



Lophomyrmex terraceensis, a new ant species (Hymenoptera: Formicidae) in the *bedoti* group with a revised key

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ABSTRACT

Lophomyrmex terraceensis sp. nov. is described from India. This species belongs to the *bedoti* group of the genus *Lophomyrmex*, which is characterized by a pronotum with lateral irregular marginations. The new species can be separated from other species within this group by the presence of sub-parallel, blunt and thick propodeal spines of almost uniform diameter and by an obliquely truncate petiolar node.

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Introduction

Lophomyrmex Emery is a small genus within the subfamily Myrmicinae, which is represented by 11 species from the Oriental and Indo-Australian regions (Bolton, 2011) and six of which are known from India (Bharti, 2011). A broad systematic treatment/revision of this genus was carried out by Rigato (1994). In this revision, Rigato (1994) transferred *Lophomyrmex* from the tribe Pheidologetonini to Pheidoloini and recognized two broad species groups, the *bedoti* and *quadriscopinosus* species groups. The *bedoti* group is characterized by having a pronotum with lateral irregular marginations, whereas the *quadriscopinosus* group is characterized by two anterodorsal pronotal teeth. Of the 11 known species, six (*L. ambiguus* Rigato, 1994, *L. bedoti* Emery, 1893, *L. changlangensis* Sheela and Ghosh, 2008, *L. longicornis* Rigato, 1994, *L. lucidus* Menozzi, 1930, *L. striatulus* Rigato, 1994) belong to the *bedoti* group while five species (*L. birmanus* Emery, 1893, *L. kali* Rigato, 1994, *L. opaciceps* Veihmeyer, 1922, *L. quadriscopinosus* Jerdon, 1851, and *L. taivanae* Forel, 1912) belong to the *quadriscopinosus* group. *Lophomyrmex terraceensis* sp.nov., which is reported here as new to science, belongs to the *bedoti* group.

Materials and methods

This new species was collected from an intact *Eucalyptus* forest near the village of Terrace (31.9234°N, 75.9294°E, 420 m alt.), Himachal

Pradesh state, India. This area is semi-arid and falls within the lower Shivalik range of the north-western Himalayas. The forest has thick leaf litter. Ants were collected from leaf litter with a Winkler's extractor and preserved in 70% alcohol. The material was analyzed using a Nikon SMZ-1500 stereo zoom microscope. An MP evolution digital camera was used on this microscope for digital images with Auto-Montage (Syncroscopy, Division of Synoptics, Ltd., Cambridge, UK) software. Later, images were processed using Adobe Photoshop CS.

Abbreviations for the type depositories are as follows: BMNH, The Natural History Museum, London, U.K.; PUPAC, Punjabi University Patiala Ant Collection, Patiala, India.

Measurements and indices

Measurements and indices follow Bolton (1987) and Rigato (1994). These include:

¹Mesosomal length (ML): The diagonal length of the mesosoma in profile from the point at which the pronotum meets the cervical shield to the posterior base of the metapleuron.

Eye length (EL): Maximum length of eye measured in the same view as HL.

Gaster length (GL): Maximum length of gaster on lateral view from the anteriormost point of first gastral segment to the posterior most point (excluding the stinger).

Head length (HL): The length of the head proper, excluding the mandibles, measured in a straight line from the midpoint of the

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¹ The new term "Mesosoma" is used instead of "Alitrunk", which is an old term.

anterior clypeal margin to the midpoint of the occipital margin, in full-face view, ignoring any projecting teeth that may be present on the clypeus. In species where the occipital margin or the clypeal margin (or both) is concave, the measurement was taken from the midpoint of a transverse line spanning the anterior most or posterior most projecting points, respectively.

Head width (HW): The maximum width of the head in full-face view, measured behind the eyes.

Hind tibia length (HTL): The length of the hind tibia excluding its more proximal portion i.e., the “knee”, which is concealed by the apex of the femur when the leg is fully straightened.

Petiole height (PTH): Maximum height of the petiole on lateral view.

Petiole length (PTL): Maximum length of the petiole on dorsal view.

Petiole width (PTW): Maximum width of the petiole on dorsal view.

Postpetiole height (PPTH): Maximum height of postpetiole on lateral view.

Postpetiole length (PPTL): Maximum length of the postpetiole on dorsal view.

Postpetiole width (PPTW): Maximum width of the postpetiole on dorsal view.

Pronotal width (PW): Maximum width of the pronotum on dorsal view.

Propodeal spine length (SpL): (slightly oblique to the body axis), the straight dorsal distance from the base of the spine to its apex with the spine in full lateral view. The base of the spine was arbitrarily considered the midpoint of the concavity where the propodeal dorsum and spine meet.

