

A further breakup of the *Boiga cynodon* (Boie, 1827) species complex (Serpentes: Colubridae).

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ABSTRACT

The Dog Toothed Cat Snake *Boiga cynodon* (Boie, 1827) from south-east Asia, including western Indonesia (the type locality) has long been suspected by herpetologists as comprising a wide-ranging species complex (e.g. Orlov and Ryabov 2002 or Ramadhan *et al.* 2010).

The latter authors formally named the Nusa Tenggara Islands population as the species *B. hoeseli* based on significant and consistent morphological differences.

Inspection of specimens from across the range of the putative species show consistent differences in populations, which combined with geographical isolation of each, makes a firm case for recognition of more than one species.

In accordance with the *International Code of Zoological Nomenclature* (Ride *et al.* 1999), this paper further divides the putative species *B. cynodon* as currently recognized into four species.

The nominate form from Sumatra and Java includes *B. waandersi* (Bleeker, 1860) from Bali treated herein as synonymous to *B. cynodon*.

The other three species formally named for the first time are *B. donagheyae* sp. nov. from Peninsula Malaysia, *B. germainegreerae* sp. nov. from Mindanao Island in the Philippines and *B. mickpitmani* sp. nov. from northern Borneo.

This paper also notes and corrects a typographical error in the original description of the genus *Mulvanyus* to confirm the nomenclatural availability of the name.

Keywords: Taxonomy; snakes; Asia; south-east Asia; Indonesia; Philippines; Malaysia; genus; *Boiga*; *Dorisius*; *Mulvanyus*; *Slopboiga*; species; *cynodon*; *waandersi*; New species; *donagheyae*; *germainegreerae*; *mickpitmani*.

INTRODUCTION

The Dog Toothed Cat Snake *Boiga cynodon* (Boie, 1827) from south-east Asia, including western Indonesia (the type locality) has long been suspected by herpetologists as comprising a wide-ranging species complex (e.g. Orlov and Ryabov 2002 or Ramadhan *et al.* 2010).

While found widely in the south-east Asian realm centred on Sundaland, local populations vary significantly.

Ramadhan *et al.* 2010 commenced the breakup of the species complex by formally naming the Nusa Tenggara Islands population as the species *B. hoeseli*.

The diagnosis of this newly named taxon was based on significant and consistent morphological differences.

The basis of this paper is the result of inspection of specimens from across the range of the putative species.

This showed differences in populations, which combined with geographical isolation of each, makes a firm case for recognition of more than one species. In accordance with the *International Code of Zoological Nomenclature* (Ride *et al.* 1999), this paper further divides the putative species *B. cynodon* as currently recognized into four species.

The nominate form from Sumatra and Java includes *B. waandersi* (Bleeker, 1860) from Bali and is treated herein as synonymous to *B. cynodon*.

The other three species formally named for the first time are *B. donagheyae* sp. nov. from Peninsula Malaysia, *B. germainegreerae* sp. nov. from Mindanao Island in the Philippines and *B. mickpitmani* sp. nov. from northern Borneo.

The formal descriptions of each are below, following a proper

diagnosis of *Boiga* Fitzinger, 1826 as currently understood, which includes the diagnoses for the newly named genera, *Dorisius* Hoser, 2012, *Mulvanyus* Hoser, 2012 and *Sloppoiga* Hoser, 2013.

The original description of *Mulvanyus* Hoser, 2012, contained an obvious typographical error.

The relevant part of the description was written:

"*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)."

From the context of the words in the paper, it is clear that the second use of the words "*Mulvanyus* gen. nov." should have been "*Dorisius* gen. nov."

While this is obvious to any reader of the paper, because the corresponding description of "*Dorisius* gen. nov." correctly mirrors this in relevant ways, in view of the nature of claims made by members of the Wüster gang of thieves as they are known, it is prudent that the genus be redescribed herein as new, without the typographical error.

This is to ensure that there is no possible doubt at all, as to the nomenclatural availability of the genus name *Mulvanyus*.

Details of the illegal and dishonest tactics of the Wüster gang, including references to their very creative and improper interpretations of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999) are widespread in the scientific literature and include Hoser (2015a-f) and sources cited therein.

MATERIALS AND METHODS

These are not formally explained in a number of my recent papers under the heading "Materials and methods" or similar, on the basis they are self evident to any vaguely perceptive reader. However, the process by which the following taxonomy and nomenclature in this and other recent papers by myself of similar form (in *Australasian Journal of Herpetology* issues 1-33), has been arrived at, is explained herein for the benefit of people who have recently published so-called "criticisms" online of some of my recent papers. They have alleged a serious "defect" by myself not formally explaining "Materials and Methods" under such a heading.

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

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

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

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

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

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

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

populations.

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

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

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

This means that if a name has been properly proposed in the past, it is used. Alternatively, if no name is available, one is proposed according to the rules of the Code as is done in this paper.

