

## Neotype designation and redescription of *Camponotus horseshoetus* (Hymenoptera: Formicidae)

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**Abstract.** A neotype is designated for *Camponotus horseshoetus* Datta & Raychaudhuri, 1985 as the type material is lost. The original description is ambiguous and for that reason we redescribe the species with illustrations. *Camponotus horseshoetus* is recorded from West Bengal and Himachal Pradesh for the first time.

**Key words.** Hymenoptera, Formicidae, Formicinae, neotype, redescription, morphology, Himalaya, India

### Introduction

*Camponotus* Mayr, 1861 is the most speciose genus within the subfamily Formicinae and its recent fauna is currently represented by 1,095 species and 493 subspecies, supplemented by 32 fossil species; the genus is distributed worldwide (BOLTON et al. 2007, BOLTON 2014). In India, this genus is represented by 63 species and subspecies (BHARTI 2011, BHARTI & WACHKOO 2014a). Despite their large size and abundance, most *Camponotus* ants are difficult to identify because of their morphological monotony coupled with the lack of revision of this group (BHARTI & WACHKOO 2014a).

*Camponotus horseshoetus* Datta & Raychaudhuri, 1985 was originally described based on two workers, holotype and paratype from Kohima, Nagaland, India, 28.xi.1982, collected by D. R. Pramanik, and deposited in the Entomology Laboratory, Department of Zoology, Calcutta University (DATTA & RAYCHAUDHURI 1985). Unfortunately, senior author's search of the mentioned collection failed to uncover any trace of the type specimen of this species. As the type material of this species cannot be located and is assumed to have been damaged or lost and no original material of this species exists, we therefore, in the interest of stabilizing

the nomenclature, designate a neotype for *Camponotus horseshoetus*, using a specimen collected in Indian Himalaya, which is well within the area of its natural distribution. We take this action under the article 75.1 of the Code (ICZN 1999).

With this action, there can be no doubt as to the identity of this species. We designate neotype with the express purpose of clarifying the taxonomic status of *Camponotus horseshoetus* as the original description is ambiguous and does not mention the presence of metapleural gland found in this species. This gland, one of the autapomorphies uniting the family Formicidae, has been lost in a handful of genera (BOLTON 2003) including all but two known species of *Camponotus* (SHATTUCK 2005).

However, most of the original description, images and the collection area are all in conformity with our specimens and thereby enabling us to confidently designate a neotype of this species. The present designation of a neotype for *Camponotus horseshoetus* is in accordance with the Article 75.3 of the International Code of Zoological Nomenclature (ICZN 1999). We herein designate a neotype and redescribe the species with illustrations with the hope of correcting some of the taxonomic neglect that has plagued the Indian Formicinae (see BHARTI & WACHKOO 2012, 2014b). This species is the only member of the genus possessing metapleural gland which is known to occur in India.

## Material and methods

The specimens were collected through hand searching. The taxonomic study was conducted on a Nikon SMZ 1500 stereo zoom microscope. For digital images, an Evolution MP digital camera was used on the same microscope with Auto-Montage (Syncroscopy, a division of Synoptics Ltd.) software. Subsequently, the images were cleaned with Adobe Photoshop CS5. The neotype and other non-type specimens are housed in the Punjabi University Ant Collection (PUAC). Morphological terminology for measurements (given in millimeters) and indices found below follow WACHKOO & BHARTI (2014a,b).

HL	maximum length of head in full-face view, measured in straight line from the anteriormost point of the median clypeal margin to the midpoint of the posterior margin of head.
HW	maximum width of head in full-face view.
EL	maximum length of eye as measured normally in oblique view of the head to show full surface of eye.
SL	maximum length of the scape excluding the basal neck and condyle.
PW	maximum width of pronotum in dorsal view.
ML	mesosomal length in profile, from the anteriormost border of the pronotum, excluding the pronotal cervix to the posterior basal angle of the metapleuron.
MTL	maximum length of the mesotibia from its margin with the femur to its margin with the tarsus.
HTL	maximum length of the metatibia from its margin with the femur to its margin with the tarsus.
PL	maximum length of the petiole in profile, measured in a straight horizontal line from immediately above the dorsal base of the anterior petiolar tubercle to the posterior margin.
GL	the length of the gaster in profile from the anteriormost point of the first gastral segment to the posteriormost point.
TL	total outstretched length of a specimen, excluding mandibles.
CI	cephalic index: $HW/HL \times 100$
SI	scape index: $SL/HW \times 100$ .