Propodeal spinal distance (SpD): The maximum distance between the tips of the propodeal spines.

Scape length (SL): The maximum straight line length of the antennal scape excluding the basal constriction or neck close to the condylar bulb.

Cephalic index (CI): $(HW/HL) \times 100$

Propodeal spinal length index (SpLI): $SpL/HW \times 100$

Scape index (SI): $(SL/HW) \times 100$

Tibial index (TI): $(HTL/HW) \times 100$

Total length (TL): The sum of the HL, ML, PTL, PPTL, and GL.

Description

Lophomyrmex terraceensis sp. nov. (Fig. 1)

Types. Holotype: worker from leaf litter, 420 m alt., Terrace village (31.9234°N, 75.9294°E), Kangra District, Himachal Pradesh, India, 10.v.2004 (coll. H. Bharti, PUPAC). Paratype: 1 worker from the same site, 25.v.2009 (coll. R. Kumar, PUPAC).

Measurements. Holotype worker: TL 3.27 mm; HL 0.74 mm; HW 0.69 mm; SL 0.63 mm; EL 0.16 mm; PW 0.44 mm; PTW 0.16 mm; PPTW 0.25 mm; PPTH 0.22 mm; PTH 0.24 mm; PTL 0.33 mm; PPTL 0.22 mm; SpL 0.22 mm; SpD 0.29 mm; HTL 0.63 mm; ML 0.99 mm; GL 0.99 mm; CI 93.24 mm; SI 91.3 mm; SpLI 31.88 mm; TI 91.3 mm.

Paratype worker: TL 3.14 mm; HL 0.75 mm; HW 0.71 mm; SL 0.63 mm; EL 0.16 mm; PW 0.44 mm; PTW 0.15 mm; PPTW 0.25 mm; PPTH 0.22 mm; PTH 0.24 mm; PTL 0.33 mm; PPTL 0.22 mm; SpL 0.24 mm; SpD 0.32 mm; HTL 0.63 mm; ML 0.97 mm; GL 0.87 mm; CI 94.67 mm; SI 88.73 mm; SpLI 33.8 mm; TI 88.73 mm (one measured).

Worker description (holotype and paratype). Head slightly longer than broad, sides convex, occipital margin slightly emarginate; mastigatory margin of mandibles with large apical and preapical teeth, third tooth slightly smaller than the preapical tooth followed by a series of denticles; clypeus convex, anterior clypeal margin with a



Fig. 1. *Lophomyrmex terraceensis* sp. nov., 1. Head in full-face view; 2. body, dorsal view; 3. body, lateral view.

protruding blunt tooth at the midpoint and this tooth with a strong seta on each side; antennae 11 segmented with distinct 3-segmented club; scape slender, narrow, reaching occipital margin of head; eyes situated at midlength of the sides of head, distance between the mandibular insertion and the anterior point of the eye is 1.3 times the maximum eye length, pronotal dorsum feebly convex; promesonotal suture absent; mesonotum sloping toward the propodeum, a well developed prominence present at its midlength; metanotal groove deep and narrow; propodeal lobes indistinct; propodeal spines very thick, essentially uniform in diameter, blunt, sub-parallel, projected rearward; petiole longer than broad, with long anterior peduncle, petiolar node clearly truncate as in *Lophomyrmex bedoti*, with steep anterior

face which meet the dorsal face at a distinct angle, postpetiole about 1.6 times wider than petiole.

Mandibles longitudinally costulate, rugulose; clypeus finely reticulate and somewhat shiny; frontal triangle shagreened and opaque; cephalic dorsum finely reticulate, dull, opaque; genae and frontal lobes with fine longitudinal rugulae, rugulae on the frontal lobes appear long, fragmented, reach occipital margin, pronotal dorsum reticulate with short rugulae, anterior slope is also feebly reticulate with fragmented transverse rugulae, sides shiny with very superficial longitudinal reticulations; mesonotum and mesopleuron more strongly reticulate; propodeum flat with reticulate sculpture; propodeal declivity smooth and shiny; petiole and postpetiole faintly reticulate; gaster superficially reticulate, shiny.

Head, mandibles, clypeus, pronotum, petiole, post petiole and gaster with numerous long erect hairs; eyes with subdecumbent pubescence; mesonotum with two pairs of short hairs, propodeum pubescent; body dark brown with head, legs and sides a shade paler.

Etymology. The species is named after its type locality.

Distribution. Himachal Pradesh, India.