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

The published literature relevant to *Boiga cynodon sensu lato* and the taxonomic and nomenclatural judgements made within this paper includes the following: Auliya (2006), Blackburn (1993), Boie (1827), Brown *et al.* (2013), Bulian (2005), Chanard *et al.* (1999, 2015), Cox *et al.* (1998), Das (2012), David and Vogel (1996), Dowling and Jenner (1988), Duméril *et al.* (1854), Ferner *et al.* (2000), Gaulke (1994, 2001, 2011), Grismer (2011), Groen (2008), Grossmann and Tillack (2001), Hien *et al.* (2001), Hoser (2012, 2013), Lenz (2012), Lidth De Jeude (1922), Lim and Ng (1999), Malkmus *et al.* (2002), Manthey and Grossmann (1997), Mattison (2007), Mertens (1930), Onn *et al.* (2009), Orlov and Ryabov (2002), Orlov *et al.* (2014), Pauwels *et al.* (2000, 2005), Ramadhan *et al.* (2010), Rooijen (2009), Sacha (2015), Sanguila *et al.* (2016), Schmidt (2010), Sharma (2004), Siler *et al.* (2011), Smith (1993), Taylor (1965), Teo and Rajathurai (1997), Teynié *et al.* (2010), Tillack *et al.* (2004), Wallach *et al.* (2014) and sources cited therein.

Some material within descriptions below is repeated for different described taxa and this is in accordance with the provisions of the *International Code of Zoological Nomenclature* and the legal requirements for each description. I make no apologies for this.

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

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

This comment is made noting the extensive increase in human population in south-east Asia and elsewhere and the general environmental destruction across that continent as documented by Hoser (1991), including low density areas without a large permanent human population.

I also note the abysmal environmental record of various National, State and Local governments in the region the past 200 years as detailed by Hoser (1989, 1991, 1993 and 1996).

NOTES ON THE DESCRIPTIONS FOR ANY POTENTIAL REVISORS

Unless mandated by the rules of the *International Code of Zoological Nomenclature*, none of the spellings of the newly proposed names should be altered in any way. Should one or

more newly named taxa be merged by later authors to be treated as a single species or subspecies, the order of priority of retention of names should be the order (page priority) of the descriptions within this text.

SYSTEMATICS

GENUS *BOIGA* FITZINGER, 1826

Type species: *Coluber irregularis* Bechstein, 1802.

Diagnosis: As currently understood *Boiga sensu lato* is a composite group of snakes.

However they are defined as follows:

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.

The genus *Dorisious* Hoser, 2012 are 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* Hoser, 2012).

In *Dorisious* Hoser, 2012 there are 78-110, subcaudals versus over 112 for *Boiga* species (and *Mulvanyus* Hoser, 2012.).

These snakes are unmistakable by their black body with thin, incomplete yellow bands, being orangeish on juveniles, the head is black, the supralabials are yellow with black etching.

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

In line with other *Boiga*, the snakes of this genus 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* (Boie, 1827) including recognized subspecies, however some of the currently recognized subspecies may ultimately prove to be full species.

The genus *Mulvanyus* Hoser, 2012 (or as defined as new below), are separated from snakes of the genus *Boiga* and *Dorisious* Hoser, 2012 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 colours 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.

Slopboiga Hoser, 2013 is readily separated from species within the genus *Boiga* Fitzinger, 1826 as defined herein by having a divided anal and a scarcely enlarged vertebral scale series, as well as very short posterior chin shields and numerous small temporals. The monotypic genus is further defined (and separated from all of *Boiga*, *Dorisious* and *Mulvanyus*) by the following suite of characters: Anterior palatine teeth enlarged; diameter of eye equals its distance from anterior border of

nostril; upper preocular extending to upper surface of the head but separated widely from the frontal; scales in 21 mid body rows, median row scarcely enlarged; ventrals 232-245; anal plate divided; subcaudals 142-143 all divided; posterior chin-shields much shorter than the anterior; temporals 4-5, scale-like and irregular.

BOIGA CYNODON (BOIE, 1827)

Holotype: BMNH 1946.1.2.54 at the Museum of Natural History, London, UK.

Originally described as *Dipsas cynodon* Boie, 1827.

Diagnosis: *Boiga cynodon* and all other species in the complex as defined herein (namely *B. cynodon* from Java, Sumatra, Bali and adjacent islands, *B. donagheyae* sp. nov. from most of Peninsula Malaysia, *B. germaineagreerae* sp. nov. from Mindanao Island in the Philippines and *B. mickpitmani* sp. nov. from northern Borneo), are separated from all other *Boiga* species by the following suite of characters: Anterior palatine teeth are strongly enlarged; posterior chin-shields are larger than the anterior; scales in 23 midbody rows; ventrals 248-290; single anal; 114-156 subcaudals; one preocular, extending to the upper surface of the head; rostral is scarcely visible from above.