## Results

### *Camponotus horseshoetus* Datta & Raychaudhuri, 1985

(Figs 1–4)

*Camponotus horseshoetus* Datta & Raychaudhuri, 1985: 271, fig 1, pl. 1 (original description).

*Camponotus horseshoetus*: BOLTON (1995): 103 (subgenus indeterminate).

**Type material.** NEOTYPE: worker, **INDIA: WEST BENGAL:** Darjeeling, 27.0383°N 88.2620°E, 1850 m a.s.l., 20.vi.2009, hand collected (PUAC: coll. Aijaz A. Wachkoo).

**Additional material examined.** 3 workers with the same data as neotype; 9 workers, **INDIA: HIMACHAL PRADESH:** Baijnath, 32.0527°N 76.6500°E, 1125 m a.s.l., 17.vi.2010, hand collected (PUAC: coll. Aijaz A. Wachkoo).

**Redescription.** Worker measurements (n=9): HL 1.14–1.30; HW 0.98–1.15; EL 0.31–0.34; SL 0.97–1.03; PW 0.67–0.78; ML 1.44–1.73; MTL 0.94–1.03; HTL 1.14–1.18; PL 0.20–0.22; GL 1.89–1.95; TL 4.68–5.16 mm. Indices: CI 86.54–88.89, SI 89.58–98.78.

Head ovoid, slightly longer than wide, narrowed anteriorly, lateral margins gently convex, posterior margin convex; clypeus in full-face view wider than long, wider anteriorly; anterolateral corners broadly rounded, mandibles slender, armed with 5-teeth, their tips overlap and the entire blades are tucked away under the clypeus in such a way that only their external margins show along the anterior clypeal margin; scape surpassing posterior cephalic margin by about one-third its length.

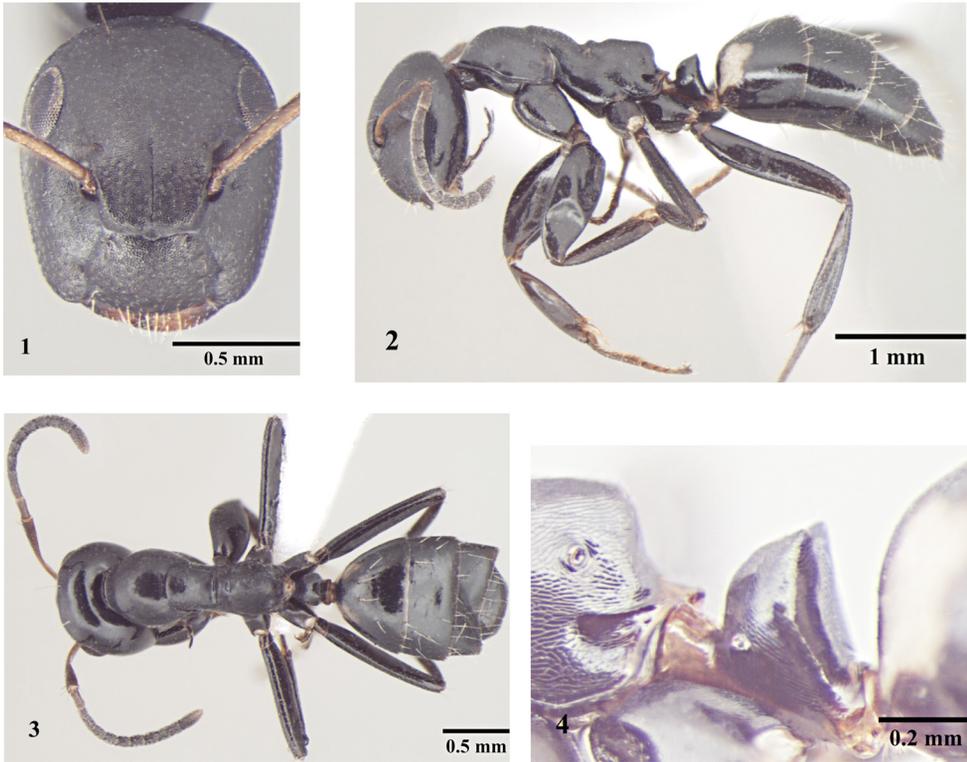
Mesosomal outline in profile interrupted by deep metanotal groove; promesonotum forms a regular convexity with shallow impression at promesonotal suture, metanotum lower than promesonotum and propodeal dorsum; propodeum raised, dorsal margin forms right angle with declivity; metapleural gland orifice distinct; propodeal spiracle round; in profile petiole, subrectangular, with dorsal margin sloping anteriorly; anterior margin nearly straight; posterior margin broadly concave; dorsally seen petiolar summit strongly concave; sides angulate; hind tibiae round in cross section.

