



Description of two new species of ants of the genus *Myrmecina* Curtis, 1829 (Hymenoptera: Formicidae: Myrmicinae) from the Eastern Himalayas

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Abstract

Two new species of the ant genus *Myrmecina* Curtis, 1829, *M. bawai* **sp. nov.** and *M. reticulata* **sp. nov.**, are described and illustrated based on the worker caste from Mizoram, Northeast India. The genus is reported for the first time from Mizoram, the Indian state with the highest percentage of forest cover. A key to the Indian fauna of *Myrmecina* is also provided based on the worker caste.

Key words: Dampa, Phawngpui, pitfall trap, taxonomy, Winkler trap

Introduction

The ant genus *Myrmecina* Curtis, 1829 belongs to the tribe Crematogastrini Forel, 1893 of the subfamily Myrmicinae Lepeletier de Saint-Fargeau, 1835 and is distributed in all geographic regions other than the Ethiopian (Ward *et al.* 2015; AntWeb 2020; AntWiki 2020). *Myrmecina* can be easily distinguished from other genera of the subfamily by the presence of a distinct elongated ridge or groove on the side of the head region behind the eye, and a rounded, barrel-shaped petiole which lacks an anterior peduncle (Shattuck 2009; Satria & Yamane 2019). These ants are rarely encountered in visual surveys and collected usually in leaf litter samples gathered from the forest floor (Lyu & Cho 2003; Shattuck 2009). They live in small colonies of 30 to 150 individuals under stones or decaying wood (Buschinger & Schreiber 2002).

Being cryptic ants, very little is known about the biology and ecology of *Myrmecina*. Some species of *Myrmecina* show queen polyphenism, where two different phenotypes of reproductive females viz., intermorphic and gynomorphic, occur within the same species (Steiner *et al.* 2006; Klein *et al.* 2016). Grasso *et al.* (2020) reported a context-dependent behaviour in *M. graminicola* (Latreille, 1802), where the ant curls into a ball and rolls away, the first instance of such a behavioural attribute among the ants. *Myrmecina nipponica* Wheeler, 1906 and *M. flava* Terayama, 1985 collected from Japan were found to be predators of oribatid mites, the first instance of acarophagy among ants (Masuko 1994). Many authors have reported myrmecophilous interactions between oribatid mites and *Myrmecina* species (Aoki *et al.* 1994; Ito & Takaku 1994; Ito & Aoki 2003; Ito 2013). Some oribatids are obligate myrmecophiles while others are less specific in their interaction.

Currently, *Myrmecina* encompasses 98 valid species and 1 valid subspecies (Bolton 2020; AntWiki 2020). Its taxonomy has been studied in the Nearctic region (Smith 1948; Snelling 1965; Brown 1967; Deyrup 2015), China (Huang *et al.* 2008; Zhou *et al.* 2008), Australia (Shattuck 2009), Japan (Terayama 1996), Sundaland (Wong & Guénard 2016), Sumatra (Satria & Yamane 2019) and India (Sheela *et al.* 2020). More recently, in a taxonomic revision of the Southeast Asian species, forty new species were described, bringing the total number of species in the region to 53 (Okido *et al.* 2020).

Only five confirmed species of *Myrmecina* have been recorded from India so far: *M. urbanii* Tiwari, 1994 (Karnataka, Kerala, Orissa and Tamil Nadu); *M. vidyae* Tiwari, 1994, (Kerala); *M. striata* Emery, 1889 (Arunachal

Pradesh, Assam, Kerala, Meghalaya, Sikkim, and West Bengal); *M. camellia* Sheela, 2020 (Assam); and *M. narendra* Sheela, 2020 (Manipur) (Fig. 1. A; Bharti *et al.* 2016; Sheela *et al.* 2020). The dealate queen of *M. urbanii* was described from Karnataka by Varghese (2018). Though Smith (1858) reported *M. pilicornis* from Maharashtra, based on a male holotype, later Bingham (1903) examined the type specimen and confirmed it as a species of *Tetramorium*.

During our explorations of the Eastern Himalayas, we collected two species of *Myrmecina* from Mizoram in 2019 (Figs 1 A, 1 B). Among Indian states, Mizoram has the highest percent forest cover (85.41%) (FSI, 2019). It has tropical evergreen and semi-evergreen forests in the lower elevations and sub-tropical to montane subtropical vegetation in the high hills. Mizoram has rich floral and faunal diversity and forms a part of the Indo-Burma biodiversity hotspot region. The state shares its international boundaries with Bangladesh on the west and Myanmar on the east and south. Currently, Mizoram has 55 known species of ants in 33 genera (Bharti *et al.* 2016).

