
On the nomenclature and taxonomy of the south Indian colubrid snake *Ahaetulla perroteti* (Duméril, Bibron & Duméril, 1854)

S.R. GANESH^{1,2} and S.R. CHANDRAMOULI¹

¹ Dept. of Zoology, Divn. of Wildlife Biology, A.V.C. College, Mannampandal, Mayiladuthurai 609 305, Tamil Nadu, India.

² Corresponding author: snakeranglerr@gmail.com

THE vine snake *Ahaetulla perroteti* (Duméril, Bibron & Duméril, 1854) is endemic to the Western Ghats mountain range of southern India, with precise distribution records from North Canara (Jerdon, 1854), Nilgiris (Theobald, 1868; Wall, 1919; Kannan & Bhupathy, 1996), Silent Valley (Balakrishnan, 2007), High Wavys (Hutton, 1949; Hutton & David, 2009), Periyar Tiger Reserve (Zacharias, 1997), Kalakkad-Mundanthurai Tiger Reserve (Kumar et al., 2001; Ishwar et al., 2001), Eravikulam, Coorg, and Courtallam (Anonymous, 2001). Apart from these, an erroneous record from Pegu in Burma [now Myanmar] also exists (Sclater, 1891). Although all these localities are present in the Western Ghats they have varying habitats and topography. North Canara has evergreen and semi-evergreen forests covering its low hills, rising rarely over 700 m asl (Ali, 2006) while all other above mentioned localities, in the Southern Western Ghats, i.e., N 8-11° have montane shola grassland habitat covering high hills raising over 1500 m asl (Lockwood, 2006; Shanker, 1997).

A. perroteti has not been recorded from North Canara except for the holotype of its subjective synonym *Leptophis canarensis* Jerdon "1853" 1854 and some implicit reports (for example, Günther, 1864). Field surveys conducted in North Canara (Ali, 2006; Ganesh et al., 2007) failed to record the snake. Its micro-and meso-habitat associations are also unequivocal in literature. Wall (1919) and Kannan & Bhupathy (1996) remark that the species is common on the grassy hills of Nilgiris, while Kumar et al. (2001) and Ishwar et al. (2001) document sightings of *A. perroteti* in the rainforests of Kalakkad-Mundanthurai Tiger Reserve. Their opinions were concurred by Anonymous (2001) who stated the species to be arboreal, inhabiting evergreen forests.

Due to inconsistencies in the occurrence of this snake we herein report data based on field observations of four male and two female live conspecifics sighted from 14 to 18 June 2008 in Mukurthi National Park (N 11°20.44', E 76°33.22'; 2200-2250 m asl), Nilgiri district, Tamil Nadu state, India.

MATERIALS AND METHODS

Visual encounter surveys (Crump & Scott, 1994) was used to collect basic ecological data in the field. Meristic, metric and morphological data were recorded from live individuals in-situ and all snakes were released after data collection. Scale counts were taken following Ganesh et al. (2009), using a magnifying hand lens. Measurements were taken using a standard measuring tape and the values reported to the nearest millimetre. Sex was determined using a thin, smooth, metallic probe. All photographs of the snake were taken in life and in-situ, using a Canon Powershot A620™ camera. Geographic coordinates and altitude of sighting localities were recorded using a Garmin™ 12 channel GPS. Nomenclatural discussions strictly comply with the 4th edition of the International Code of Zoological Nomenclature, ICZN (1999).

OBSERVATIONS

Morphology

Pupil horizontally elongate; rostral scale without dermal appendage; loreal absent; supralabials 8, 4th and 5th entering orbit; infralabials 8, 1st-5th touching genials; internasals and prefrontals in contact with supralabials; preocular 1, reaching the upper surface of head; loreal region strongly concave, ridged above with a notch of preocular and prefrontal scales; postocular 1; temporals 2+2; scales in 15:15:13 oblique rows, sacral scales

keeled, more so in males; vertebral scalerow not enlarged; prefrontals 1-2; ventrals, males: 133-137, females: 147-156, angulate laterally, bicarinate; subcaudals, males: 63-79, females: 59-63 pairs excluding terminal scale; anals 2; snout to vent length, males: 224-323 mm, females: 484-512 mm; tail length, males: 86-125 mm, females 152-160 mm; relative tail length males: 27-28%, females: 23%; in life colour, males: light or pale green to greenish yellow, females: brownish orange or brownish ochre, with a pale lateral stripe along the outermost scale rows (Fig. 1).