Remarks. *Lophomyrmex terraceensis* sp.nov. is quite distinct from other species within the *bedoti* group. The relatively wide, thick, and blunt propodeal spines are unique to this species and easily separate it from its congeners. It is most similar to *L. ambiguus* and *L. bedoti* but the combination of several characters easily allows separation of these species. The unique shape of the propodeal spines, the high mesonotal prominence, the truncate petiolar node with its steep anterior face, which meets the dorsal face at a distinct angle, separate *L. terraceensis* from *L. ambiguus*. It is easily distinguishable from *L. bedoti* by the more pronounced sculpture on the head and pronotum, the unique shape of the propodeal spines and by larger eyes. The abundant hairs on the whole body of *L. terraceensis* separate it from *L. changlangensis*, which has only three or four pairs of hairs on its body. The more pronounced sculpture and 3.14–3.27 mm total length of this species distinguishes it from *L. lucidus*, which has a smooth sculpture and a total length <2.8 mm. The short blunt propodeal spines (SpL ≤ 0.24 mm) and SI < 100 separates it from *L. longicornis* (with its very long and pointed propodeal spines (SpL > 0.34 mm), SI > 100, and no erect setae near the midline on the pronotum). Finally, this new species differs from *L. striatulus* by the absence of sharp propodeal spines, the short costula running backward from insertion of the humeral seta, and in the presence of a low prominence on the mesonotum.

Revised key to species of *Lophomyrmex bedoti* group (modified from Rigato, 1994)

1. On dorsal view, the anterior angles of pronotum with two distinct flattened horizontal teeth or spines directed anterolaterally (*quadrispinosus* group)
 - On dorsal view, pronotum with lateral irregular marginations only (*bedoti* group).....2
2. SI ≥ 100, SpL ≥ 0.34 mm. Pronotum in frontal view without a pair of anterior erect setae near the midline; mesonotum in profile at most with a few thin, short, oblique hairs (Brunei, E. Malaysia) *longicornis* Rigato
 - SI < 100, SpL < 0.34 mm. Pronotum in frontal view with a pair of anterior erect setae near the midline; mesonotum in profile with standing coarse hair.....3
3. Smooth and shiny; only the upper portion of the mesopleuron clearly reticulate. TL < 2.8 mm (W. Malaysia)..... *lucidus* Menozzi
 - The majority of the mesothorax and propodeum with distinct reticulation. TL often > 3 mm4

4. Sculpture less developed; pronotal sides and head surface behind and below the eyes shiny or at most faintly sculptured. Eyes smaller and in lateral view the distance between their anterior margin and the mandibular insertion is ≥ 1.5 times the maximum eye length. Propodeal spines in lateral view thinner, appearing longer and very straight. Petiolar node clearly obliquely truncate: the steep anterior face and the flat dorsum meeting at a distinct, sometimes slightly protruding, angle (Sri Lanka, India, Burma, Malaysia, Singapore, Brunei, Indonesia, Philippines)..... *bedoti* Emery
 - Sculpture more developed: pronotal sides or head surface behind and below the eyes always at least superficially sculptured, not fully shiny. Eyes larger and in lateral view the distance between their anterior margin and the mandibular insertion is usually < 1.5 times maximum eye length. Propodeal spines in lateral view more gradually narrowing towards their tips or thick and blunt along their entire length and appearing shorter and not very straight. Petiolar node either somewhat rounded or truncate5
5. On lateral view the pronotum costulate with at least one longitudinal anterior, short costula running backward from the insertion of the humeral seta. In full-face view head usually more clearly rugulose in the space between the inner margin of the eyes and the frontal lobes (the rugulae are more easily visible in oblique view) (Thailand)..... *striatulus* Rigato
 - On lateral view the pronotum is not longitudinally costulate; no costulae running backward from the insertion of the humeral seta. Head either with or without rugulae in the space between the inner margin of the eyes and the frontal lobes6
6. Propodeal spines very long (SpL 0.26 mm, SpLI 36.11 mm); distance between eyes and base of mandibles 1.2 times eye length; 3 or 4 pairs of setae on head, mesosoma and pedicel (India)..... *changlangensis* Sheela and Ghosh
 - Propodeal spines short (SpL 0.20–0.24 mm, SpLI 30.00–33.80 mm); distance between eyes and base of mandibles 1.3 times eye length; numerous hairs on head, mesosoma and pedicel.....7
7. Head usually without rugulae in the space between the inner margin of the eyes and the frontal lobes. Petiolar node somewhat rounded, propodeal spines pointed (India, Nepal)..... *ambiguus* Rigato
 - Head with rugulae in the space between the inner margin of the eyes and the frontal lobes. Petiolar node clearly obliquely truncate, propodeal spines thick, blunt, sub-parallel, and of almost uniform diameter (India) *terraceensis* sp.nov.

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