We describe two new species of *Myrmecina*, *M. bawai* sp. nov. and *M. reticulata* sp. nov. in this study which highlights the importance for further exploring the Eastern Himalayan region. *Myrmecina reticulata* sp. nov. is described here based on a single worker specimen. A considerable number of *Myrmecina* species are known from single specimens (Shattuck 2009; Sheela *et al.* 2020; Okido *et al.* 2020). This could be explained by the fact that ants in the hidden habitats are so hard to collect. However, single specimens that differ greatly in morphology from other species of the genus allow us to consider them as valid species. A key to all the known species of *Myrmecina* from India based on the worker caste is also provided.

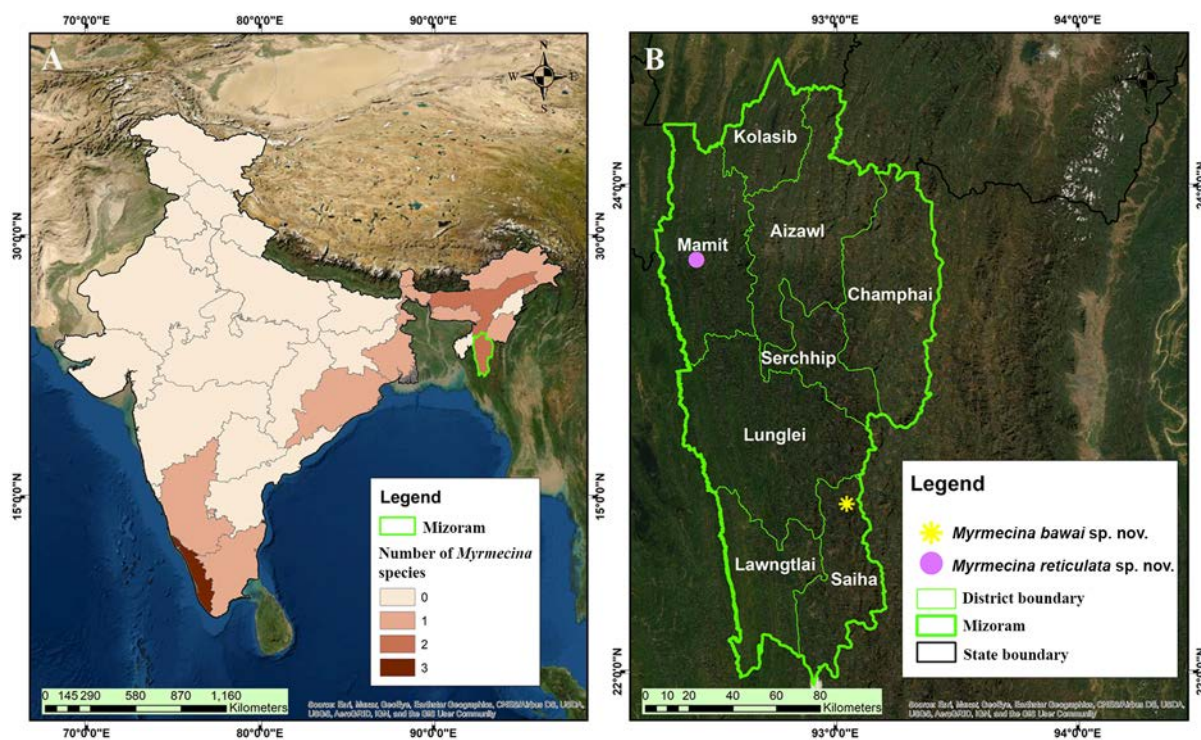


FIGURE 1. *Myrmecina* species distribution in India; A) Number of *Myrmecina* species by state; B) Type localities of the new species in Mizoram, Northeast India.

Materials and methods

Specimens were collected from Mizoram (India) by using the Winkler extraction method and pitfall traps (Bestelmeyer *et al.* 2000; Agosti & Alonso 2000). The collection sites include Dampa Tiger Reserve (Mamit district) and Phawngpui National Park (Lawngtlai district) (Figs 1 B). All the collected specimens were preserved in absolute alcohol prior to mounting. Specimens were point mounted and morphological characters were examined under Zeiss SteREO Discover.V8 microscope. The species identification was done by using available taxonomic keys and comparing specimens with known valid species of *Myrmecina*. Distinctive features used to confirm the new species status of collected material included body sculpture, body measurements, presence or absence of an anterior pair of

denticles on the propodeal dorsum and median tooth on the anterior margin of the clypeus. The species were compared with characters of the species proposed by Sheela *et al.* (2020) and Okido *et al.* (2020). All the specimens were imaged at 200× magnification and extended focus montage images were taken using a Keyence VHX 6000 digital microscope. Artefacts and unnecessary parts of the images were removed using Adobe Photoshop CC 2019[®]. Body measurements were taken with AxioVision 4.8 software (Carl Zeiss, Germany). All the measurements were taken in two decimal places in the software. Measurements and morphological terminology follow Wong & Guénard (2016), Jaitrong *et al.* (2019) and Satria & Yamane (2019). The Holotype specimens are deposited in the National Bureau of Agricultural Insect Resources (ICAR-NBAIR), Bangalore, India. The Paratype is deposited in the ant collection of ATREE Insect Museum, Bengaluru, India (AIMB). Abbreviations of measurements and indices are as follows:

- HL** Head Length. Maximum length of head in full-face view, measured from midpoint of a line drawn across the anteriormost points of clypeus to midpoint of a line drawn across the posteriormost points of head.
- HW** Head Width. Maximum width of head in full-face including eyes.
- MDL** Mandible Length. Maximum length of mandible measured from mandibular insertion to apical most point of mandible, in full-face view.
- EL** Eye Length. Maximum diameter of compound eye measured in profile view.
- SL** Scape Length. Maximum length of antennal scape excluding basal condylar bulb.
- TL** Total Length. Maximum length of specimen measured as the sum of head length + thorax, petiole and post-petiole length + gaster length.
- WL** Weber's Length. Maximum diagonal distance of mesosoma measured from anteriormost point of pronotal collar to posteriormost point of propodeal lobe in profile view.
- PNH** Pronotum Height. Maximum height of pronotum in profile view, measured from the posterior base of lateral side of pronotum where procoxa is attached to the highest point of the pronotum.
- PNW** Pronotum Width. Maximum width of pronotum measured in dorsal view.
- MW** Mesonotum Width. Maximum width of mesonotum measured in dorsal view.
- PSL** Propodeal Spine Length. Maximum length of propodeal spine measured in profile view from tip of propodeal spine to closer outward margin of propodeal spiracle.
- PTH** Petiole Height. Maximum height of petiole in profile view, measured from ventralmost point of subpetiolar process to imaginary line tangential to the apex.
- PTL** Petiole Length. Maximum length of petiole in profile view, measured from anterodorsalmost point to posterodorsalmost point of petiolar base.
- PTW** Petiole Width. Maximum width of petiole in dorsal view.
- PPH** Postpetiole Height. Maximum height of postpetiole in profile view, measured from ventralmost point of sternopostpetiolar process to imaginary line tangential to the apex.
- PPL** Postpetiole Length. Maximum length of postpetiole measured in profile view.
- PPW** Postpetiole Width. Maximum width of postpetiole in dorsal view.
- CI** Cephalic Index. Calculated as: $HW / HL \times 100$.
- MDI** Mandible Index. Calculated as: $MDL / HL \times 100$.
- SI** Scape Index. Calculated as: $SL / HW \times 100$.
- PI** Petiolar Index. Calculated as: $PTW / PTL \times 100$.
- PPI** Postpetiolar Index. Calculated as: $PPW / PPL \times 100$.

All the measurements are expressed in millimeters.

Results

Family Formicidae Latreille, 1809

Subfamily Myrmicinae Lepeletier de Saint-Fargeau, 1835

Tribe Crematogastrini Forel, 1893

Genus *Myrmecina* Curtis, 1829

Identification key to the Indian *Myrmecina* based on the worker caste (modified after Sheela *et al.* 2020)

1. In dorsal view, pronotum with transverse striations 2
- In dorsal view, pronotum with longitudinal striations or rugae 3
2. In profile view, anterodorsal part of propodeum with a pair of distinct denticles; propodeal spine curved upward apically; first gastral tergum smooth and shiny, anterior margin concave, sides sharply defined *Myrmecina urbanii* Tiwari, 1994
- In profile view, anterodorsal part of propodeum without denticles; propodeal spine slightly bent outward apically; first gastral tergum with dense punctation, anterior margin transverse, sides not sharply defined *Myrmecina vidyae* Tiwari, 1994
3. First gastral tergum smooth and shiny 4
- First gastral tergum sculptured 5
4. Body mainly reddish-brown; in profile view, anterior pair of denticles on propodeal dorsum large and prominent; anterior clypeal margin without a median process *Myrmecina narendra* Sheela, 2020
- Body mainly black; anterior pair of denticles absent on propodeal dorsum; anterior clypeal margin with a median process *Myrmecina striata* Emery, 1889
5. In dorsal view, longitudinal rugae on mesosoma diverging towards anterolateral portion of pronotum; first gastral tergum punctate *Myrmecina camellia* Sheela, 2020
- In dorsal view, longitudinal rugae on mesosoma extending towards anterior portion of pronotum; first gastral tergum punctulate or reticulate 6
6. Body mainly yellow with a dark tinge (Fig. 2 C); anterior margin of clypeus without a median tooth (Fig. 3 A); first gastral tergum with micro-punctures (punctulate) anteriorly, coarsely reticulate medially (Fig. 3 D) *Myrmecina bawai* sp. nov.
- Body mainly blackish brown (Fig. 4 C); anterior margin of clypeus with a distinct median tooth (Fig. 5 A); first gastral tergum entirely reticulate (Fig. 5 D) *Myrmecina reticulata* sp. nov.