Field Observations

These snakes were actively moving around during daytime (09:30-15:45), on grassland, bare ground and the floor of old, dilapidated buildings. Two adults, a male and female, were once observed together in accompaniment, on bare ground near a tar road surrounded by pinewood plantations and grassland patches with pockets of shola forests in between (Fig. 1). Four specimens were found on the ground and two were found about 1-2 feet above ground, on rocks but not on plants or trees. We observed the snakes to be thermophilic, basking during sunny times of the day. Our searches within tree-cover, both in shola forests, as well as man-made plantations, failed to yield any sightings.

DISCUSSION

Our field observations on the natural history of this species agree with Wall (1919) and Kannan & Bhupathy (1996), in that, this species is common on the montane grasslands of the Nilgiris. Morphological data of our specimens are, for the most part, consistent with, though slightly outranging the features given in historical literature (Günther, 1864; Boulenger, 1890; Wall, 1919; Smith, 1943). Our ventral counts were 133-156 (vs. 136-146 in Smith [1943]; 137-146 in Wall [1919]) and our subcaudal counts were 63-79 in males (vs. 65-75 in Smith [1943]; 71-81 in Wall [1919]), 59-63 in females (vs. 71-86 in Smith [1943]; 65-75 in Wall [1919]). From these data, it is apparent, that Smith (1943) had, possibly by mistake, interchanged the subcaudal counts (largely based on Wall [1919]) of the males measured, with the females. We believe that this factor likely accounts

for the large difference in the subcaudal counts of our measurements that are more consistent with that reported in Wall (1919). We also report the largest length for this species: 670 mm (vs. < 590 mm in Wall [1919]). Literature (Günther, 1864; Boulenger, 1890; Wall, 1919; Smith, 1943) states the life colour of this species to be green. Our observations and photographic vouchers reveal the presence of a predominantly brown coloration in females. These vouchers are, to the best of our knowledge, the first published photographs for this species, illustrating it in life and in natural habitat. Thus we slightly expand the characterisation of this species, by providing intraspecific variation from novel conspecifics. Even after Wall (1919) extensive data on scalation, dentition, morphology, natural history, breeding, habitat associations, and a good sample size of 57 specimens, there is still much more to reveal with *A. perroteti* than previously realised.

Of all the congeners, *A. perroteti* has the smallest relative tail length (0.24 in *A. perroteti* vs. 0.31 in *A. fronticincta*; 0.33 in *A. dispar*; 0.34 in *A. prasina*; 0.38 in *A. nasuta*; 0.41 in *A. pulverulenta*) and subcaudal scale counts (65-86 in *A. perroteti* vs. 78-119 in *A. dispar*; 139-148 in *A. fronticincta*; 135-180 in *A. nasuta*; 141-192 in *A. prasina*; 151-208 in *A. pulverulenta*); data from Smith [1943] and Whitaker & Captain [2004]). Considering the above data it is reasonably clear that the morphology of *Ahaetulla perroteti* is inconsistent with the rest of its long-tailed congeners. This view was also concurred by Jerdon (1854) and Günther (1858). The short and stocky habitus could be the result of environmental selection pressures (see Aubert et al., 2004). To add more support, we provide literature accounts on “terrestrial” behaviour of some “arboreal” *Ahaetulla* spp. Whitaker & Captain (2004) state that *A. nasuta* is mainly arboreal but rarely found on the ground and further state that it has been observed feeding on fish, tadpoles and shield-tail snakes, all of which support terrestrial behaviour. Such terrestrial behaviours exhibited by *A. nasuta* could perhaps be considered as facultative traits. However, since our surveys revealed that *A. perroteti* was never found on branches of shrubs and trees but always on bare, open grasslands, *A. perroteti* could be regarded as

