A new species of centipede of the genus Cryptops Leach (Scolopendromorpha: Cryptopidae) from southern Western Ghats with a key to the species of Cryptops in India

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Abstract: A new species of blind cryptopid centipede of the genus Cryptops Leach belonging to the hortensis group viz. Cryptops (C.) malabarensis is described from the southern Western Ghats, Kerala, India and the family Cryptopidae (Scolopendromorpha) is reported for the first time from the area. Affinities of the new species with a Madagascar species are discussed and a key to separate the Indian species of Cryptops is also provided.

Keywords: Chilopoda, Cryptopidae, Cryptops malabarensis sp. nov, key, new species, Scolopendromorpha, southern Western Ghats.

The Western Ghats in India, with its very diverse assemblage of flora and fauna is one of the hotspots of biodiversity (Myers et al. 2000). With a few exceptions, the invertebrate fauna of the Western Ghats has been inadequately studied both in terms of their diversity and conservation priorities (Kunte in press). Though an integral part of the soil ecosystems, the fauna of scolopendromorph centipedes (Chilopoda: Scolopendromorpha) of the Western Ghats is still little known except for the pioneering works by Attems (1930), Jangi & Dass (1984), Yadav (1993) and Sureshan et al. (2006). A perusal of the literature reveals the occurrence of 40 species of scolopendrid centipedes belonging to eight genera and two families in the Western Ghats. Like the families Plutoniumidae and Scolopocryptopidae and the order Geophilomorpha, the family Cryptopidae are blind centipedes, lacking ocelli. Cryptops Leach, 1815, is the largest genus of the family Cryptopidae, with 153 named species worldwide (Lewis 2002), in four subgenera i.e., C. (Cryptops) Leach, 1815; C. (Chromatonops) Verhoeff, 1906; C. (Haplocryptops) Verhoeff, 1934 and C. (Trigonocryptops) Verhoeff, 1906 (Bonato et al. 2011). The smaller size and fragile body, coupled with an abundance of species names, often founded on inadequate samples and with imprecise descriptions, make cryptopid centipedes a taxonomically difficult group and only seven species in two genera have so far been described from India. The Indian species of Cryptops are Cryptops (C.) feae Pocock, 1891, Cryptops (C.) doriae Pocock, 1891, Cryptops (C.) kempi Silvestri, 1924, Cryptops (C.) setosior Chamberlin, 1959 and Cryptops (Trigonocryptops) orientalis Jangi, 1955 (Khanna 2005, 2008).
Materials and Methods

During the faunal exploration surveys, interesting specimens of cryptopids were collected from the forested tracts of southern Western Ghats and its foot-hills (Fig. 1). The collections represent the first record of the family Cryptopidae from the area and permit the description of a new species of Cryptops. The new species shows very close affinity with C. decoratus Lawrence, 1960, which has its distribution in Madagascar (holotype), Mauritius (Lewis 2002), and the Seychelles (Lewis 2007). The specimens are deposited in the Zoological Survey of India, Western Ghats Regional Centre, Calicut (ZSIC), Kerala, India.

Digital imaging was carried out using a Leica M205A stereomicroscope and a Leica DFC-500 digital camera. Scanning electron micrographs were captured with a Jeol JCM-5000 Neoscope bench-top SEM. The terminology used by Bonato et al. (2010) is followed in this paper.

Cryptops (Cryptops) malabarensis sp. nov. 
(Figs. 2-3 and Images 1–5)

Material examined


Diagnosis: A species of Cryptops lacking anterior transverse suture on Tergite-1; tergite paramedian sutures from tergite 4 or 5–20; absence of saw teeth on the ultimate femur (C. hortensis group); ultimate leg tibia with 4–7 saw teeth on the tibia and 3–4 on tarsus one; no accessory spurs associated with the tarsal claw.

Description of holotype

Body length 23mm. Colour (before and after preservation) greyish-brown with dark subcutaneous pigment on tergites. Ultimate legs yellow.

Antennae composed of 17 articles; basal two articles relatively stout with long setae distally. An irregular whorl of long setae distally. An irregular whorl of long setae on the proximal end of articles 1–3, the rest with setae scattered irregularly, not in whorls but the dorsal middle region is not densely covered. Short, fine setae abundant from 6th

Figures 2–3. Cryptops (Cryptops) malabarensis sp. nov. (ZSI/WGRC/I-R/INV 2108) 
2 - Cephalic plate and Tergite-1; 3 - Sternite suture

UK - Urakkuzhy, Malabar Wildlife Sanctuary; NK - Narayankualam.
article onwards (Images 4 & 5).