B. cynodon is separated from the other species in the complex (*B. donagheyae* sp. nov., *B. germaineagreerae* sp. nov. and *B. mickpitmani* sp. nov.) by the following characters: A post-ocular stripe that is obviously wavy or irregular, versus even or nearly even upper and lower lines in the other species.

While colouration varies, *B. cynodon* is characterised by the following configuration: Yellowish or pale reddish brown above, with dark brown or black transverse spots or cross-bars; a dark postocular streak of irregular thickness on each side of the head, yellowish belly that may be uniform in colour or marbled with brown.

B. donagheyae sp. nov. is separated from the other species in the complex by having 270 or more subcaudals, versus 268 or less in all other species. *B. donagheyae* sp. nov. is further separated from the other species by having a significantly widening (posteriorly) dark post-ocular stripe versus either not or only slightly widening in the other species as well as having significant yellow speckling over the fore and mid body.

While colouration varies, *B. donagheyae* sp. nov. is characterised by the following configuration:

Dark brown or black above, with more or less distinct lighter cross-bars; flanks usually with a series of whitish spots on or close to the ventrals; belly black, or yellowish speckled with black; head is brown above, speckled with black; a black postocular streak on each side of the head behind the eye widening significantly near the back of the head and neck; labials have black vertical lines on the sutures.

B. germaineagreerae sp. nov. is readily separated from the other species in the complex by the lower subcaudal count of 132 or less, versus 142 or more in the other species. Colouration is fawn-colour, without spots or markings, or with traces of darker cross-bands. This colouration is also found in specimens of *B. mickpitmani* sp. nov. from northern Borneo, but they are readily separated by their higher subcaudal count.

Both *B. germaineagreerae* sp. nov. and *B. mickpitmani* sp. nov. are separated from the other two species in the complex by the fact that the dark postocular stripe is even on the boundaries and thin to the rear of the head, as opposed to widening slightly or significantly in the other species. In both species the stripe also runs anterior to the eye, either distinctly in the form of a dark streak or patch, or sometimes by way of an indistinct darkening.

B. mickpitmani sp. nov. can be the same colouration and general colour configuration as either *B. germaineagreerae* sp. nov. or *B. cynodon*. *B. mickpitmani* sp. nov. is separated from *B. germaineagreerae* sp. nov. by the higher subcaudal count, 142 or more, versus 132 or less in *B. germaineagreerae* sp. nov..

B. mickpitmani sp. nov. is separated from *B. cynodon* by having a thin postocular stripe of even thickness and borders, versus a postocular stripe of variable width in *B. cynodon*.

B. donagheyae sp. nov. is separated from *B. mickpitmani* sp. nov. by having 270 or more subcaudals, versus 268 or less in all other species including *B. mickpitmani* sp. nov.. *B. donagheyae* sp. nov. is further separated from the other species (including *B. mickpitmani* sp. nov.) by having a significantly widening (posteriorly) dark post-ocular stripe versus either not or only slightly widening in the other species as well as having significant yellow speckling over the fore and mid body. Such speckling occurs in *B. mickpitmani* sp. nov. but is not prominent beyond the fore-body and is usually far less than seen in *B. donagheyae* sp. nov..

The two species within *Boiga sensu lato* (or predating Hoser 2012) most commonly confused with these above diagnosed species are *Mulvanyus angulatus* (Peters, 1861), from the Philippines, which while superficially similar and presumably sympatric is characterised by 19 midbody rows.

The similar and closely related *Boiga siamensis* Nutaphand, 1971 is separated by having 25 as opposed to 23 dorsal midbody rows. This taxon appears to be allopatric to the other species.

The closely related species *Boiga hoeseli*, Orlov and Ryabov 2002 from the Nusa Tenggara Islands is separated from these (above described species), by the following characters: Body with indistinct bands and not interspaced with narrow bands, 25-27 midbody rows; 256-272 ventrals, 113-134 subcaudals.

Distribution: Java, Bali, Sumatra and nearby islands.

BOIGA DONAGHEYAE SP. NOV.

Holotype: A preserved female specimen at the Museum of Natural History, London, UK, specimen number: BMNH 1886.12.28.23, collected at Malacca, Peninsula Malaysia. It has 270 ventrals and 156 subcaudals.

The Museum of Natural History, London, UK is a facility that allows access to its holdings.

Diagnosis: *Boiga cynodon* and all other species in the complex as defined herein (namely *B. cynodon* from Java, Sumatra, Bali and adjacent islands, *B. donagheyae* sp. nov. from most of Peninsula Malaysia, *B. germaineagreerae* sp. nov. from Mindanao Island in the Philippines and *B. mickpitmani* sp. nov. from northern Borneo), are separated from all other *Boiga* species by the following suite of characters: Anterior palatine teeth are strongly enlarged; posterior chin-shields are larger than the anterior; scales in 23 midbody rows; ventrals 248-290; single anal; 114-156 subcaudals; one preocular, extending to the upper surface of the head; rostral is scarcely visible from above.