Myrmecina bawai sp. nov.

(Figures 2–3)

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Material examined. Holotype: worker: “India: Mizoram, Phawngpui (Blue Mountain) National Park, Lawngtlai district, (22.6907°N, 93.0492°E, 1619 m), 17.iv.2019, Pitfall trap, Coll. Punnath Aswaj and Karunakaran Anoop” (NBAIR/HYM-FOR/9421). Paratype: 1 worker, data same as holotype, collected in another pitfall trap (AIMB/Hy/Fr 25003).

Measurements and indices. Holotype worker: HL—0.79, HW—0.80, MDL—0.46, EL—0.05, SL—0.49, TL—3.97, WL—1.06, PNH—0.45, PNW—0.56, MW—0.48, PSL—0.22, PTH—0.29, PTL—0.28, PTW—0.25, PPH—0.30, PPL—0.20, PPW—0.32, CI—101, MDI—58, SI—61, PI—89, PPI—160.

Paratype worker: HL—0.74, HW—0.71, MDL—0.41, EL—0.04, SL—0.48, TL—3.67, WL—0.95, PNH—0.37, PNW—0.50, MW—0.35, PSL—0.18, PTH—0.25, PTL—0.26, PTW—0.22, PPH—0.26, PPL—0.21, PPW—0.28, CI—96, MDI—55, SI—68, PI—85, PPI—133.

Diagnosis. *Myrmecina bawai* sp. nov. is unique in the following combination of characters: 1) small eyes (0.04–0.05 mm); 2) anterolateral corners of the median portion of clypeus with dentiform process; 3) absence of tooth like process on the middle anterior clypeal margin; 4) head and mesosoma with distinct rugae, the interspaces between rugae densely punctate; 5) presence of anterior pair of denticles on propodeal dorsum; 6) first gastral tergum punctulate anteriorly, coarsely reticulate medially; 7) yellow coloured body with a dark tinge.

Description. Head. In full face view, subrectangular with strongly concave occipital margin and weakly convex posterolateral margin (Fig. 2 A). Masticatory margin of mandible with large apical tooth followed by small preapical tooth, robust third tooth, five denticles and a blunt basal tooth (Fig. 3 A). Clypeus with distinctly convex posterior margin, anterior margin nearly straight, anterolateral corners of the median portion of the clypeus with dentiform process (Figs 2 A, 3 A). Antennae 12 segmented with three segmented club; antennal segment II pear-shaped; each segment of III–IX slightly shorter than broad; apical segment (XII) distinctly longer than segments X and XI combined. Scape almost reaching posterolateral corner of head. Eyes very small, 0.05 mm in diameter, located anteriorly at the lateral margin of head at a distance of 0.27 mm from the point of mandibular insertion (Fig. 2 A).

Mesosoma. In profile view, dorsal outline weakly convex, sloping backward; anterior ventrolateral corner of pronotum forming a very short tooth like process; mesonotum completely fused with pronotum; mesometapleural

suture is feebly visible through the cuticle. Propodeal dorsum weakly demarcated anteriorly; metanotal groove indistinct (Fig. 2 B). In profile view, propodeal dorsum has a small denticle on anterior part; propodeal spines longer than broad at base, curved up apically; propodeal declivity steep and strongly concave (Figs 2 C, 3 C).

Metasoma. In dorsal view, petiole longer than broad, almost parallel sides; postpetiole slightly broader than petiole, broader than long, semicircular, weakly concave anterior margin and distinctly convex posterior margin (Fig. 2 B). In profile view, petiole almost as long as high (excluding subpetiolar process); petiolar dorsal surface weakly concave; anterior slope nearly straight; narrow subpetiolar process with relatively broad anterior tip; postpetiole slightly elevated than petiole, almost as long as high (excluding sternopostpetiolar process); sternopostpetiolar process well developed, roundly convex ventral outline, straight anterior margin (Figs 2 C, 3 C). Gaster slightly elongate circular with strongly concave anterior margin (Fig. 3 D).



FIGURE 2. *Myrmecina bawai* sp. nov. worker, holotype; A) Head in full face view; B) Body in dorsal view; C) Body in profile view.

