Further division of the tree snake genus *Dendrelaphis* Boulenger, 1890, including the erection of three new genera to accommodate divergent species groups (Serpentes: Charlespiersonserpeniidae).

RAYMOND T. HOSER

488 Park Road, Park Orchards, Victoria, 3114, Australia.

*Phone: +61 3 9812 3322  Fax: 9812 3355  E-mail: snakeman@snakeman.com.au*

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ABSTRACT

The tree Snake genus *Dendrelaphis* Boulenger, 1890 as recognized at the beginning of year 2012 had long been recognized as a diverse group (McDowell 1984). Hoser (2012), commenced the dismemberment of the genus as widely known by removing several distinctive Australasian species and placing them in the new genus *Charlespiersonserpens*. Hoser 2013 went further and created a new family *Charlespiersonserpeniidae* to accommodate the Colubroid snake genera *Charlespiersonserpens* Hoser, 2012, *Dendrelaphis* Boulenger, 1890, *Chrysopelea* Boie, 1826 and *Ahaetulla* Link, 1807, in turn placed within tribes.

Phylogenies published by Pyron et al. (2013a, 2013b) provided molecular evidence in support of the Hoser (2012 and 2013) divisions of *Dendrelaphis* and the higher level taxonomy as well as other earlier morphological studies (e.g. Boulenger 1890).

This paper now takes the next logical step in the dismemberment of the genus *Dendrelaphis* and removes divergent Asian species groups from *Dendrelaphis sensu lato* creating three new genera, namely *Dannycoleus* gen. nov. for the bifrenalis group, *Shaneblackus* gen. nov. for the pictus group and *Brucegowus* gen. nov. for the caudolineolatus group, all placed within the tribe *Charlespiersonserpenini* Hoser, 2013.

Keywords: Taxonomy; Tree Snakes; Charlespiersonserpeniidae; Charlespiersonserpenini; Dendrelaphis; Charlespiersonserpens; new genera: Dannycoleus; Brucegowus; Shaneblackus.
pictus group and Brucegowus gen. nov. for the caudolineatus group, all placed within the tribe Charlepiersonserpeni Hoser, 2013, with all defined according to the Zoological Code (Ride et al. 1999).

Along with the genera Dendrelaphis and Charlepiersonserpens, these are all placed within the tribe Charlepiersonserpeni Hoser, 2013 as defined by Hoser (2013).

Hoser (2012) provided an extensive list of references relevant to the snakes of the genus Dendrelaphis sensu lato and their taxonomy, including the newly erected genus Charlepiersonserpens.

Although it has already been inferred that molecular data of Pyron et al. (2013) supports the erection of the three genera as defined below, I should note that the genera are defined solely on the basis of morphological divergence rather than any phylogenies produced on the basis of molecular data.


GENUS DENDRELAPHIS BOULENGER, 1890

Type species: Ahaetulla caudolineata Gray, 1834.

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

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

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

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

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

At the genus level the group has been relatively stable in recent years in spite of the growing number of named species. The type species, the Striped Bronzeback Dendrelaphis caudolineatus (Gray, 1834) is physically quite different from the Australia/New Guinea species, being of obviously thinner build and glossier scalation.

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

As a result of these obvious differences, seven Australia/New Guinea species, were placed in the newly created genus for all seven species called Charlepiersonserpens Hoser, 2012.

Three of these species were further placed within newly named subgenera, one subgenus Downieea Hoser, 2012 included one species papuensis, while the other subgenus, Macmillanus Hoser, 2012 included the species lorentzi and a newly described congener, Charlepiersonserpens (Macmillanus) jackyhoserae Hoser, 2012.

Hoser, 2012, stated “Dendrelaphis as herein recognized is certainly composite and warranting further divisions in the subgenus level”. This paper moves further in this regard, choosing to give full generic status to the three groups named herein.

The remaining content of the genus Dendrelaphis is given below after the descriptions of the other new genera. It is a genus of snakes distributed in Southern Asia and nearby. That assemblage is also likely to be further divided with groups within it requiring further taxonomic recognition.

GENUS CHARLEPIERSONSERPENS HOSER, 2012

Type Species: Leptophis punctulatus Gray, 1826

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

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

Snakes within the genus Dendrelaphis have a higher average ventral count than seen in this genus Charlepiersonserpens Hoser, 2012.

Furthermore for snakes within the genus Dendrelaphis only the fourth supralabial makes contact with the eye, with numbers 5 and 6 merely coming close, as opposed to the configuration given above for Charlepiersonserpens Hoser, 2012.