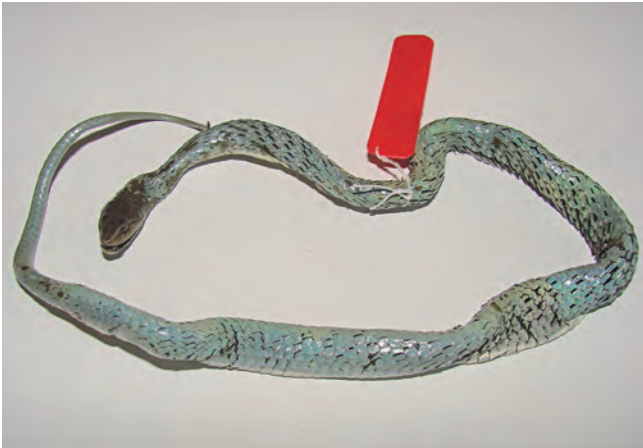


Figure 1. (from top left to bottom right) - live adult male; live adult female *Ahaetulla perroteti*; holotype MNHN 1994.1074 (photo courtesy: Patrick David); map of southern India showing Nilgiris and North Canara; topography of upper Nilgiris (Mukurthi National Park); topography of North Canara (Sharavathy Wildlife Sanctuary).

an obligate terrestrial snake, until further arboreal observations confirm its habitus. Despite being a member of a genus comprising primarily arboreal taxa, its unique, short and stout build, together with complete absence of any dermal protuberance on the rostrum are perhaps regarded as adaptive traits to the open grassland environments that it uses. This situation parallels that of some other shola grassland-dwelling taxa which are supposed to be "arboreal" like the rhacophorid frogs *Ghatixalus* spp. and *Raorchestes resplendens* that are in fact terrestrial (Biju et al., 2008; 2010).

Taxonomy and Status of *Leptophis nilagiricus*

Günther (1864), whilst writing the accounts of *Ahaetulla perroteti*, stated: "*Judging by the figure in W. Elliot, Esq., the "Leptophis? nilagiricus?" n. sp. of Jerdon's Journ. As. Soc. Beng. xxii. p. 529 would belong to this genus. The celebrated Indian ornithologist describes it thus: Green above, yellow beneath; ventrals 140, subcaudals 73, thirteen rows of scales. Very common on the grassy hills of Neelgherries.*"

Our perusal of Jerdon (1854) revealed that the original description of *Leptophis nilagiricus* contained just these two lines quoted above, and is not clearly informative. *Leptophis nilagiricus* Jerdon, 1854 "1853" currently meets the conditions of Article 11.9 of the International Code of Zoological Nomenclature, ICZN (1999) (hereafter, "the Code") as an available name. In order to assess the status of this nominal taxon *Leptophis nilagiricus* Jerdon, 1854 we first analysed the taxonomic history of *Ahaetulla perroteti*, the valid species with which this nominal taxon was originally associated with by Günther (1864).

The taxonomic history of *A. perroteti* is fraught with several issues. Duméril et al. (1854) described *Psammophis perroteti* based on a single specimen from "Indes Orientales". Jerdon ("1853"1854) described *Leptophis? canarensis?* based on a single specimen originating from "North Canara" (now Uttar Kannada district of Karnataka state, India). Günther (1858) described *Dryophis tropidococcyx* based on several syntypes from "Madras", "India" and "East Indies".

Günther (1858), who first recognized *D. tropidococcyx* as a species of the genus *Dryophis*,

later, in 1860, established conspecificity between Duméril et al.'s *Psammophis perroteti* and Jerdon's *Leptophis canarensis*, and his own *Dryophis tropidococcyx*. Since Günther (1860) believed this taxon as neither belonging to the genera *Psammophis*, *Leptophis* or *Dryophis*, he described a new genus *Tropidococcyx* and transferred the taxon "*perroteti*" to it, thus naming the specimen *Tropidococcyx perroteti*. Günther (1864) gave a good taxonomic history of this species, with a list of synonyms, but unfortunately misspelled Jerdon's "*canarensis* as *canariensis*" and also incorrectly attributed this name to Jerdon, 1855, instead of 1854. Theobald (1876) also misspelled it as "*kanariensis*". Boulenger (1890) and Smith (1943) attributed *Leptophis canarensis* to Jerdon 1853 (instead of 1854), in which case, the species name of Jerdon (1853) would be applicable to this taxon, as it preceded Duméril et al.'s (1854) "*perroteti*", according to Article 23 of the Code. However, volume 22 of the Journal of the Asiatic Society of Bengal published sensu Article 8 of the Code as only in the year 1854, as is evident from the front section of the volume and the taxon-author name of *Trigonocephalus (Cophias) malabaricus* Jerdon, 1854 which appeared on page 524 of the very same issue.