B. cynodon is separated from the other species in the complex by the following characters: A post-ocular stripe that is obviously wavy or irregular, versus even or nearly even upper and lower lines in the other species.

While colouration varies, *B. cynodon* is characterised by the following configuration: Yellowish or pale reddish brown above, with dark brown or black transverse spots or cross-bars; a dark postocular streak of irregular thickness on each side of the head, yellowish belly that may be uniform in colour or marbled with brown.

B. donagheyae sp. nov. is separated from the other species in the complex by having 270 or more subcaudals, versus 268 or less in all other species. *B. donagheyae* sp. nov. is further separated from the other species by having a significantly widening (posteriorly) dark post-ocular stripe versus either not or only slightly widening in the other species as well as having significant yellow speckling over the fore and mid body.

While colouration varies, *B. donagheyae* sp. nov. is characterised by the following configuration:

Dark brown or black above, with more or less distinct lighter cross-bars; flanks usually with a series of whitish spots on or

close to the ventrals; belly black, or yellowish speckled with black; head is brown above, speckled with black; a black postocular streak on each side of the head behind the eye widening significantly near the back of the head and neck; labials have black vertical lines on the sutures.

B. germaineagreerae sp. nov. is readily separated from the other species by the lower subcaudal count of 132 or less, versus 142 or more in the other species. Colouration is fawn-colour, without spots or markings, or with traces of darker cross-bands. This colouration is also found in specimens of *B. mickpitmani* sp. nov. from northern Borneo, but they are readily separated by their higher subcaudal count.

Both *B. germaineagreerae* sp. nov. and *B. mickpitmani* sp. nov. are separated from the other two species by the fact that the dark postocular stripe is even on the boundaries and thin to the rear of the head, as opposed to widening slightly or significantly in the other species. In both species the stripe also runs anterior to the eye, either distinctly in the form of a dark streak or patch, or sometimes by way of an indistinct darkening.

B. mickpitmani sp. nov. can be the same colouration and general colour configuration as either *B. germaineagreerae* sp. nov. or *B. cynodon*. *B. mickpitmani* sp. nov. is separated from *B. germaineagreerae* sp. nov. by the higher subcaudal count, 142 or more, versus 132 or less in *B. germaineagreerae* sp. nov..

B. mickpitmani sp. nov. is separated from *B. cynodon* by having a thin postocular stripe of even thickness and borders, versus a postocular stripe of variable width in *B. cynodon* (or significantly wider posteriorly in *B. donagheyae* sp. nov.).

B. donagheyae sp. nov. is separated from *B. mickpitmani* sp. nov. by having 270 or more subcaudals, versus 268 or less in all other species including *B. mickpitmani* sp. nov.. *B. donagheyae* sp. nov. is further separated from the other species (including *B. mickpitmani* sp. nov.) by having a significantly widening (posteriorly) dark post-ocular stripe versus either not or only slightly widening in the other species as well as having significant yellow speckling over the fore and mid body. Such speckling occurs in *B. mickpitmani* sp. nov. but is not prominent beyond the fore-body and is usually far less than seen in *B. donagheyae* sp. nov..

The two species within *Boiga sensu lato* (or predating Hoser 2012) most commonly confused with these above diagnosed species are *Mulvanyus angulatus* (Peters, 1861), from the Philippines, which while superficially similar and presumably sympatric is characterised by 19 midbody rows.

The similar and closely related *Boiga siamensis* Nutaphand, 1971 is separated by having 25 as opposed to 23 dorsal midbody rows. This taxon appears to be allopatric to the other species.

The closely related species *Boiga hoeseli*, Orlov and Ryabov 2002 from the Nusa Tenggara Islands is separated from these (above described species), by the following characters: Body with indistinct bands and not interspaced with narrow bands, 25-27 midbody rows; 256-272 ventrals, 113-134 subcaudals.

Distribution: Known from the region of Malacca, Peninsula Malaysia. It is presumably found in regions north of here to southern Thailand.

Etymology: Named in honour of Kathleen Donaghey a journalist with News Corporation (*Courier Mail*) in recognition to her skills as a journalist in having the courage to report on the eco-terrorist Teri Irwin and her evil "Australia Zoo" business. Few other journalists in Australia have the guts to take on the ruthless Irwin business empire to expose its rotten underbelly. This no doubt is a result of the repeated lies and deception by the Irwin business as well as including when necessary the repeated threats made either by Teri Irwin herself, or more often the thugs induced to act unlawfully on her behalf.

Donaghey has published a number of news reports in the period to 2016 detailing numerous acts of animal cruelty and the like at Teri Irwin's Australia Zoo business on the Sunshine Coast, in

Queensland Australia and/or associated business enterprises (e.g. Donaghey 2015a-c, 2016a-b).

The legacy of Steve Irwin and the business that remains after he died in 2006 when illegally tormenting a stingray in 2006 has been an ongoing wildlife conservation disaster for Australia.

