (including genera defined below) coming close to *Greernatrix* gen. nov. in ventral count is the taxon *frenatum* from the distant island of Borneo, also removed from *Amphiesma* herein. That species has a ventral count ranging up to 166 (David and Das 2003), and it should be noted that high-number counts are for males, with the minimum male count for *Greernatrix* gen. nov. being 172 (Malnate 1960).

Other characteristics diagnostic for *Greernatrix* gen. nov. are 94-132 subcaudals, a considerably higher average number than for any other species within *Amphiesma* (including genera defined below), see for example the table in Malnate (1960).

In terms of the above diagnosis, one species taxon is exceptional, namely *arguus* David and Vogel (2010), described within the genus *Amphiesma* (now placed in *Wellingtonatrix* gen. nov.). It has ventral and subcaudal ranges in line with *Greernatrix* gen. nov. but is easily separated from *Greernatrix* gen. nov. by having 17 as opposed to 19 mid body rows.

Distribution also separates the taxa, with *arguus* David and Vogel (2010) endemic to the island of Borneo, Indonesia.

The presence of 10-11 infralabials further separates the taxon from all other *Amphiesma* (including genera defined below), with the exception of the taxon *craspedogaster*, which shares this trait. Most other *Amphiesma* (including genera defined below)

have 8-9 infralabials.

Greernatrix is a noticeably slender form by comparison to other *Amphiesma*.

Distribution: Endemic to the Ryukyu Islands (Japan). Found only on the Ishigaki-shima, Miyakojima and Yaeyama groups of the Ryukyu Islands, Japan.

Etymology: Named in honor of Allen E. Greer, formerly of the Australian Museum in recognition of a distinguished herpetological career.

Content of *Greernatrix* gen. nov.

Greernatrix pryeri (Boulenger, 1887) (Type species).

Greernatrix concelarum (Malnate, 1963).

Greernatrix ishigakiense (Malnate and Munstermann, 1960).

GENUS *WELLSNATRIX* GEN. NOV.

Type species: *Xenochrophis viperinus* Schenkel, 1901

(Seen in most contemporary texts as *Amphiesma viperinus*)

Diagnosis: This is a monotypic genus for a highly distinct species taxon that appears to have been placed in *Amphiesma* in recent years almost in recognition that this genus was the closest match for this taxon.

Wellsnatrix viperinus is most easily separated from all *Amphiesma* (including genera defined below) by its ventral count of 100-120, being lower than for the other species, all being over 134.

This relatively stout snake also has a lower average subcaudal count (59) as opposed to an average of about 80-120 for *Amphiesma* (including genera defined below).

Distribution: Known only from the region of the Indragiri River, Riau Province, Sumatra, Indonesia.

Etymology: Named in honor of Richard Wells of Sydney NSW, Australia, now of Lismore, northern NSW in recognition of a distinguished herpetological career.

Content of *Wellsnatrix* gen. nov.

Wellsnatrix viperinus (Schenkel, 1901) (Type species).

GENUS *WELLINGTONATRIX* GEN. NOV.

Type species: *Amphiesma arquus* David and Vogel, 2010

Diagnosis: A group of species from the Sunda region formerly placed within *Amphiesma*.

They are separated from other *Amphiesma* (including genera defined above and below) by the fact that these species have 17 dorsal mid body rows, as opposed to 19.

They are further differentiated by a relatively high ventral count and relatively elongate bodies.

The species within the so-called *venningi* complex, specifically including *vennigi* and *sauteri* and which also have 17 mid-body rows (the only others within *Amphiesma sensu lato* to do so) are separated from *Wellingtonatrix* by having strongly keeled dorsal scales in the region of the vent and on the tail and a dark venter and more stout build.

Males in the *venningi* complex have different hemipenal morphology to those in *Wellingtonatrix* gen. nov., the obvious difference being that in the *venningi* complex the fully everted hemipenis goes beyond subcaudal 9, whereas it does not in *Wellingtonatrix* gen. nov..

Distribution: *Wellingtonatrix* are distributed in the islands of the Sundas and the nearby Asian Mainland that forms part of the same biogeographic region

Etymology: Named in honor of Cliff Ross Wellington of NSW, in recognition of a distinguished herpetological career.

Content of *Wellingtonatrix* gen. nov.

Wellingtonatrix arquus (David and Vogel, 2010) (Type species).

Wellingtonatrix atemporale (Bourret, 1934).

Wellingtonatrix frenata (Dunn, 1923).

Wellingtonatrix groundwateri (Smith, 1922).

Wellingtonatrix sarawacense (Günther, 1872).

GENUS ELLIOTTNATRIX GEN. NOV.

Type species: *Natrix bitaeniata* Wall, 1925

Diagnosis: This new genus includes the species group consisting of the three taxa, *bitaeniatum*, *parallelum*, *octolineatum*. They are separated from all other species within the genus *Amphiesma* (including genera defined above and below) by their unique patterning.