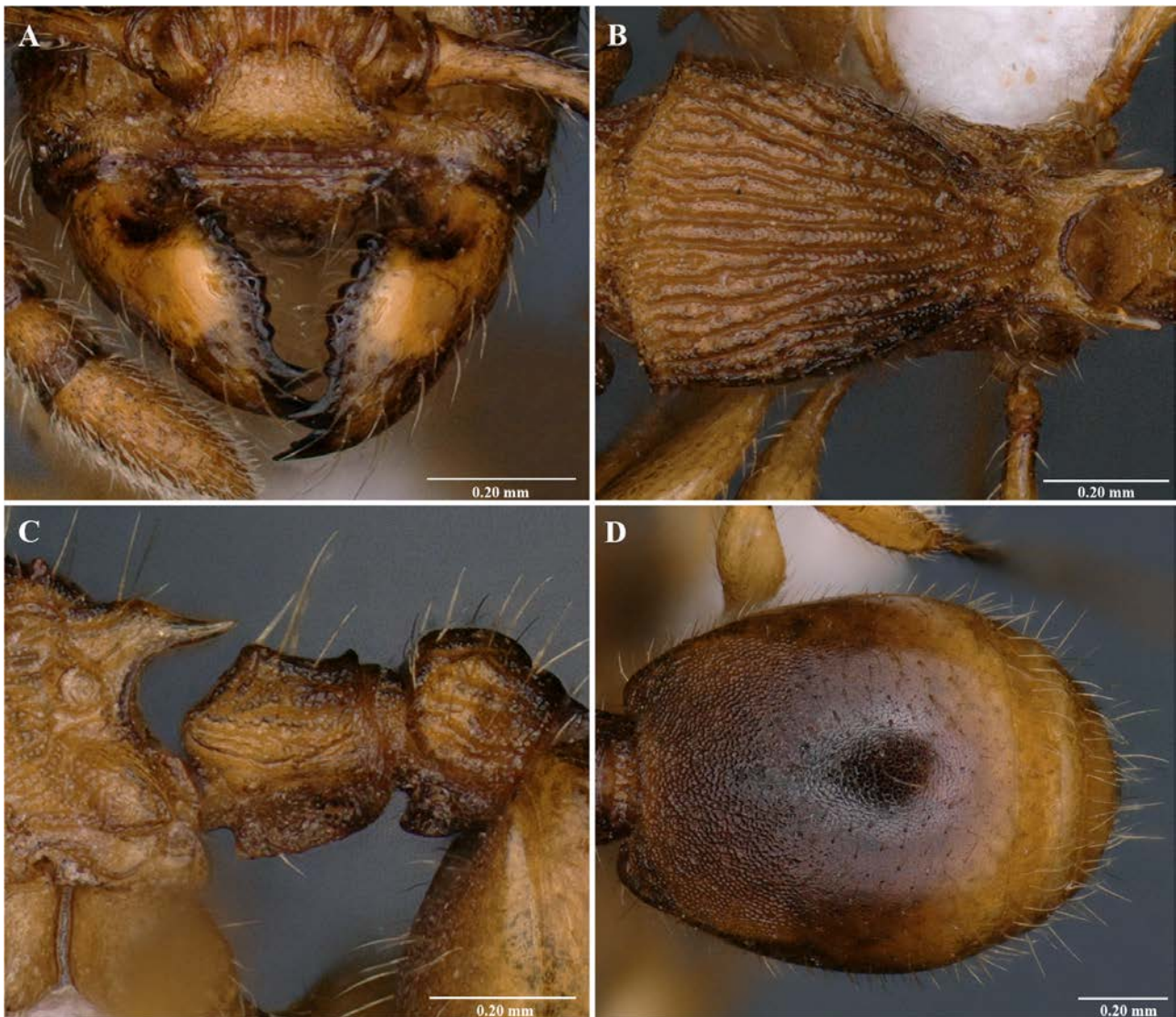


FIGURE 3. *Myrmecina bawai* sp. nov. worker, holotype; A) Clypeus and mandibles; B) Mesosoma in dorsal view; C) Denticle on propodeal dorsum, propodeal spine, petiole and postpetiole in profile view; D) First gastral tergum in dorsal view.

Sculpture: Dorsum of head with distinct rugae, running posterolaterally, interspaces between rugae densely sculptured (Fig. 2 A). Mandible smooth and shiny. Mesosoma dorsally with longitudinal rugae, the rugae running continuously to lateral face (Figs 2 C, 3 B). Petiole and postpetiole dorsally and laterally with longitudinal rugae (Figs 2 C, 3 C). All the legs relatively smooth and shiny. First gastral tergum with micro-punctures (punctulate) anteriorly, coarsely reticulate medially; remaining gastral segments relatively smooth and shiny (Fig. 3 D).

Pilosity: Body with abundant long erect hairs. Antenna with abundant suberect and erect hairs. Mandible with numerous thin and long hairs, basal masticatory margin with few spatulate hairs. Anterolateral corner of clypeus with two pairs of relatively large erect hairs and medially with a pair of relatively small erect hairs. All legs with dense suberect to erect hairs. Gaster with abundant erect to suberect hairs.

Colour. Dorsum of head, mesosoma and gaster yellow with a dark tinge. All other body parts yellow.

