

Research Article

New record of the Ponerine ant *Buniapone amblyops* (Emery, 1887) (Hymenoptera: Formicidae) from Nepal

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Abstract

Buniapone Schmidt & Shattuck 2014 is a monotypic and morphologically distinct hypogeic ant genus found only in Southern and Southeast Asia. The Ponerine ant *Buniapone amblyops* (Emery 1887) has been recorded for the first time from Nepal. The specimen was hand-collected in Pokhara (28.21361111 N, 83.97222222 E, 840 m asl) from animal dung on the ground. Morphological characteristics of Nepalese *B. amblyops* worker, distribution, and ecology are discussed.

Keywords: Hypogeic, Monotypic, *Pachycondyla*, Ponerinae, Worker description

1 | Introduction

Buniapone Schmidt & Shattuck 2014 is a monotypic ant genus belonging to the *Odontomachus* genus-group of the tribe Ponerini. These ants

Buniapone is a morphologically distinct genus with long and narrow toothed mandibles, blunt medial clypeal projection, significantly reduced eyes, obsolete metanotal groove, ovoid propodeal spiracles, complex metapleural gland opening, and squamiform petiole, among other features (Schmidt & Shattuck 2014). *Buniapone* workers closely resemble *Centromyrmex* and *Myopias*. In contrast to *Buniapone*, *Centromyrmex* has no eyes and no rectangular protrusion on the anteromedian margin of the clypeus, whereas *Myopias* has pronounced metanotal grooves dorsally and a thick petiolar node in lateral view (Eguchi et al. 2014).

There has been very little research on Nepalese ants to date. Ponerine ants are currently represented by ten genera and 14 named species in Nepal (Subedi et al. 2020, 2021; Adhikari et al. 2020). This paper reports *B. amblyops* from Nepal for the first time and discusses morphological characters of worker, distribution, and ecology.

are found only in Southern and Southeast Asia, from southern China to the islands of southern Indonesia, and west to India (Schmidt & Shattuck 2014). The taxonomic history of *Buniapone amblyops* (Emery 1887) is likely to be the most complicated of any ponerine. Emery (1887) first described it as *Ponera amblyops* from Sumatra, then it was shifted to *Trapeziopelta* Emery (1889), *Belonopelta* (Emery 1897), *Pachycondyla* (Emery 1900), *Pseudoponera* (Bingham 1903), *Euponera* (Forel 1905), *Pachycondyla* (Brown, 1995) and finally, Schmidt and Shattuck (2014) designated *Buniapone* as a new genus containing only one species.

2 | Materials and methods

The Nepalese record is based on a single worker collected by the author during opportunistic ant collections in Pokhara, Nepal in 2006. The morphological examination and the morphometrics of point-mounted *Buniapone* specimen were done with a Coslab MSZ-115 zoom stereo microscope under suitable magnifications. The measurements were taken using an ocular micrometer, and the results are presented to the nearest two decimal points. Under the same microscope, digital photos were captured using a Samsung SM-M625F digital camera. Because no morphometric data for *Buniapone amblyops* has been published in earlier publications, this paper on new distribution record opts to include worker description and morphometric measurements, which will further be useful in distinguishing this species from its subspecies *B. amblyops oculator*. Specimen will be deposited at the Central Department Zoology Museum of Tribhuvan University (CDZMTU). The collection locality of the specimen is provided in the Land cover map of Nepal available at arcgis.com (Karra et al. 2021) using QGIS 3.16 (QGIS Development Team 2020). The keys in Schmidt and Shattuck (2014) were used for generic identification, and worker descriptions in Bingham (1903), Schmidt and Shattuck (2014), Eguchi et al. (2014), and comparison with images of type specimens available at AntWeb (2021) were used for species identification.

Measurements and indices: Morphological terminology for measurements (in millimeters) and indices follows Bolton (1975), Fisher and Smith (2008):

FL – Femur length. The maximum length of the hind femur.

HL – Head Length. The straight-line length of the head in full-face view, excluding the mandibles.

HW – Head Width. The maximum width of the head in full-face view, excluding the eyes.

ML – Mandible length. The straight-line length of the mandible in full-face view.

PL – Petiole Length. The maximum length of the petiole in the dorsal view, from the anterior margin to the posterior margin.

PW – Petiole Width. The maximum width of the petiole measured in the dorsal view.

PrW – Pronotum width. The maximum width of the pronotum in the dorsal view.

SL – Scape Length. The straight-line length of the antennal scape, excluding the basal constriction or neck.

TL – Total Length. The total outstretched length of the ant from the mandibular apex to the gastral apex.

WL – Weber's length (Mesosoma length). The mesosomal length in lateral view, diagonal length from posteroventral corner of propodeum to the farthest point on the anterior face of pronotum, excluding the neck.

CI – Cephalic Index. $HW/HL \times 100$.

MI – Mandible Index. $ML/HL \times 100$.

SI – Scape Index. $SL/HW \times 100$.

3 | Results

Buniapone amblyops was discovered for the first time in Nepal. The morphometrics, worker description, distribution, and ecology of the newly discovered species are discussed below. With the addition of this species, Nepal now has ten genera and 15 named species of the subfamily Ponerinae.

Buniapone amblyops (Emery 1887)

Type locality: Sumatra (Indonesia)

Material examined: One worker, Pokhara, Kaski district, Nepal, 28.21361111 N, 83.97222222 E, 840 m, hand collection from animal dung, 18.vii.2006, IP Subedi leg.