Besides the endemic misinformation that emanates from this business monster, the Irwin family business has very efficiently and effectively sucked up resources and money that would otherwise be earmarked for and given to genuine wildlife conservation enterprises.

These wildlife conservationists now find themselves unable to compete with the fundraising business monster of the Irwin "Wildlife Warriors", related business entities and other similarly placed government owned or backed "zoos" that have copied the same business model.

These enterprises are more into self-promotion than any real wildlife conservation efforts.

By way of example, in 2012 the Irwin's Wildlife Warriors business in the USA received \$31,797 from well-meaning American donors and others, all hoping their money would be spent on wildlife conservation.

Instead the entire amount was paid to the Irwin's staff who raised the money and it was self evident that effectively not a single cent of this money made it to genuine wildlife conservation projects. Papers leaked to the media showed that the relevant employee was paid a salary of \$33,954, which conveniently approximated the earnings of the so-called (largely tax exempt) charity (Donaghey 2016a).

Genuine wildlife conservation efforts by others are in effect being usurped and undermined by commercial shams and scams either run by the Irwin business, or alternatively (and even more seriously) by others now copying the Irwin's "successful" business model.

In the Australian space, the main offenders here include the various government-owned zoo businesses, which are now rebranding themselves as wildlife conservation charities (invariably shams rather than the real thing) and like the Irwin business, getting government wildlife departments to regulate their competitors out of existence.

This is done by the improper creation of excessive and targeted red-tape for the purpose of entrapping victims to breach rules, that may not even be properly defined. If and when this tactic fails the alternative is simply organising illegal armed raids on competitors that have become too successful and risk attracting funds away from the government's own or preferred business (Court of Appeal 2014, VCAT 2015).

Of course the other shocking legacy of the late Steve Irwin, is a general belief that it is perfectly reasonable to torment and attack reptiles and other animals to get them to bite and attack. As a direct result of this, dozens of young snake handlers worldwide have died from venomous snakebites after copying Irwin in the hope of becoming "the next Steve Irwin".

The conservation benefit of this is not only zero, but negative, as every time a young person dies from an avoidable snakebite, governments tend to react by putting more improper rules and restrictions on the majority of law-abiding reptile keepers and handlers who do the right things by both reptiles and other people.

As to why so few people from within the Irwin business speak out about the atrocities that happen in front of them, the reason is in fact very simple. Before one is allowed to work for the business, one is forced to sign a court-enforceable "gag order".

The order itself is probably illegal as the forced signing of the document is unconscionable conduct, but in terms of this particular "gag order" this has not yet been tested in a court of law, as so far, those who have signed such documents have justifiably been afraid to take on the Irwin business by acting in breach of the document's demands.

The document itself is also meant to be "confidential", but one very disgruntled ex-employee of the Irwin business managed to pass a scanned copy of her "confidentiality deed" document to a journalist to view and republish if and when they saw fit to do so and I in turn received a copy.

BOIGA GERMAINEGREERAE SP. NOV.

Holotype: A preserved female specimen in the Museum of Natural History, London, UK, specimen number: BMNH 1877.10.9.63 collected from Mindanao, Philippines. It has 268 ventrals and 132 subcaudals. The Museum of Natural History, London, UK is a facility that allows access to its holdings.

Diagnosis: *Boiga germainegreerae sp. nov.* appears to be the most divergent member of the *Boiga cynodon* species complex. *B. cynodon* and all other species in the complex as defined herein (namely *B. cynodon* from Java, Sumatra, Bali and adjacent islands, *B. donagheyae sp. nov.* from most of Peninsula Malaysia, *B. germainegreerae sp. nov.* from Mindanao Island in the Philippines and *B. mickpitmani sp. nov.* from northern Borneo), are separated from all other *Boiga* species by the following suite of characters: Anterior palatine teeth are strongly enlarged; posterior chin-shields are larger than the anterior; scales in 23 midbody rows; ventrals 248-290; single anal; 114-156 subcaudals; one preocular, extending to the upper surface of the head; rostral is scarcely visible from above.

B. cynodon is separated from the other species in the complex by the following characters: A post-ocular stripe that is obviously wavy or irregular, versus even or nearly even upper and lower lines in the other species.

While colouration varies, *B. cynodon* is characterised by the following configuration: Yellowish or pale reddish brown above, with dark brown or black transverse spots or cross-bars; a dark postocular streak of irregular thickness on each side of the head, yellowish belly that may be uniform in colour or marbled with brown.

B. donagheyae sp. nov. is separated from the other species in the complex by having 270 or more subcaudals, versus 268 or less in all other species. *B. donagheyae sp. nov.* is further separated from the other species by having a significantly widening (posteriorly) dark post-ocular stripe versus either not or only slightly widening in the other species as well as having significant yellow speckling over the fore and mid body.