These species are characterized by a distinctly longitudinally striped pattern. They are also morphologically very similar with similar scale counts. All share a grey, greyish-brown, ochre brown or pale brown background, an overall striped pattern with at least a lighter, more or less distinct, black edged dorsolateral stripe, and 19 (unusually 17) mid-body scale rows.

The only *Amphiesma* likely to be confused with these species are the similar looking species *platyceps* and *sieboldi* and they are separated by having no dorsolateral stripe, or at best a row of white dots; a narrow, black or dark brown subocular and postocular streak; posterior maxillary teeth greatly and abruptly enlarged, twice as long as other maxillary teeth; versus, a distinct, broad, pale and continuous dorsolateral stripe from the neck to the end of tail; a conspicuous, wide black or dark brown postocular streak; posterior maxillary teeth distinctly enlarged, but less than twice as long as other maxillary teeth in *Elliottnatrix* gen. nov..

Distribution: Eastern Himalayas and neighbouring areas.

Etymology: Named in recognition of Adam Elliott of Hoppers Crossing, Victoria and his distinguished career in reptile husbandry, publications and the like, viciously destroyed by an illegal armed raid by Glenn Sharp now working as a so-called enforcement officer, who notably fails to enforce the law and instead uses his unfettered powers to stalk, harass and destroy the lives of decent people whom he takes a hatred to.

It should also be noted that in his tuggery Sharp has permanently traumatized and terrorized women and children including Adam's wife, Liz, who had to suffer the indecency of having loaded guns pointed at her and her two young children during one of the many illegal armed raids, Elliott and his family endured.

Content of *Elliottnatrix* gen. nov.

Elliottnatrix bitaeniatum (Wall, 1925) (Type species).

Elliottnatrix parallelum (Boulenger, 1890).

Elliottnatrix octolineatum (Boulenger, 1904).

GENUS ASIANATRIX GEN. NOV.

Type species: *Tropidonotus craspedogaster* Boulenger, 1899

Diagnosis: This genus is a moderately built group of species within the context of the *Amphiesma* sensu lato, in that there are no extreme forms within this group.

The genus is defined and separated from all other *Amphiesma* (including genera defined above) by the following suite of characters in combination: 120-155 ventrals, divided anal, 70-98 all divided subcaudals, 19 mid-body rows, rarely 17, moderately keeled dorsal scales (as opposed to strongly keeled in most remaining *Amphiesma*), tail length (both sexes) averages 30% of body length, versus 27% in *Amphiesma* (species within the genus after species in genera defined herein are removed), 8-9 infralabials, 7-8 supralabials, pattern not consisting of longitudinal stripes.

Invariably specimens within this genus have a pattern of distinct dark and light vertical bars or similar markings on the upper labials, sometimes not reaching the level of the eye and considerably more prominent than any in other *Amphiesma*, which commonly have the same configuration, but noticeably less distinct.

Distribution: East Asia.

Etymology: Named in reflection of where these snakes originate.

Content of *Asianatrix* gen. nov.

Asianatrix craspedogaster (Boulenger, 1899) (Type species).

Asianatrix popei (Schmidt, 1925).

Asianatrix sauteri (Boulenger, 1909).

Asianatrix vibakari (Boie, 1826).

Species remaining within *Amphiesma***(includes genera *Herpetoreas* and *Paranatrix*).**

Amphiesma andreae Ziegler and Le Khac Quayet, 2006.

Amphiesma beddomei (Günther, 1864).

Amphiesma boulengeri (Gressitt, 1937).

Amphiesma celebicum (Peters and Doria, 1878).

Amphiesma deschauenseei (Taylor, 1934).

Amphiesma (Sundanatrix) flavifrons (Boulenger, 1807).

Amphiesma inas (Laidlaw, 1901).

Amphiesma johannis (Boulenger, 1908).

Amphiesma kerinciense David and Das, 2003.

Amphiesma khasiense (Boulenger, 1890).

Amphiesma leucomystax David, Bain, Quang, Truong, Orlov, Vogel, Ngoc, Thanh and Zeigler, 2007.

Amphiesma metusia Inger, Zhao, Shaffer and Wu, 1990.

Amphiesma miyajimae (Maki, 1931).

Amphiesma modestum (Günther, 1875).

Amphiesma monticola (Jerdon, 1853).

Amphiesma nicobariense (Sclater, 1891).

Amphiesma optatum (Hu and Zhao, 1966).

Amphiesma pealii (Sclater, 1891).

Amphiesma petersii (Boulenger, 1893).

Amphiesma platyceps (Blyth, 1854).

Amphiesma sanguineum (Smedley, 1931).

Amphiesma sarasinorum (Boulenger, 1896).

Amphiesma sieboldii (Günther, 1860).

Amphiesma stolatum (Linnaeus, 1758).

Amphiesma venningi (Wall, 1910).

Amphiesma xenura (Wall, 1907)

FIRST REVISER NOTE:

In the event that any subsequent author seeks to revise the taxonomy within and merge any genera, subgenera, species or subspecies, then the order of priority of conservation should be the same order as they appear in this paper.

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