Ecology. Two workers of *Myrmecina bawai* sp. nov. were collected from Phawngpui National Park (Blue Mountain National Park), one specimen each in two pitfall traps 200 m apart. The protected area is named for the mountain Phawngpui, often called the Blue Mountain, which is the highest mountain peak in Mizoram (maximum altitude 2157 m above sea level). The park spreads over an area of 50 km² and covers the Blue Mountain along with the surrounding reserve forest. The park consists of sub-tropical broadleaf and tropical evergreen forest. The annual rainfall is approximately 2500 mm and temperature ranges from 2 °C to 30 °C. The type locality is a shaded region with about 70% canopy cover.

Etymology: As Ashoka Trust for Research in Ecology and the Environment (ATREE) is celebrating its 25th anniversary in 2021, this species is named in honour of its founder president Prof. Kamaljit S. Bawa, renowned evolutionary ecologist and conservation biologist.

Identification. *Myrmecina bawai* sp. nov. is close to *Myrmecina taiwana* Terayama, 1985 in body colour, relatively small eyes, absence of tooth like process on the middle anterior clypeal margin and presence of anterior pair of denticles on the propodeal dorsum. However it differs from *M. taiwana* by the following characteristics: 1) head and mesosoma with distinct rugae, the interspaces between rugae densely punctate in *M. bawai* (head and mesosoma with longitudinal rugose sculpture in *M. taiwana*); 2) a dentiform process is present on anterolateral corners of the middle portion of the clypeus in *M. bawai* (dentiform process on anterolateral corner of the middle portion of the clypeus absent in *M. taiwana*); 3) first gastral tergum punctulate anteriorly, coarsely reticulate medially in *M. bawai* (gaster smooth in *M. taiwana*); 4) large size, HW 0.80, TL 3.73 in *M. bawai* (small size HW 0.59–0.61, TL 2.62–2.73 in *M. taiwana*).

Myrmecina reticulata sp. nov.

(Figures 4–5)

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Material examined. Holotype: worker: “India: Mizoram, Dampa Tiger Reserve, Mamit district, (23.6948°N, 92.4283°E, 409 m), 25.iv.2019, Winkler extraction method, Coll. Punnath Aswaj and Karunakaran Anoop” (NBAIR/HYM-FOR/9424).

Measurements and indices. Holotype worker: HL—0.68, HW—0.63, MDL—0.36, EL—0.05, SL—0.47, TL—2.71, WL—0.82, PNH—0.34, PNW—0.45, MW—0.35, PSL—0.20, PTH—0.22, PTL—0.21, PTW—0.19, PPH—0.21, PPL—0.18, PPW—0.24, CI—93, MDI—53, SI—75, PI—91, PPI—133.

Diagnosis. *Myrmecina reticulata* sp. nov. belongs to *Myrmecina gracilis* complex as it has small eyes (<0.12 mm), flattened mesosoma, long and posteriorly directed propodeal spine, first tergum with concave anterior margin in dorsal view and sculptured dorsum. The species is unique in having the following characters: 1) head and mesosoma with longitudinal rugae; 2) anterior margin of clypeus with a prominent median tooth like process; 3) propodeal dorsum has a distinct short and triangular denticle located anteriorly; 4) propodeal spines longer than broad at base, anterodorsal margin medially elevated, slightly sloping to sides and curved up apically; 5) sternopostpetiolar process not well developed, blunt; 6) first gastral tergum reticulate; 7) body blackish brown.

Description. Head. In full face view, subrectangular with posterior margin strongly concave medially, weakly convex posterolateral margin; slightly longer than broad (Fig. 4 A). Mandibles broad, masticatory margins with large apical tooth followed by medium size preapical tooth, third tooth robust, four denticles and a distinct basal tooth (Fig. 5 A). Anterior margin of clypeus with a distinct median tooth; anterolateral corners of the median portion of the clypeus with a pair of denticles (Fig. 4 A). Antenna 12-segmented, with distinct 3-segmented club; scape not extending beyond occipital corner; antennal segment II pear-shaped; segment III–IX slightly shorter than broad; terminal segment (XII) longer than segments X and XI combined. Eyes very small, 0.05 mm in diameter, located anterolateral to mid-length of the head at a distance of 0.21 mm from the point of mandibular insertion (Fig. 4 A).

Mesosoma. In profile view, mesosoma weakly convex; anterior ventrolateral corner of pronotum dentate, but it is not developed as a spine; pronotum completely fused with mesonotum; the ventral margin of the mesopleural area is delimited from the metapleural area by a distinct notch (Fig. 4 C). Propodeum weakly demarcated anteriorly; but lack a distinct metanotal groove. In profile view, propodeal dorsum has a distinct short and triangular denticle located anteriorly; propodeal spines clearly longer than broad at base, anterodorsal margin medially elevated, slightly sloping to sides and curved up apically (Fig. 5 C). Propodeal declivity steep and shallowly concave; posterodorsal corner of propodeal lobe right angle, posteroventral margin of the lobe weakly convex (Fig. 4 C).