While colouration varies, *B. donagheyae sp. nov.* is characterised by the following configuration:

Dark brown or black above, with more or less distinct lighter cross-bars; flanks usually with a series of whitish spots on or close to the ventrals; belly black, or yellowish speckled with black; head is brown above, speckled with black; a black postocular streak on each side of the head behind the eye widening significantly near the back of the head and neck; labials have black vertical lines on the sutures.

B. germainegreerae sp. nov. is readily separated from the other species in the complex by the lower subcaudal count of 132 or less, versus 142 or more in the other species. Colouration is fawn-colour, without spots or markings, or with traces of darker cross-bands. This colouration is also found in specimens of *B. mickpitmani sp. nov.* from northern Borneo, but they are readily separated by their higher subcaudal count.

Both *B. germainegreerae sp. nov.* and *B. mickpitmani sp. nov.* are separated from the other two species by the fact that the dark postocular stripe is even on the boundaries and thin to the rear of the head, as opposed to widening slightly or significantly in the other species. In both species the stripe also runs anterior to the eye, either distinctly in the form of a dark streak or patch, or sometimes by way of an indistinct darkening.

B. mickpitmani sp. nov. can be the same colouration and general colour configuration as either *B. germainegreerae sp. nov.* or *B. cynodon*. *B. mickpitmani sp. nov.* is separated from *B. germainegreerae sp. nov.* by the higher subcaudal count, 142 or more, versus 132 or less in *B. germainegreerae sp. nov.*

B. mickpitmani sp. nov. is separated from *B. cynodon* by having a thin postocular stripe of even thickness and borders, versus a postocular stripe of variable width in *B. cynodon* (or significantly wider posteriorly in *B. donagheyae* sp. nov.).

B. donagheyae sp. nov. is separated from *B. mickpitmani* sp. nov. by having 270 or more subcaudals, versus 268 or less in all other species including *B. mickpitmani* sp. nov. *B. donagheyae* sp. nov. is further separated from the other species (including *B. mickpitmani* sp. nov.) by having a significantly widening (posteriorly) dark post-ocular stripe versus either not or only slightly widening in the other species as well as having significant yellow speckling over the fore and mid body. Such speckling occurs in *B. mickpitmani* sp. nov. but is not prominent beyond the fore-body and is usually far less than seen in *B. donagheyae* sp. nov.

The two species within *Boiga sensu lato* (or predating Hoser 2012) most commonly confused with these above diagnosed species are *Mulvanyus angulatus* (Peters, 1861), from the Philippines, which while superficially similar and presumably sympatric is characterised by 19 midbody rows.

The similar and closely related *Boiga siamensis* Nutaphand, 1971 is separated by having 25 as opposed to 23 dorsal midbody rows. This taxon appears to be allopatric to the other species.

The closely related species *Boiga hoesei*, Orlov and Ryabov 2002 from the Nusa Tenggara Islands is separated from these (above described species), by the following characters: Body with indistinct bands and not interspaced with narrow bands, 25-27 midbody rows; 256-272 ventrals, 113-134 subcaudals.

Distribution: Known from Mindanao Island in the Philippines, but presumably also found on most of the major islands in the archipelago.

Etymology: Named in honour of Germaine Greer (born 29 January 1939). She is best known as an Australian-born writer, regarded as one of the major voices of the second-wave feminist movement in the latter half of the 20th century. As of 2016 she lives in the United Kingdom, where she has held academic positions, specializing in English literature, at the University of Warwick and Newnham College, Cambridge. She is also an avid wildlife conservationist.

At the time of the death of police-protected criminal and animal tormentor Steve Irwin in 2006, she took on the financial might of the Irwin family business by correctly blaming Irwin for his own death via a media column (Greer 2006).

For this action, she copped hatred and abuse from the Irwin business and those trolls acting on their behalf on social media via a massive number of questionable accounts.

Her comments at the time, written in a blog, were among the few true comments the tabloid media printed at the time (Greer 2006).

Elsewhere the friends of the politically well-connected Steve Irwin in the media and elsewhere eulogised about the apparent freak death of Steve Irwin, whom they recklessly mislabelled a wildlife conservationist.

This lie has been built on by Teri Irwin, Irwin's father, Bob Irwin and the Australia Zoo business in the decade since his death, even though most of what Steve Irwin did was anti-conservation in every sense of the word.

Correctly in her blog in 2006, Greer wrote:

"As a Melbourne boy, Irwin should have had a healthy respect for stingrays, which are actually commoner, and bigger, in southern waters than they are near Port Douglas, where he was killed. The film-makers maintain that the ray that took Irwin out was a "bull ray", or *Dasyatis brevicaudata*, but this is not usually found as far north as Port Douglas. Marine biologist Dr Meredith Peach has been quoted as saying, "It's really quite unusual for divers to be stung unless they are grappling with the animal and, knowing Steve Irwin, perhaps that may have been the case." Not

much sympathy there then ...