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

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

Content: Charlepiersonserpens punctulatus (Gray, 1826) (type species); C. calligastera (Günther, 1867); C. gastrosticus (Boulenger, 1894); C. (Macmillanus) jackyhoserae Hoser, 2012; C. (Macmillanus) lorentzi (Lidith De Jeude, 1911); C. (Downieea) papuensis (Boulenger, 1895); C. salomonis (Günther, 1872).
**Dannycoleus gen. nov.**

Type species: *Dendrophis bifrenalis* Boulegon, 1890.

**Diagnosis:** This genus *Dannycoleus gen. nov.* is readily separated from other similar species by having a double loreal shield, which is unique within the tribe Charlepiersonserpenini. These species are also separated from all other *Dendrelaphis* species (as diagnosed herein), excluding *Shaneblackus gen. nov.* (see below) by having a red colored tongue, which is not the case in all other species in the tribe Charlepiersonserpenini. The genus *Dannycoleus gen. nov.* is readily separated from *Shaneblackus gen. nov.* (see below) by having a noticeably more elongate head as well as the fact that in *Dannycoleus gen. nov.* the whole side of the ventrals above the lateral keel is a dark olive color like on the back. *Dannycoleus gen. nov.* is also diagnosed as follows: Cylindrical, narrow, slender body is present with a dorso-ventrally flattened pear shaped head. The neck region is clear and distinct. The snout is long and compressed and the tip is broad and rounded. The nostrils are laterally oriented and rounded in shape. The pupil is round and the eyes large. Parietals are longer than the frontal, two loreals, nine upper labials, numbers five and six entering the eye; 154-171 ventrals, divided anal and 144-155 divided subcaudals.

The prehensile tail is 1/3 of the total length of the snake. Dorsally the snake is a copper color. The top of the labials and chin are a cream or light green color. There is a black broad bar at the sides of the head and these run along the eye to the neck region. The lateral corner of the anterior body has black cross strips in a diagonal angle. Two yellow lines run on the lateral sides of the body. Sometimes these lines may be margined by black dots. Ventrally the colour is a yellowish green. Adult snakes grow to about 700-900mm total length. There are 15 dorsal mid-body rows of scales. The vertebrals are clear and enlarged and larger than the outer row.

**Distribution:** Sri Lanka and possibly southern India.

**Etymology:** Named in honour of Shane Black, a reptile keeper, formerly of Malabar in Sydney, New South Wales, Australia and more recently of Queensland in recognition of his excellent work keeping and breeding large numbers of the larger species of Australian elapid snakes, including Coastal Taipans (*Oxyuranus scutellatus*) and Inland Taipans (*Parademansia microlepidota*).

A search warrant was executed on an inexperienced snake handler, named Bryan Grieg Fry in Melbourne, Victoria, by government wildlife officers employed by the Department of Sustainability and Environment (DSE) as the department was then known. The officers had evidence of illegal activity relating to alleged wildlife trafficking and illegal keeping by Fry and his closest associates.

According to wildlife officers Fry sought to avoid charges by acting as an informant on others.

One of the people Fry provided ‘evidence’ about was Shane Black (as well as several others).

Search warrants were executed simultaneously on these people, including Black at his NSW address.

The raid by officers of the NSW National Parks and Wildlife Service (NPWS) not only caused the break up and destruction of Black’s top-class breeding facility in NSW, but also the end of his marriage and the premature death of his then former wife, this combined outcome being a direct result of the sequence of events precipitated by Fry.

Black fled the NSW NPWS harassment and moved to Queensland in order to conduct his herpetological activity which continues as of mid 2013.

Meanwhile the informant in the matter, Bryan Fry was tipped off about pending charges against him by DSE officers in Victoria and so he too went to Queensland in order to avoid being charged (Thys 2013), with a statute of limitations on the matters being 24 months.

**Shaneblackus gen. nov.**

Type species: *Coluber pictus* Gmelin, 1789.

**Diagnosis:** *Shaneblackus gen. nov.* is diagnosed and separated from all other *Dendrelaphis* (and including *Dannycoleus gen. nov.*), *Brucegowus gen. nov.* and *Charlepiersonserpenina* Hoser, 2012 as follows: The maxillary teeth number from 23 to 26, the eye is as long as the distance between the nostril and eye. The prehensile tail is half the length as the snout-vent.

**Distribution:** Shaneblackus gen. nov. is known from Southern Asia, from India to southern China and south to include the Philippines and most of Indonesia, including both sides of Malaysia.

**Etymology:** Named in honour of Shane Black, a reptile keeper, formerly of Malabar in Sydney, New South Wales, Australia and more recently of Queensland in recognition of his excellent work keeping and breeding large numbers of the larger species of Australian elapid snakes, including Coastal Taipans (*Oxyuranus scutellatus*) and Inland Taipans (*Parademansia microlepidota*).