Metasoma. In dorsal view, petiole slightly longer than broad, almost parallel sides (Fig. 4 B). In profile view, petiole almost as long as high (excluding subpetiolar process); petiolar dorsal surface weakly concave, anterior slope nearly straight; narrow subpetiolar process with relatively pointed anteroventral corner (Figs 4 C, 5 C). In dorsal view, postpetiole broader than petiole, clearly shorter than broad, its anterior margin moderately concave while posterior margin distinctly convex (Fig. 4 B). In profile view, postpetiole almost as long as high; sternopostpetiolar process not well developed (Fig. 5 C). Gaster in dorsal view, slightly elongate circular with strongly concave anterior margin (Fig. 5 D).



FIGURE 4. *Myrmecina reticulata* sp. nov. worker, holotype; A) Head in full face view.; B) Body in dorsal view; C) Body in profile view.

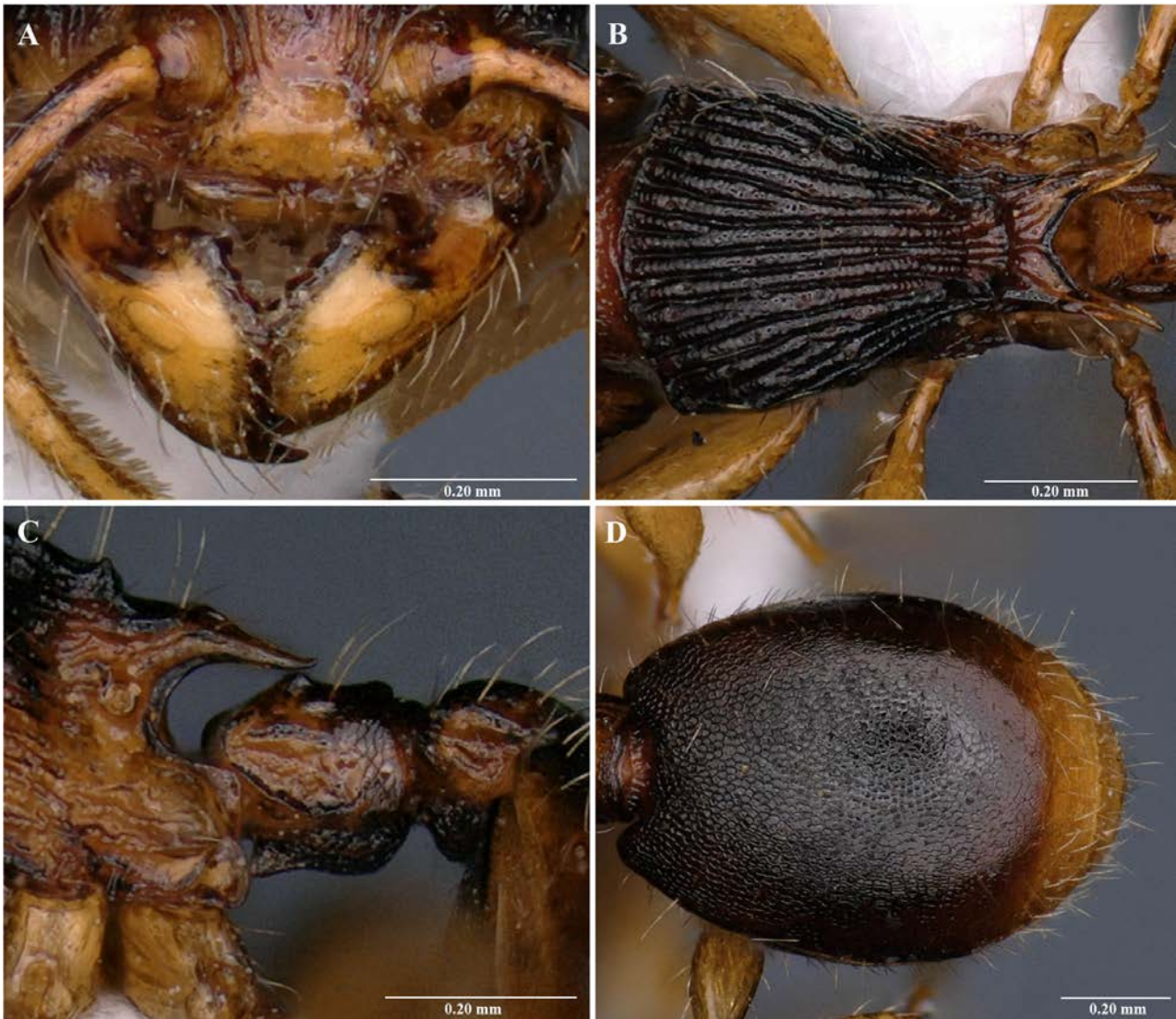


FIGURE 5. *Myrmecina reticulata* sp. nov. worker, holotype; A) Clypeus and mandible; B) Mesosoma in dorsal view; C) Denticle on propodeal dorsum, propodeal spine, petiole and postpetiole in profile view; D) First gastral tergum in dorsal view.