There was not an animal he (Steve Irwin) was not prepared to manhandle. Every creature he brandished at the camera was in distress. Every snake badgered by Irwin was at a huge disadvantage, with only a single possible reaction to its terrifying situation, which was to strike. Easy enough to avoid, if you know what's coming. Even my cat knew that much. Those of us who live with snakes, as I do with no fewer than 12 front-fanged venomous snake species in my bit of Queensland rainforest, know that they will get out of our way if we leave them a choice. Some snakes are described as aggressive, but, if you're a snake, unprovoked aggression doesn't make sense. Snakes on a plane only want to get off. But Irwin was an entertainer, a 21st-century version of a lion-tamer, with crocodiles instead of lions.

...

The animal world has finally taken its revenge on Irwin, but probably not before a whole generation of kids in shorts seven sizes too small has learned to shout in the ears of animals with hearing 10 times more acute than theirs, determined to become millionaire animal-loving zoo-owners in their turn."

Greer has in her 2006 editorial that corrected the historical record on the evil monster Steve Irwin made a significant contribution to wildlife conservation globally.

In the context of Australia, she had the courage to speak out against the Irwin business monster at a time when everyone else in the wildlife space was too scared and intimidated to speak out.

This was due to a very real fear that the Irwins may get mates in the Australian government to do a potentially illegal armed raid on them, fabricate criminal charges or the like, all which had become a hallmark of the way that Steve Irwin and his business did things.

BOIGA MICKPITMANI SP. NOV.

Holotype: A preserved specimen in the Museum of Natural History, London, UK, specimen number: BMNH 1887.2.7.20 collected from Sarawak, Borneo. It has 261 ventrals and 143 subcaudals. The Museum of Natural History, London, UK is a facility that allows access to its holdings.

Diagnosis: *Boiga cynodon* and all other species in the complex as defined herein (namely *B. cynodon* from Java, Sumatra, Bali and adjacent islands, *B. donagheyae* sp. nov. from most of Peninsula Malaysia, *B. germainegreerae* sp. nov. from Mindanao Island in the Philippines and *B. mickpitmani* sp. nov. from northern Borneo), are separated from all other *Boiga* species by the following suite of characters: Anterior palatine teeth are strongly enlarged; posterior chin-shields are larger than the anterior; scales in 23 midbody rows; ventrals 248-290; single anal; 114-156 subcaudals; one preocular, extending to the upper surface of the head; rostral is scarcely visible from above.

B. cynodon is separated from the other species in the complex by the following characters: A post-ocular stripe that is obviously wavy or irregular, versus even or nearly even upper and lower lines in the other species.

While colouration varies, *B. cynodon* is characterised by the following configuration: Yellowish or pale reddish brown above, with dark brown or black transverse spots or cross-bars; a dark postocular streak of irregular thickness on each side of the head, yellowish belly that may be uniform in colour or marbled with brown.

B. donagheyae sp. nov. is separated from the other species by having 270 or more subcaudals, versus 268 or less in all other species. *B. donagheyae* sp. nov. is further separated from the other species by having a significantly widening (posteriorly) dark post-ocular stripe versus either not or only slightly widening in the other species as well as having significant yellow speckling over the fore and mid body.

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Distribution: Northern Borneo in or near hillier regions.

Etymology: Named in honour of Australia's original "Crocodile Hunter" Mick Pitman, after whom the hit movie "Crocodile Dundee" was modelled. Pitman's successful crocodile conservation business based in Queensland was effectively destroyed by a business rival named Steve Irwin.

A police-protected criminal and shrewd businessman, Steve Irwin cultivated a close relationship with corrupt government officials who acted as his paid thugs to repeatedly engage in illegal armed raids of Pitman's home and business in order to shut him down.

Irwin also effectively stole his (at the time unregistered) common-law trademark by quietly applying for registration of it (in two classes) on 2 September 1998, via IP Australia through a

family connected business. After obtaining registration for the trademarks (unopposed), Irwin then took action to stop Pitman using the name for himself.

Once Pitman was prohibited from trading as "the Crocodile Hunter", the result being that business was instead channelled to the Irwin enterprise and in the face of non-stop illegal armed raids (including more than 26 in two years) at Steve Irwin's instigation, Pitman had to completely shut down his enterprise and move to the Northern Territory, in effect as a fugitive.

While Irwin ended up making many millions of dollars through government hands-outs to his family business in cash or in kind and became famous globally for his on-TV acts of extreme animal cruelty and abuse, Pitman was forced to languish in poverty and obscurity.

Other dedicated wildlife conservationists who had their businesses shut down following illegal armed raids instigated by Steve Irwin included Robert (Bob) Buckley of Herberton in Queensland and Bob Withey of Niagra Park, New South Wales (see Hoser, 1996 for details).

Employees and former employees of the Australia Zoo business who were disgusted with the animal cruelty and other potentially illegal practices at the Australia Zoo did not speak out publicly and for good reason.

Based on the well-known case of Mick Pitman, there was a very real fear of serious reprisals for anyone who dared to speak out.