Additionally, Smith (1943), in his list of synonyms, did not mention any names that Günther erected. Subsequent generic reallocations produced several combinations such as *Tragops perroteti*, *Dryophis perroteti* and lastly, the currently-accepted name *Ahaetulla perroteti* (see Theobald, 1876; Boulenger, 1890; Savage, 1952; Whitaker & Captain, 2004). After Günther (1864) few taxonomic actions apart from these generic reallocations, happened for the species. Günther (1864) quoted *Leptophis nilagiricus* in the species accounts of *Tropidococcyx perroteti*, but did not list *Leptophis nilagiricus* as a valid species of his genus *Tropidococcyx* (which he still maintained to be monotypic), nor did he place *Leptophis nilagiricus* in the synonymy of *Tropidococcyx perroteti*. Therefore, Günther (1864) and no other subsequent authors, fully recognised *Leptophis nilagiricus* either as synonym of *Ahaetulla perroteti* or as a distinct, valid species.

Leptophis? nilagiricus? Jerdon, "1853" 1854

is consistent with *A. perroteti* in all characters except for its 13 scalerows (15 in *A. perroteti*) and absence of lateral stripe on the belly (present in *A. perroteti*). Therefore, it would be careful to suggest that it is not yet clear whether *Leptophis nilagiricus* is conspecific with *Ahaetulla perroteti*. It is also noteworthy that *A. perroteti* has 13 posterior scalerows (Wall [1919]; herein, this study) and that, some of our live individuals discussed herein, had nominal lateral striping. Since, Günther, (1864) did not fully assess the status of *Leptophis nilagiricus* Jerdon 1854, we believe this name has remained obscure in the literature (see Günther, 1864; Boulenger, 1890; Smith, 1943). We therefore suggest that the name *Leptophis nilagiricus* should be brought back to notice from obscurity and clarified by further taxonomic investigation of *Ahaetulla perroteti* (the valid species with which Günther [1864] associated the name *Leptophis nilagiricus*).

There is uncertainty over the existence of any deposited specimen(s) of *L. nilagiricus* and to provide details about this issue we here quote Jerdon's own lines as they appear on the introductory part before his systematic accounts on squamate reptiles and amphibians; "*The following is merely a brief and imperfect resumé of the serpents and frogs of S. India, drawn up from my drawings, with a few rough notes attached to them; as circumstances have prevented my giving a more full account at this time; but a detailed account will be drawn up, as soon as again I have access to my collection.*" (verbatim from Jerdon 1854: p 522). Here Jerdon admits that he had based his accounts only on drawings and was yet to examine his collected specimens. This also could imply that preserved specimen(s) of *Leptophis nilagiricus* possibly existed. However, no information on the repository/museum where the specimen depicted by W. Elliott was preserved and deposited appeared in Smith (1943).

Because Elliott's figure forms the basis for the description of *L. canarensis*, the figure becomes the only unambiguous "referred material" [if not the iconotype] for this name. Moreover, to the best of our knowledge, no snake in Nilgiris or elsewhere in its vicinity, fits the exact description of *L. nilagiricus*. Only some species such as *Dryocalamus nympha*,

Xylophis perroteti and *Calliophis* spp. have 13 midbody scalerows. Furthermore, none of these valid species have a green dorsum as described by Jerdon (see Wall [1919] and Smith [1943]).

In conclusion the status of *Leptophis? nilagiricus?* Jerdon "1853" 1854, based on W. Elliott's figure, from Neelgherries, is *incertae sedis*. We believe that further taxonomic work involving the ancient types of the synonyms could solve this fascinating history and taxonomic conundrum.

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