Sculpture: Dorsum of head with distinct longitudinal rugae (Fig. 4 A). Ventrolateral area of head (temple + gena) with longitudinal rugae. Mandible smooth and shiny. Clypeus largely smooth (Figs 4 A, 5 A). Mesosoma with parallel longitudinal rugae, diverging towards anterior portion of pronotum (Fig. 5 B). The sculpture of the meso- and metapleural areas is distinct, with the break point aligned with the pleural suture. Dorsal surface of petiole relatively smooth anteriorly and posteriorly, punctured medially and laterally with few distinct rugae (Figs 4 B, 4 C, 5 C). Postpetiolar dorsum punctured with rugae (Fig. 4 B). All legs smooth and shiny. First gastral tergum entirely reticulate (Fig. 5 D); remaining gastral segments smooth and shiny.

Pilosity: Body covered with abundant erect hairs. Antenna with abundant suberect to erect hairs. Mandibles with many suberect hairs, basal masticatory margin with few spatulate hairs. Anterolateral corner of clypeus with 4–5 relatively large erect hairs and medially with two small erect hairs. Legs with numerous suberect to erect hairs. Gaster with abundant suberect to erect hairs.

Colour: Antennae, clypeus, mandible, 2/3 of mesopleura and propodeum laterally are yellowish brown. All legs, anterolateral corner of head below eyes, gastral segments 2–4 are yellow. A distinct yellowish colour separation present laterally between blackish brown first gastral tergum and sternum. Petiole yellowish dorsally and brownish medially. Postpetiole and lateral side of petiole are yellowish brown. Cephalic dorsum, mesosoma, first gastral segments are blackish brown.

Ecology. The collection site sits in the tropical semi-evergreen and evergreen forest, being a shaded spot with

about 80% canopy cover in the Dampa Tiger Reserve at an elevation of 409 m above sea level. The annual rainfall ranges from 2000 mm to 2500 mm and temperature ranges from 12 °C to 25 °C during winter and 22 °C to 35 °C during summer. A single worker specimen of *M. reticulata* **sp. nov.** was collected using a Winkler extractor from sifted leaf litter taken from one square meter which accounted for 1000 ml of leaf litter. We were able to capture three additional ant genera: *Meranoplus*, *Lasius* and *Carebara* from the same trap.

Etymology. The species is named in reference to the reticulate sculpture on the first gastral tergum.

Identification. *Myrmecina reticulata* **sp. nov.** is close to *M. bawai* **sp. nov.** in the following characters: 1) meosoma in dorsal view with parallel longitudinal rugae; 2) anterior pair of denticles present on the propodeal dorsum; 3) first gastral tergum in dorsal view sculptured. However, *M. reticulata* **sp. nov.** can be easily separated from *M. bawai* **sp. nov.** by the following characteristics: 1) body mainly blackish brown in *M. reticulata* (dorsum of head, mesosoma and gaster yellow with a dark tinge. All other body parts yellow in *M. bawai*); 2) anterior margin of the clypeus with a distinct median tooth in *M. reticulata* (anterior margin of the clypeus without a median tooth in *M. bawai*); 3) propodeal spines long, distinctly broader than long in *M. reticulata* (propodeal spine short, nearly as broad as long in *M. bawai*); 4) sternopostpetiolar process not well developed, blunt in *M. reticulata* (sternopostpetiolar process well developed, triangular with acute anteroventral corner in *M. bawai*); 5) first gastral tergum in dorsal view, reticulate anteriorly, coarsely reticulate posteriorly in *M. reticulata* (first gastral tergum anteriorly with micro-punctures, coarsely reticulate medially in *M. bawai*).

Discussion

With this study, there are seven known Indian *Myrmecina* species. Out of these seven, *M. striata* is the only species with a known widespread distribution, occurring in India, Myanmar, Sri Lanka and China. Other Indian species are confined to their type locality. In the Indian mainland, the genus has been reported only from the southern and north-eastern part. Previously, *Myrmecina striata*, *M. camellia* and *M. narendra* were the only species known from Northeast India, and no *Myrmecina* had been recorded from the state of Mizoram. Thus the present discovery of two new species marks the first record of the genus from the state, pointing to the need for extensive studies on the ant fauna in this region. Extensive exploration of the Eastern Himalayan region in the future, especially by using non-conventional collection methods such as Winkler traps, would definitely increase the number of *Myrmecina* species (Marathe & Rajan 2018).

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