Cephalic plate and tergite one without sutures, tergite one overlying the posterior edge of the cephalic plate (Fig. 2). Anterior edge of forcipular coxosternite weakly bilobed (Image 1) and with four long and one small setae on each side. Tergite paramedian sutures from tergite 4 or 5–20. Tergite 21 without sutures and with slightly angular posterior margin. Sternites with longitudinal and transverse sulci, longitudinal sulci longer than the transverse (Fig. 3). Sternite 21 with sides converging very slightly and straight posterior margin (Images 2 & 8). Legs 1–19 with undivided tarsi. No accessory spurs associated with the tarsal claw (Image 9).

Coxopleuron with nine large pores and with at least three minute setae in porefield; three or four fine setae on posterior margin and up to five between this and porefield. Posterior area of coxopleuron is poreless.

Leg 20 with dense fine setae ventrally on prefemur, femur and tibia in all specimens. Ultimate legs with strong setae on anterior, ventral and posterior surfaces of prefemur and on ventral and posterior surfaces of femur. Median longitudinal glabrous area absent. No distal tubercle on tibia and tarsus. No saw tooth on the femur (Image 4); seven on the tibia and three on the tarsus 1 (Image 3).

**Additional information from paratypes**

Body length of paratypes varies between 11–21 mm. Antennae of leftside is damaged in 2079. When compared to the holotype, the number of saw teeth on the ultimate leg tibia varies from four (2079), five (2080) or six (2108, 2109) and on tarsus 1 the variation is either three (2080, 2108, 2109) or four (2079) saw teeth. The number of coxopleural pores are not clearly countable.

**Etymology**

The species is named after the type locality “Malabar Wildlife Sanctuary”, Kerala, India.
Table 1. Ecological observations from the sampling sites

<table>
<thead>
<tr>
<th>Physiographic category</th>
<th>Midland</th>
<th>Highland</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sampling sites</td>
<td>Narayamkulam</td>
<td>Kakkayam</td>
</tr>
<tr>
<td>Altitude</td>
<td>145m</td>
<td>641m</td>
</tr>
<tr>
<td>Atm. temp</td>
<td>24–30 °C</td>
<td>19–28 °C</td>
</tr>
<tr>
<td>Distance from water source</td>
<td>120m</td>
<td>75m</td>
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<td>Type of vegetation</td>
<td>agro ecosystem near a semi deciduous forest patch</td>
<td>moist deciduous forest</td>
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<tr>
<td>Soil temperature</td>
<td>23–27°C</td>
<td>15–25°C</td>
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<tr>
<td>soil pH</td>
<td>4.91</td>
<td>4.76</td>
</tr>
<tr>
<td>Org. Carbon</td>
<td>3.12</td>
<td>9.15</td>
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</tbody>
</table>

Ecological observations

Habitat: The specimens were collected from moist deciduous forest tracts of southern Western Ghats. All specimens were found in loose soil, about 4–5 cm below the surface. Ecological parameters of the two collection localities during the period of March–April 2011 are provided in Table 1.

Discussion

Cryptops malabarensis sp. nov. is conspicuously different from the other described Indian species of Cryptops included in the C. doriae group (having saw teeth on the ultimate leg femur); and falls in the Old World C. hortensis group of Lewis (2011) (those lacking saw teeth on the ultimate leg femur), which have not yet been reported from India. C. malabarensis sp. nov. closely resembles C. decoratus Lawrence (1960), which is also
a member of the Old World C. hortensis group. The two species share the absence of sutures on the cephalic plate and tergite one; anterior margin of coxosternite almost straight, an overlapping number of coxopleural pores (7–9), a similar number of setae in the porefield (at least three) and ultimate leg characters such as prefemur with long fine setae dorsally, absence of a median longitudinal glabrous area, tibia with four and tarsus 1 with two saw teeth. However the new species differs from the holotype description of C. decoratus, in having no median ridges on the tergites, no posterior median depression on tergite 21 and the absence of accessory spurs on the pretarsi. C. decoratus is a Malagasy species closely related to C. melanotypus Chamberlin, 1941 from the Philippines, Mauritius and the Seychelles but Lewis (2011) was unsure of their exact status. However, the strong similarity between the new species and C. decoratus and C. melanotypus suggests dispersal of a group of closely allied species over a wide area.

REFERENCES


Leach, W.E. (1815). A tabular view of the external characters of four classes of animals which Linné arranged under Insecta, with the distribution of the genera composing three of these classes into orders etc., and descriptions of several new genera and species. Transactions of the Linnaean Society of London (Series 1) 11: 306–400.


