

## **Two egg-eating snakes in India. *Elachistodon westermanni* Reinhardt, 1863 (Serpentes, Colubridae), divided into two allopatric subspecies.**

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### **ABSTRACT**

*Elachistodon westermanni* Reinhardt, 1863, better known as the Indian egg-eating snake is a little –known taxon from the Indian Subcontinent. Two allopatric populations are known, separated by a distance of about 450 km at the narrowest point and while morphologically similar, are sufficiently divergent to warrant taxonomic recognition as separate biological entities.

Therefore the purpose of this paper is to formally name the south-west population as a new subspecies, *Elachistodon westermanni sloppi* subsp. nov. according to the rules of the *International Code of Zoological Nomenclature* (Ride et al. 1999).

Keywords: snake; taxonomy, nomenclature, India, *Elachistodon*; *westermanni*; new subspecies; *dannybrowni*; conservation.

### **INTRODUCTION**

*Elachistodon westermanni* Reinhardt, 1863, better known as the Indian egg-eating snake is a rarely seen (by herpetologists anyway) and consequently a little known taxon from the Indian Subcontinent.

Until now it has been treated as a monotypic taxon.

Long thought to be closely related to snakes of the genus *Dasyplectis* Wagler, 1830 from Africa and the Middle-east, the most recent molecular study by Mohan et al. (2018) has shown the closest relatives to be within the *Boiga sensu lato* group as defined by Hoser (2012) and Hoser (2013).

Two well-defined allopatric populations are known, shown to be separated by a distance of about 450 km at the narrowest point (Khandal et al. 2016).

Until now, all previous authors have treated all relevant snakes from both populations as being of one and the same species. However inspection of specimens by myself via the literature, numerous published photos and the limited number I could easily locate in Zoological Collections (a grand total of 3 specimens), confirmed that each population are morphologically distinct and divergent and should therefore be treated as separate taxonomic entities.

Therefore the purpose of this paper is primarily to formally name the unnamed south-western population as a new subspecies *Elachistodon westermanni dannybrowni* subsp. nov. according to the rules of the *International Code of Zoological Nomenclature* (Ride et al. 1999).

The formal naming as a subspecies is conservative and there is a strong likelihood that in the future, this taxon may need to be elevated to the status of full species.

In any event it is clearly geographically separated from the form herein identified as *Elachistodon westermanni westermanni* and therefore by the species definitions used by many, would already qualify as a fully functioning and evolving species in effective isolation of all others of similar form.

As inferred already, the materials and methods of this paper and results are self-evident.

The relevant key literature supporting the taxonomic decisions and actions within this paper are as follows: Boulenger (1890, 1896), Captain et al. (2015), Dandge et al. (2016), Gans (1954), Hoser (2012, 2013), Khandal et al. (2016), Mohan et al. (2018), Narayanan (2012), Schleich and Kästle (2002), Sharma (2004), Sharma (2014), Smith (1943), Vyas (2006, 2010, 2013, 2016), Vyas et al. (2017) and Wall (1913) including sources cited therein.

In terms of the formal description below, the spelling of the scientific name assigned should not be altered in any way unless absolutely mandatory under the rules of zoological nomenclature as published by the ICZN in the *International Code of Zoological Nomenclature* (Ride et al. 1999).

### **ELACHISTODON WESTERMANNI DANNYBROWNI SUBSP. NOV.**

**Holotype:** A preserved specimen, specimen number: NZC-V/3412 held at the National Zoological Collection at the Zoological Survey of India, (Jodhpur), collected at Bherounda Khurd, Sawai Madhopur, Rajasthan, India.

This is a government-owned facility that allows access to its holdings.

**Diagnosis:** *Elachistodon westermanni dannybrowni* subsp. nov. is readily separated from nominate *Elachistodon westermanni westermanni* by the possession of a distinctive angular yellowish cross band on the nape. In *Elachistodon westermanni westermanni* there is no such obvious band and the nape is brownish in colour and no band is obvious. *Elachistodon westermanni dannybrowni* subsp. nov. is also readily separated from the nominate subspecies by dorsal colouration. In *Elachistodon westermanni dannybrowni* subsp. nov. the light yellowish vertebral stripe is thick and well-defined for the entire body length, whereas in *Elachistodon westermanni westermanni* it is characterized by being thinner and often broken at the posterior end of the body.