Head microreticulate; remainder of the body lightly microreticulate, appearing finely striate; mesosomal, petiolar and gastral striation transverse; mesopleuron longitudinally striate; scapes microreticulate; body shiny.

Body covered with very short and very sparse appressed pubescence; head and all gastral segments with erect long setae, denser on gaster; setae absent on mesosoma and petiole; metanotal orifice without guard setae.

Body black; antennae and legs with reddish tinge, first gastral tergite with two yellow-brown spots anterolaterally.

**Comparative diagnosis.** This species is unusual in that it is only the second Southeast Asian species of *Camponotus* known to have a metapleural gland, the other being *Camponotus gigas* (Latreille, 1802) distributed in Thailand, Malaysia, Singapore, Borneo, and Sumatra (SHATTUCK 2005, BOLTON et al. 2007). It can be easily distinguished from the latter by presence of deeply impressed metanotal groove; very sparse pubescence; metanotal orifice without tuft of guard setae and dorsally strongly concave petiole, whilst in *Camponotus gigas* mesosomal outline is smoothly arched in lateral view without any metanotal groove; body is covered with dense pubescence; metanotal orifice is covered with guard setae and petiole scale is dorsally convex.



Figs 1–4. *Camponotus horseshoetus* Datta & Raychaudhuri, 1985, worker. 1 – head, full face view. 2 – body, lateral view. 3 – body, dorsal view. 4 – metapleural gland orifice on posterior propodeum.

**Distribution and habitat.** This species seems to be widespread in Indian Himalaya although infrequent in collections. Previously it was known only from the Nagaland state of Northeast Himalaya (DATTA & RAYCHAUDHURI 1985). Here we report its distribution both in the Northeast Himalaya (Darjeeling, West Bengal) and Northwest Himalaya (Bajjnath, Himachal Pradesh). It was collected from tree branches. Our observations indicate that it is an arboreal forager, which confirms earlier observations of DATTA & RAYCHAUDHURI (1985) finding workers tending groups of *Aphis gossypii* Glover, 1877 on *Hibiscus rosasinensis* Linnaeus, 1753.

### Discussion

Most of the original description, images and the collection area are all in conformity with our specimens and thereby enabling us to confidently designate the neotype of this species and redescribe it accordingly. However, original description and line drawing of petiole (see DATTA & RAYCHAUDHURI 1985: 272: Fig. 1d) exaggerate the concavity of petiolar summit as

anteriorly directed convergent spines, but the original photograph (see DATTA & RAYCHAUDHURI 1985: 273: Fig. 1e) presents the real depiction of petiole. Mandibles are described as stout in original description; however, we find them slender.

The opening to the metapleural gland in *Camponotus horseshoetus* is positioned somewhat dorsally to where this structure is found in most formicine ants. This is especially noteworthy as *C. horseshoetus* is morphologically distinct from *C. gigas*, sharing few characters with it and with little indication that they are closely related. It is therefore highly likely that this gland has evolved independently in these two taxa. Clearly a detailed phylogenetic analysis will be required to address this hypothesis critically, undertaking of which is well outside the current study. *Camponotus horseshoetus* is a morphologically isolated species of the genus, which prevents us to place it in any of the described subgenera of *Camponotus* for the time being.

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