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Discovery of two new species of *Paraparatrechina* Donisthorpe, 1947 (Hymenoptera: Formicidae) from India

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ABSTRACT

Two new species, *Paraparatrechina sohryngkham* Saroj & Mandi sp. nov. and *Paraparatrechina ali* Saroj & Mandi sp. nov. are described here from India and a new morphological trait is revealed from the genus *Paraparatrechina*. The pinnate setae observed in these species is previously undocumented, thereby introducing a novel feature to the morphology of genus *Paraparatrechina*.

Keywords: Meghalaya, Assam, Morphological trait, Pinnate setae, Key, Taxonomy.

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INTRODUCTION

The genus *Paraparatrechina* is known from India with two species: *Paraparatrechina aseta* (Forel, 1902) and *Paraparatrechina neela* Sahanashree, Punnath, & Rajan Priyadarsanan (2024). *Paraparatrechina aseta*, the first known species from India was originally described in the genus *Prenolepis* Mayr, 1861. *Paraparatrechina* was erected by Donisthorpe in 1947 as a subgenus of *Paratrechina* Motschoulsky, 1863. Based on phylogenetic analysis of *Prenolepis* genus group, La Polla, Brady & Shattuck, 2010 elevated *Paraparatrechina* as a genus with distinct hair pattern, on dorsum of pronotum with 2 pairs, mesonotum and propodeum with a single pair each. In 2014 La Polla, et al., revised the genus in the Afro-tropical and Malagasy regions providing a key to species, where colour and hair pattern are considered defining characters for species.

Here two new species are erected from the Eastern parts of Himalayas, making the number of species from India to 4 and the global number to 45. Both species were collected from soil litter in tea gardens. *P. sohryngkham* was collected from tea garden of Meghalaya and *P. ali* from tea garden of Jorhat, Assam. Detailed observation of the specimens from both the species have shown a typical hair pattern and also modified hexagonal pattern on pygidium. Some of the hypogeic genera of ants like *Strumigenys*, *Calyptomyrmex* exhibit modified hair patterns. Buren (1941) reported plumose hair in Ants for the first time in *Lasius plumopilosus* Buren. In that species varied plumose pattern was found in different body parts and different castes; of which some of the hairs in female mesosoma was found in similar pinnate pattern, but the pinnules were restricted to the tip or at most to the distal half deserving it to be considered as plumose. Here the straight setae on body, which may be a generic character are found with a pinnate pattern on both the species: *P. ali* and *P. sohryngkham.* The SEM studies brought to light a remarkably interesting cluster of elongate, flat hexagonal pattern with round pores around the pygidium in *P. ali* (Fig. 6c). In *P. sohryngkham*, the hexagonal pattern is closely packed, deep and the pores are not prominent (Fig. 4g). These unique adaptations imply a fascinating and possibly vital role played by these ants beneath the soil.

MATERIALS AND METHODS

Specimens were collected by handpicking method from the tea gardens of Meghalaya and Assam (Figs. 1-2) and the collected specimens were preserved in 70% alcohol. The specimens were mounted on triangular cards and 5 specimens of *P. sohryngkham* kept in wet preservation (70% alcohol). Taxonomic studies were done using Leica S8APO Stereo zoom microscope. Photographs of specimens were made using LEICA MC 120 HD digital camera and LAS EZ software. All the photographs were stacked by Combine ZP software. Scanning Electron Microscope images were made through EVO 18 microscope (Carl Zeiss, Jena, Germany). All specimens are deposited in the National Zoological Collections of Zoological Survey of India, (HQ), Kolkata, West Bengal, India.

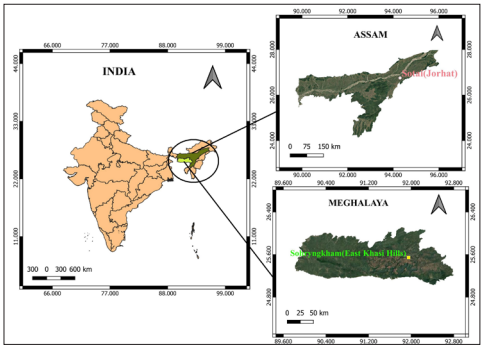

Figure 1. Collection Site of *Paraparatrechina sohryngkham* sp.nov from Meghalaya and *Paraparatrechina ali* sp.nov from Assam.