In both taxa the mid-dorsal stripe is broken at the anterior end of the body (neck region) before it establishes further down.

Scale counts and configurations between both taxa appear to overlap and cannot be reliably used to separate the taxa.

Both are characterised by the following suite of characters: Rostral

is twice as broad as deep, just reaching the upper surface of the head; internasals and prefrontals are subequal in size; frontal is rather longer than broad, as long as its distance from the end of the snout, shorter than the parietals; loreal small, longer than deep, entering the eye; a small preocular is above the loreal; two postoculars; two very long temporals; 6 or 7 upper labials, third and fourth entering the eye equally; 3 pairs of large chin-shields.

There are 15 mid-body rows. 197-220 ventrals (higher counts in females); anal entire; 58-65 subcaudals.

Colouration is best described as being brownish above, with scattered lighter flecks on the flanks, almost arranged in a patterned configuration and with a distinctive yellowish vertebral band (see separation between the two subspecies given above); a cream or yellowish band commences on the snout and runs along each side of the head to the temporals and the angle of the mouth; in *Elachistodon westermanni westermanni* there is an angular yellowish cross band on the nape, this not being seen in *Elachistodon westermanni dannybrowni subsp. nov.*; lower parts in both taxa are yellowish to whitish and shiny, tending more whitish in *Elachistodon westermanni dannybrowni subsp. nov.* and more yellowish in *Elachistodon westermanni westermanni*.

The holotype of *Elachistodon westermanni dannybrowni subsp. nov.* is described in detail and depicted in the paper of Khandal *et al.* (2016). Vyas *et al.* (2017) also depict a number of photos of *Elachistodon westermanni dannybrowni subsp. nov.*

Nominate *Elachistodon westermanni westermanni* is depicted in Gans (1954) at Fig. 4, showing the distinctive head markings of this taxon as opposed to what is seen in *Elachistodon westermanni dannybrowni subsp. nov.* as depicted in the publications of Khandal *et al.* (2016) and Vyas *et al.* (2017).

**Distribution:** *Elachistodon westermanni dannybrowni subsp. nov.* occurs in northern India, generally south of the Ganges floodplain and flats, not including the eastern part of India.

Specimens north of the Ganges Valley and including Eastern India are of the nominate subspecies.

Sharma (2014) provides a distribution map for both subspecies at page 162, Fig. 1. *Elachistodon westermanni westermanni* has its distribution marked by the circles numbered, 1-5 and 15.

*Elachistodon westermanni dannybrowni subsp. nov.* has its distribution marked by circles 6-14 and 16, representing the approximate northern extremity of the range of this taxon.

**Conservation:** That the species *Elachistodon westermanni* survives in India is in spite of human activities and not because of any proper conservation measures in place. In common with much of planet Earth, India has an exploding human population that in turn puts pressure on the survival of countless species.

The most effective conservation measure for this and most other non-domestic species native to India and most other parts of the world, is for governments to regulate human population and birth rates in India and for that matter, elsewhere (Hoser 1991). In terms of *Elachistodon westermanni* it is clear that both subspecies can survive in severely degraded habitats and agricultural areas (or at least on the periphery of agricultural precincts), meaning the short term survival of the species is likely to continue and it may in fact be more abundant than current publications on the genus suggest.

**Etymology:** Named in honour of Dr. Danny Brown of the Sunshine Coast in south-east Queensland, Australia, herpetologist and author of numerous books specializing in the keeping of Australian reptiles including for example Brown (2014), generally regarded as being "best in class", recognizing his immense ongoing contributions to herpetology in Australia and elsewhere.

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#### CONFLICTS OF INTEREST

There are no conflicts of interest in relation to this paper.