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**Brucegowus gen. nov.**

Type species: *Dendrophis caudolineolatus* Günther, 1869.

**Diagnosis:** *Brucegowus gen. nov.* is separated from all other snakes in the genus *Dendrelaphis* and the tribe Charlepiersonserpenini as diagnosed herein (and/or by Hoser, 2012) by the following suite of characters: A cylindrical, narrow, slender body is present with a dorso-ventrally flattened pear shaped head. The neck region is clear. The snout is long and compressed and the tip of it is broad and rounded. The nostrils are laterally oriented and rounded. A round pupil is present in large eyes. The prehensile tail is half the length as the snout-vent. Maxillary teeth 29-32, posterior largest; snout broadly rounded; colouration is olive or brown above with a yellow lateral stripe, bordered below by a dark line between the outer scales and the ventrals. A black temporal stripe on each side of the head passes through the eye, widens or breaks up into spots, separated by bluish-green bands on the nape. The upper lip is yellow and the lower surface yellowish or greenish. In common with *Dannycoleus gen. nov.* there is a red colored tongue. However the genus *Dannycoleus gen. nov.* is readily separated from other similar species of Charlepiersonserpenini by having a double loreal shield, which is unique within the tribe Charlepiersonserpenini.

In Shaneblackus gen. nov. the snout-vent may get up to about 740 mm and the tail up to 440 mm.

**Distribution:** Shaneblackus gen. nov. is known from Southern Asia, from India to southern China and south to include the Philippines and most of Indonesia, including both sides of Malaysia.

**Etymology:** Named in honour of Shane Black, a reptile keeper, formerly of Malabar in Sydney, New South Wales, Australia and more recently of Queensland in recognition of his excellent work keeping and breeding large numbers of the larger species of Australian elapid snakes, including Coastal Taipans (*Oxyuranus scutellatus*) and Inland Taipans (*Parademansia microlepidota*).
eye as long as its distance from the anterior border of the nostril; internasals shorter than the prefrontals; temporals 1+2; 8 supralabials, 4th and 5th touching the eye; vertebrae freebly enlarged, at mid-body narrower than the outer row of scales, the posterior margin rounded or truncate. Scales in 13:13:9 rows. 149 ventrals, divided anal and 119-128 divided subcaudals. The coloration is as follows: Dorsally bronze-olive or bronze-orange with the forehead pale green. The anterior of the body has oblique black streaks with a narrow temporal stripe. On top of this stripe is a bronze-brown colour and the lower part is cream colour. Ventrally the body is grey or pale green. The last few ventral scales and the subcaudals have a black stripe running towards the tail and this is unique for the genus Brucegowus gen. nov. in terms of other snakes in the tribe Charlepiersonserpenini.

**Distribution:** Sri Lanka and India.

**Etymology:** Named in honour of Bruce Gow, licenced plumber of Park Orchards (outer Melbourne), Victoria, Australia, in recognition for important logistical work at the Snakebusters reptile facility. Gow has over more than a decade assisted on call to maintain the facility which includes crocodile cages and the like with all the usual plumbing paraphernalia. Without his services, we would have been unable to care for the animals properly and of course they are an essential part of the reptile education shows done by Snakebusters in Australia.

In other words, Gow has made an essential contribution to the education of Australians about wildlife and contributed to their conservation.

As with a lot of other tradespeople who build and maintain zoos and other facilities, Gow is one of an army of unsung heroes who assist in the wildlife conservation effort.

**Content:** Brucegowus caudolineolatus ( Günther, 1869) (type species); B. effrenis (Wall, 1921).

**SPECIES REMAINING WITHIN THE GENUS DENDRELAPHS BOULENGER, 1890**

Dendrelaphis caudolineatus (Gray, 1834) (type species); D. ashoki Vogel and Van Rooijen, 2011; D. biloreatus Wall, 1908; D. caudolineatus (Gray, 1834); D. chaiarecaeos (Boie, 1827); D. formosus (Boie, 1827); D. grandoculis (Boulenger, 1890); D. grismeri Vogel and Van Rooijen, 2006; D. hollrankel Lazell, 2002; D. humayuni Tiwari and Biswas, 1973; D. kopstieni Vogel and Van Rooijen, 2007; D. levitoni Van Rooijen and Vogel, 2012; D. marenae Vogel and Van Rooijen, 2008; D. oliveri (Taylor, 1950); D. schokari (Kuhl, 1820); D. subocularis (Boulenger, 1888); D. tristis (Daudin, 1803); D. underwoodi Vogel and Van Rooijen, 2011; D. walli Vogel and Van Rooijen, 2011.

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