Figure 2. Habitat of *P. sohrynkham*.

Measurements and terminology

Abbreviations and definitions of measurements and indices follow LaPolla, et al., 2014

EL: Eye Length (maximum length of compound eye in full-face view)

GL: Gaster Length in lateral view

HL: Head Length (maximum length of head in full face view with clypeus)

HW: Head Width (maximum width of the head in full-face view)

PW: Pronotal Width (maximum width of the pronotum in dorsal view)

SL: Scape Length (maximum length of the antennal scape)

WL: Weber's Length (the maximum distance from anterior most part of pronotum to posterior most part of metapleuron excluding the neck in lateral view)

TL: Total Length (HL+WL+GL)

CI : Cephalic Index (HW/HL) × 100

REL: Relative Eye Length Index (EL/HL) × 100

SI: Scape Index (SL/HW) × 100

RESULTS

Key to species of *Paraparatrechina* of India, based on workers (modified from Sahanashree, et al., 2024)

1. Body yellow to light brown in colour ……..……..……..2

- Body metallic blue in colour ……..…… *P. neela*

2. Mandibles with 6 teeth ……..…….. *P. aseta*

- Mandibles with 5 teeth ……..……..…… .3

3. Body Light brown, opaque; anterior margin of clypeus transverse with a shallow emargination in the middle ……..…… *P. sohryngkham* Saroj & Mandi sp.nov.

- Body bright yellow, shining; anterior margin of clypeus round..... ..... *P. ali* Saroj & Mandi sp.nov.

Taxonomy

Order: HYMENOPTERA Linnaeus, 1758

Family: FORMICIDAE Latreille, 1809

Subfamily: FORMICINAE Latreille, 1809

Genus: *Paraparatrechina* Donisthorpe, 1947

Paraparatrechina sohryngkham Saroj & Mandi sp. nov. (Figs. 3-4)

Holotype: ☿, INDIA, Meghalaya, East Khasi Hills, Sohryngkham, 25.544486N, 91.95313E, 12.iii.2023, coll. Sheela, S (NZC, ZSI, Kolkata; Reg. no. 35383/H3); **Paratypes:** 7☿ with same locality data as Holotype (NZC, ZSI, Kolkata; Reg. no. 35384/H3-35386/H3)

Measurements: Worker Holotype, EL 0.11, GL 0.81, HL 0.46, HW 0.38, PW 0.20, SL 0.40, WL 0.47, TL 1.75, CI 82, SI 105, REL 23.

Worker Paratype, EL 0.10-0.12, GL 0.80-0.82, HL 0.45-0.47, HW 0.37-0.40, PW 0.18-0.21, SL 0.38-0.42, WL 0.45-0.48, TL 1.70-1.77, CI 82-85, SI 102-105, REL 22-25. (7 measured)

Color: Light brown, metasoma lighter and head darker; antennae and legs pale yellow with brownish tint at base, mandibles pale yellow with brownish teeth; petiole node lighter than rest of the body, pedicel and club of antennae lighter.

Sculpture: Head, thorax, antennae, legs and metasoma opaque, sides of thorax, apical face of propodeum and node of petiole shining; surface sculpture lightly imbricate, punctate, prominent on metasoma; clypeus polished, mandibles smooth, not polished.

Pilosity: Dorsum of head and body with long standing pinnate setae, pinnules on setae starts from above base; 3 pairs on surface of clypeus; median pair placed laterad, two pairs of standing setae on frontal lobes, 3 pairs on cephalic dorsum behind frontal setae and posterior margin with two pairs of setae, pronotum with 2 pairs, mesonotum and propodeum with one pair of setae each; pubescence on sides of thorax restricted to postero-ventral margins of sclerites.