Securing the silence of all employees and former employees was a contract signed by all employees demanding silence on such matters. This "Confidentiality Deed" demanded of all potential employees, contractors and the like to be signed before they commenced with the zoo meant that they were effectively prohibited from speaking out publicly about anything at any time (Nolan 2008).

Besides the knowledge of the very real likelihood of police raids or charges should they speak out, this "Confidentiality Deed" guaranteed a lifetime of financial ruin for anyone who transgressed.

Significantly and not widely known, is that such a "Confidentiality Deed" as also demanded by most government owned zoos in Australia, are themselves highly illegal, as the demanding of them to be signed is what is called "unconscionable conduct". "Unconscionable conduct" is where a big business or government authority demands a manifestly unfair agreement or contract of a weaker party, including in the context of an offer of paid employment.

Karma kicked in for Steve Irwin on 4 September 2006, when after illegally mistreating and abusing a stingray, Irwin was killed by its tail barb that penetrated his chest (Greer 2006).

Following his death, Irwin's family attempted to re-write history by alleging Steve Irwin had been a tireless wildlife conservation icon. In fact nothing could have been further from the truth!

By diverting well meaning people's donations from other wildlife charities to his own business enterprise, Irwin directly contributed to the declines of and potential extinctions of many animal species.

The so-called conservation charities of the Irwin business were more into self-promotion than any real wildlife conservation efforts.

By way of example, in 2012 the Irwin's Wildlife Warriors business in the USA received \$31,797 from well-meaning American and other donors.

No doubt the donors all hoped their money would be spent on wildlife conservation.

Instead the entire amount was paid to the Irwin's staff who raised the money and it was self evident that effectively not a single cent of this money made it to genuine wildlife conservation projects. Papers leaked to the media showed that the relevant employee was paid a salary of \$33,954, which conveniently approximated the earnings of the so-called (largely

CONFIDENTIALITY DEED



Home of The

Crocodile Hunter V



AUSTRALIA ZOO • Whale Encounters • WILDLIFE

THE PARTIES:

- 1. SILVERBACK STAFF SERVICES PTY LTD or AUSTRALIA ZOO WILDLIFE WARRIORS WORLDWIDE LTD or AUSTRALIA ZOO TRAVEL PTY LTD or AUSTRALIA ZOO ADVENTURE CRUISES PTY LTD

Of Steve Irwin Way WARRIORS Beerwah, Queensland 45 19 Australia ("Company")

- 2. NAME:

ADDRESS:

POSITION: Employee

(Employee/volunteer/individual) ("Individual")

The Individual will have disclosed to him/her Confidential Information in the course of their engagement at the Company

IT IS AGREED:

1. In this Deed "Confidential Information" includes but is not limited to all information acquired by the Individual in the course of his/her engagement with the Company including the communications and discussions amongst the Company's staff and personnel and the business affairs of the Company. It is expressly acknowledged that the Individual may witness discussions and otherwise be privy to communications between personnel who manage or work at the Company and principals of the Company and all these conversations and communications are to similarly be treated as "Confidential Information".

- 2. The Individual agrees that he/she shall:

(a) not divulge or disclose to any person (whether directly or indirectly) the "Confidential Information" without the Company's prior written permission;

(b) take all reasonable precautions to prevent disclosure of the "Confidential Information" to third parties;

(c) not make any use whatever of the "Confidential Information";

(d) At the conclusion of any services rendered by the Individual or otherwise on request by the Company immediately deliver to the Company all documents and materials (and all copies) comprising and/or relating to the "Confidential Information".

DULY EXECUTED BY THE PARTIES AS A DEED

on (Date) 20/10/08

DULY EXECUTED BY

AUSTRALIA ZOO PTY LIMITED or WILDLIFE WARRIORS WORLDWIDE LTD or AUSTRALIA ZOO TRAVEL PTY LTD or AUSTRALIA ZOO ADVENTURE CRUISES in accordance with its Constitution in the presence of:

Witness Signature

BONNIE NOLAN Witness Name

"Conservation exciting education"

[Signature]

through

AUSTRALIA ZOO Pty Ltd. ACN 082 960 521 ABN 94 754 5 10 279 Tel: +61 7 5436 2000 Fax: +61 7 5494 8604 Steve Irwin Way, Beerwah, Qld, 45 19 AUSTRALIA Info@australiazoo.com.au www.australiazoo.com.au

tax exempt) charity (Donaghey 2016a), thereby allowing the Irwin enterprise to claim a tax loss and claw back more money from the government.

The lizard genus *Pitmansaurus* Hoser, 2014 is also named in honour of Mick Pitman (Hoser, 2014).

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 *Dorsisous* Hoser, 2012 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 colours 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.

Slopboiga Hoser, 2013 has a divided anal as opposed to single in *Mulvanyus gen. nov.*

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 honour 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)

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CONFLICT OF INTEREST

The author has no known relevant conflicts of interest.