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## A new species of Indian caecilian highlights challenges for species delimitation within *Gegeneophis* Peters, 1879 (Amphibia: Gymnophiona: Indotyphlidae)

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### Abstract

A new species of indotyphlid caecilian amphibian, *Gegeneophis tejaswini* sp. nov., is described based on eight specimens from lowlands of the most northerly district of the state of Kerala in the southern part of the Western Ghats region, India. This species is distinguished from all other *Gegeneophis* in annulation characters and genetics (> 6% different from most similar nominal species for 883 base pairs of mitochondrial *12S* and *16S* rRNA gene sequence data). The high degree of morphological similarity of *G. krishni*, *G. mhadeiensis* and the new species underlines that, for some *Gegeneophis*, larger samples and/or new characters will be needed to further advance the taxonomy of this genus.

**Key words:** caecilians, herpetology, India, taxonomy, Western Ghats

### Introduction

In Taylor's (1968) comprehensive taxonomic treatment of the caecilians of the world, the genus *Gegeneophis* Peters, 1879 included three species, two from the southern Western Ghats region of peninsular India and a third from northeast India. At that time, *Gegeneophis* ranked 16th of the caecilian genera in terms of the number of included species. Research since 1999 has resulted in many new species descriptions of *Gegeneophis* (Agarwal *et al.* 2013; Bhatta *et al.* 2007a, b; Bhatta & Srinivasa 2004; Giri *et al.* 2003, 2004, 2011; Kotharambath *et al.* 2012a; Pillai & Ravichandran 1999; Ravichandran *et al.* 2003). This descriptive work, together with the removal of the northeast Indian forms (Kamei *et al.* 2012) and a new synonymy (Gower *et al.* 2013), has seen *Gegeneophis* become the fourth most speciose of the 32 currently recognised (Wilkinson *et al.* 2011, 2013a, 2014a; Kamei *et al.* 2012; Nishikawa *et al.* 2012) caecilian genera globally. As currently conceived (Wilkinson *et al.* 2011; Gower *et al.* 2013; Agarwal *et al.* 2013), the endemic Indian genus *Gegeneophis* comprises 11 species that are the only caecilians in peninsular India that have the eye covered by bone. Most of the new species of *Gegeneophis* described since 1999 have been discovered in the states of Karnataka, Goa and Maharashtra, with only one from the more southerly state of Kerala (Kotharambath *et al.* 2012a). Here we describe a new species of caecilian from the northern part of Kerala that we identify as an additional *Gegeneophis* primarily on the basis of it having the eye covered by bone. It is distinguished from congeners primarily by annulation characters and its distinctiveness is supported by analysis of mitochondrial DNA sequence data.

### Material and methods

The new species is described based on a series of eight specimens collected from a single locality in northern Kerala between 2008 and 2010. All specimens were fixed in 5–10% aqueous formaldehyde following anaesthesia (MS222), washed in water after 48 hours and stored in 70% ethanol. Following common usage we refer to an area

(*Gegeneophis carnosus*, *G. primus*, *G. krishni*, *G. tejaswini* sp. nov., and *Ichthyophis kodaguensis*) and records of at least four other species (*I. beddomei*, *I. bombayensis*, *I. longicephalus* and *Uraeotyphlus* sp.: e.g., Kotharambath *et al.*, 2012b).

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