Head: Clypeus very convex, dome like, anterior two third curved steeply down, no prominent carinae on clypeus, anterior margin shallowly intended in the middle with a long median seta and two short submedian setae, median lobe broad and anteriorly produced; in between antennal carinae a light median carina, ends at level of anterior margin of eyes; frontal lobes short, prominent; scapes passing beyond posterior margin of head by length of F1+F2; all funicular segments broader than long except F10; antennal toruli almost touching posterior clypeal margin, which is rounded without emarginations; eyes large, oval, hairy, not touching lateral margins, placed below median line; eye length subequal to the distance between anterior eye margin and posterior clypeal margin; mandibles with 5 teeth each, apical tooth longest, third tooth smallest, fourth tooth placed equidistant from first and basal tooth; base of mandible with a row of micro sensillae (Fig. 4b); 3 ocelli distinct.

Mesosoma: Compact, pronotum steeply rising towards mesonotum; meso and meta notum laterally compressed, pro-meso and meso-metanotal grooves distinct (Figs. 3a, 4d), latter more prominently defined, pronotum and mesonotum compact, pronotum raised, broad, anterior margin steep, mesonotum slightly sloping, propodeum short, apex 4.5x dorsum; metapleural gland orifice and guard hairs well developed (Fig. 4f); apex of propodeum steeply sloping (Fig. 4d).

Petiole: Node thin, polished, dorsally broad, anterior face flat, posterior face slightly convex

Metasoma: A little less than combined length of mesosoma and thorax, posterior margin of tergites with a row of pinnate setae, in addition to a few scattered ones on dorsum, pygidium with the closely packed, deep hexagonal pattern (Fig. 4g).

Differential Diagnosis

The species *P. sohryngkham* comes close to the other Indian species *P. aseta* in colour, sculpture and anterior clypeal margin being medially concave, presence of short fine pubescence. But it differs from *aseta* in having 5 teeth on mandible (6 teeth in *aseta*), clypeus not carinate in the middle (carinate in *aseta*); metanotal groove well developed (weakly developed in *aseta*); scape exceed the vertex by length of 2-3 funicular segments (scape surpass posterior margin by one fourth its length in *aseta*).

Etymology: The species is named after the type locality Sohryngkham, Meghalaya.

Figure 3. *Paraparatrechina sohryngkham* sp. nov.; a) Profile view, b) Head, c) Dorsal view.

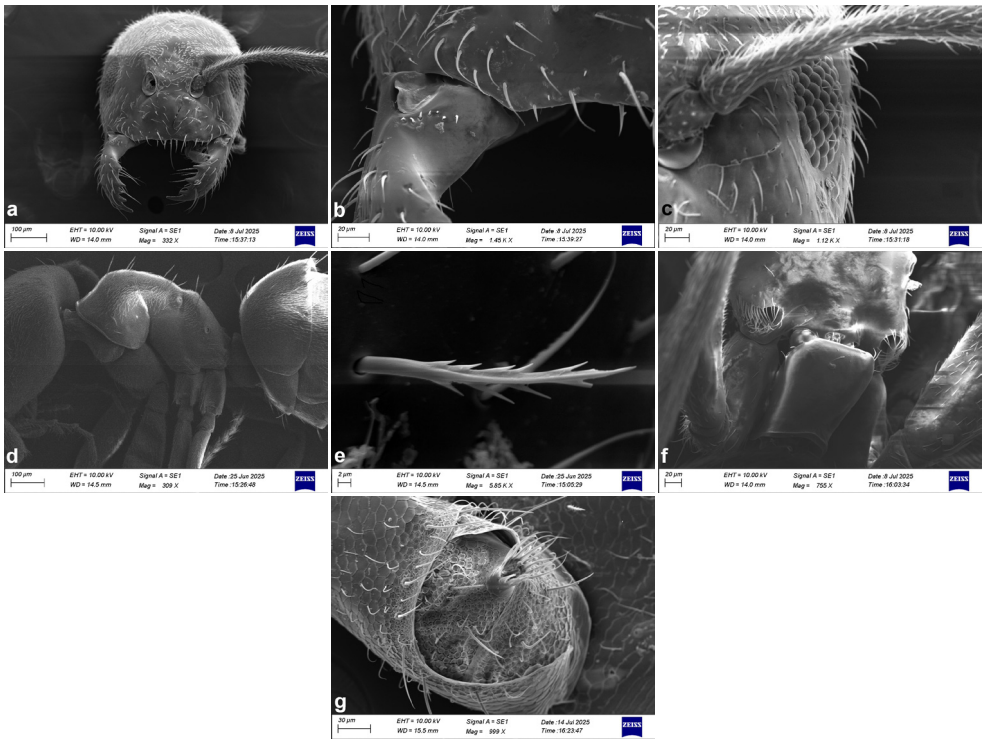

Figure 4. *Paraparatrechina sohryngkham* sp.nov.; a) Clypeus and mandible, b) Sensille on mandible, c) Hairs on eye, d) Mesosoma, e) Pinnate setae, f) Guard hairs on metapleural gland orifice, g) Pygidium.

Paraparatrechina ali Saroj & Mandi sp. nov. (Fig. 5-6)

Holotype: ☿, INDIA, Assam, Jorhat, Sotai Tea Estate, 26.74834N, 94.29855 E, 09.iii.2019, coll. A. Mandi (NZC, ZSI, Kolkata; Reg. no. 35387/H3); **Paratypes:** 3 ☿ with same locality data as Holotype (NZC, ZSI, Kolkata; Reg. no. 35388/H3- 35390/H3)

Measurements: Worker Holotype, EL 0.11, GL 0.68, HL 0.45, HW 0.37, PW 0.26, SL 0.42, WL 0.46, TL 1.59, CI 82, SI 113, REL 25

Worker Paratype, EL 0.10-0.12, GL 0.66-0.69, HL 0.44-0.46, HW 0.37-0.38, PW 0.25-0.27, SL 0.40-0.43, WL 0.46-0.48, TL 1.56-1.63, CI 82-84, SI 108-113, REL 22-26. (3 measured)

Color: Bright yellow with a light brown shade allover, lighter band of yellow at head anteriorly, antennae and legs light brownish yellow; anterior face of metasoma pale yellow.

Sculpture: Smooth polished with a weak substrigulate to imbricate sculpture visible mostly on metasoma; posterior margins of T4 and T5 finely punctate.

Pilosity: Clypeus with 3, frontal lobe 2, cephalic dorsum 3 and posterior margin of head with 2 pairs of pinnate setae, pinnules on setae starts from the base; pubescence dense on head, mesosoma and metasoma, less compact on mesosoma and arranged in a regular pattern on metasoma; scape of antenna, antero lateral and postero lateral parts of head with scattered decumbent short hairs.

Head: Clypeus convex with anterior margin rounded; masticatory margin of mandibles with 5 teeth, basal tooth smallest (Fig. 6b), fourth tooth broader and sharper than second tooth; basal margin of mandible slightly longer than masticatory margin; fourth tooth equidistant from basal and second tooth; eyes hairy, distance between anterior eye margin and posterior clypeal margin 0.8x eye length; scape passing beyond posterior margin by length of 3 funicular segments (Fig. 6a); ocelli distinct; posterior margin of head weakly convex.

Mesosoma: Pro-mesonotal suture distinct, meso-metanotal suture weakly indicated; pro, meso and metanotum in the same plane; apical face of propodeum 3x dorsal face (Fig. 5d); dorsal face not making a sharp angle with apical face. Mesonotum laterally compressed, apical face of propodeum steeply sloping (Fig. 5d)

Petiole: Very thin, linear, dorsal margin weakly emarginated.

Metasoma: Anterior face concave**;** pygidium surrounded by flat, linear, loosely packed hexagonal sculpture filled with micropores (Fig. 6c).

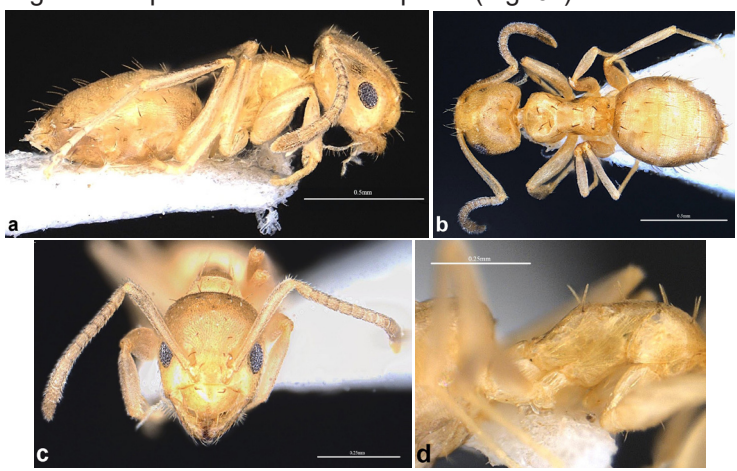

Figure 5. *Paraparatrechina ali* sp.nov.; a) Profile view, b) Dorsal view, c) Head, d) Mesosoma.

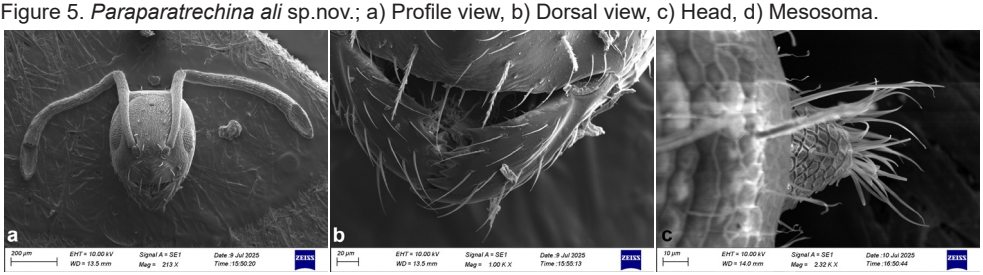

Figure 6. *Paraparatrechina ali* sp.nov.; a) Head, b) Mandible, c) Pygidium.

Differential diagnosis

The species *P. ali* resembles *P.glabra* (Forel, 1891), *P. oreias* LaPolla & Cheng, 2010 and *P. illusio* LaPolla & Fisher, 2014 in color. It shares some morphological attributes with *P. oreias* in having mesosoma compact in lateral view, with pronotum steeply

rising towards mesonotum; but differs from *P. oreias* in having scape and head with decumbent short setae in addition to appressed pubescence (in *oreias* only appressed hairs present on scape, no decumbent setae), metanotal suture not distinct in *ali* (in *oreias* metanotal area distinct). *P.ali* resembles more to *illusio* in having decumbent hairs on head and scape but it differs in, decumbent hairs restricted to anterolateral parts of head in *illusio*, whereas in *ali* it is present both in antero and postero lateral parts. Again *ali* resembles *illusio* in neat rows of tightly appressed pubescence on gaster but differs in not as shining as *illusio* and resembles *P. subtilis* for presence of decumbent hairs on head but differs in color and absence of long and dense gastral pubescence which is present in *subtilis*. *P. ali* differs in having mesosoma compact but in *P. glabra* having elongate mesosoma in lateral view.

Etymology: The species is named after late Dr. Musthak Ali who was one of the early taxonomists of Indian Ants.

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REFERENCES

Bharti, H. & Wachkoo, A.A. (2014). New combination for a little known Indian ant, *Paraparatrechina aseta* (Forel, 1902) comb. n. (Hymenoptera: Formicidae). *Journal of the Entomological Research Society,* 16(3), 95-99.

Buren, W. F. (1941). *Lasius (Acanthomyops) plumopilosus*, a new ant with plumose hairs from Iowa. *Iowa State College journal of science,* 15(3), 231-235.

Donisthorpe, H. (1947). Some new Ants from New Guinea. *Annals and Magazine of Natural History.* 11(14), 183-197.

La Polla, J. S., Brady, S. G., & Shattuck, S. O. (2010). Phylogeny and taxonomy of the *Prenolepis* genus-group of ants (Hymenoptera: Formicidae). *Systematic Entomology*, 35(1), 118-131.

Sahanashree, R., Punnath, A., & Rajan Priyadarsanan, D. (2024). A remarkable new species of *Paraparatrechina* Donisthorpe 1947 (Hymenoptera, Formicidae, Formicinae) from the Eastern Himalayas, India. *ZooKeys,* 1203, 159-172.