Morphometric data of the worker: TL 7, HW 1.25, HL 1.31, ML 1.10, PL 0.38, PW 0.5, SL 1.06, WL 2.19, PrW 0.81, FL 1.06 **Indices:** CI 95.42, MI 83.97, SI 84.8.

Worker description: Worker of the Nepalese *Buniapone* species shows the following characters (see also Bingham 1903, Eguchi et al. 2014, Schmidt & Shattuck 2014):

Head: Head slightly longer than width in full-face view, a little wider anteriorly than posteriorly, emarginate posteriorly, lateral corners convex, anteromedial clypeal projection short and broad, moderately large frontal lobes, antennal scrobe absent. Eyes extremely small and located anterior of the head midline, concolorous with the surface of the head. Mandibles long and narrow, longitudinally striate, with six prominent teeth on masticatory margin with long apical tooth. Antennae 12-segmented, antennal scape just surpasses posterior cephalic border.

Mesosoma, petiole and gaster:

Promesonotum slightly convex in profile view, metanotal groove absent, promesonotal suture distinct. Propodeum unarmed, dorsally narrow, propodeal spiracle ovoid. Petiole with no anterior peduncle, petiolar node squamiform, tall and narrow in profile view, subpetiolar process triangular, helcium projecting from near mid-height of the anterior face of the first gastral segment. Gaster elongate, weak girdling constriction between third and fourth abdominal segments. Ventral apex of the metatibia with a large pectinate and a small simple spurs, mesotibiae with a few stout setae present near tarsus, tarsal claws unarmed. Sting well-developed.

Sculpture, pilosity and coloration: Head and mesosoma very finely and densely punctured, sides of mesosoma with regular longitudinal striations. Body with sparsely scattered erect hairs. Head, pronotum and mesonotum with adpressed dense golden pubescence, gaster, antennae and legs with moderately dense pubescence. Body brownish orange in color, more or less uniformly colored.



Figure 1. *Buniapone amblyops* worker (a. Habitus in profile view, b. Habitus in dorsal view, c. Head in full-face view)

Distribution: Sumatra (Emery 1887 as *Ponera amblyops*), Java (Dalla Torre 1893 as *Trapeziopelta amblyops*), India (Forel 1900 as *Belonopelta amblyops*), Bangladesh, Myanmar, Java (Radchenko 1993 as *Pseudoponera amblyops*), Sikkim, Assam, through Burma and Tenasserim to the Malay Peninsula (Bingham 1903 as *Pseudoponera amblyops*), Thailand (Jaitrong & Nabhitabhata 2005 as *Pachycondyla amblyops*), China (Guenard & Dunn 2012), Vietnam (Eguchi et al. 2014), Singapore (Yong et al. 2017), Nepal (new record, Fig. 2).

Bionomics: *Buniapone* specimen was collected from animal dung on the ground along with *Dolichoderus*, *Brachyponera*, *Carebara* and *Pheidole* species.

4 | Discussion

Buniapone amblyops is the new record for Nepal. The species identification was determined following worker descriptions in Bingham (1903), Schmidt and Shattuck (2014), Eguchi et al. (2014), and comparison with type images (AntWeb 2021). Along with other morphological traits, Nepalese *Buniapone* workers are unique in having elongated mandible with six prominent teeth, sparsely distributed long erect hairs in the body, and exceptionally dense adpressed golden pubescence in the dorsum of head, pronotum, and mesonotum.

Buniapone is a member of the *Odontomachus* genus-group, which also includes the Nepalese Ponerine ant genera *Brachyponera*, *Leptogenys*, *Odontomachus*, *Odontoponera*, and *Pseudoneoponera*, however, most generic relationships within the group are poorly resolved (Schmidt & Shattuck 2014). *Buniapone* is morphologically distinct from all Nepalese Ponerine genera and very unlikely to be confused, but it shares some morphological similarities with *Centromyrmex* (*Plectroctena* genus-group). The morphological similarities are most likely be due to adaptations to their shared hypogeic habits. In *Buniapone* and *Centromyrmex*, helcium projects from near mid-height on the anterior face of the first gastral segment, in contrast to the majority of the Nepalese Ponerine genera. The worker of *Buniapone* can be easily distinguished from *Centromyrmex* by the presence of eyes, rectangular projection in the anteromedian clypeal margin and a complex metapleural gland orifice with two flaps, one anterior and one posterior to the orifice.

The ecology of *Buniapone* is largely unknown. The specimen was collected from animal dung on the ground alongside *Dolichoderus*, *Brachyponera*, *Carebara*, and *Pheidole* species, which were most likely foraging in the dung. They are exclusively

hypogeic and most likely predators; however, they are not exclusively carnivorous, and they may use nestmate recruitment to find food resources (Schmidt & Shattuck 2014). Their prey preferences are yet to be known clearly. These ants were collected from soil under a stone in Singapore (Yong et al. 2017). Brassard et al. (2020) found this species in the soil at the depth of 50 cm, along with *Pheidole*, *Carebara*, and *Solenopsis* within the same quadrat. Bharti et al. (2017) recorded them in the secondary forest, whereas Eguchi et al. (2014) collected them in well-developed forests by digging the ground.

Buniapone amblyops has been recorded from southern China to the islands of southern Indonesia, and west to northwestern Sivalik, India, with a record from Nepal connecting its south-eastern to north-western range expansion. Additional sampling efforts and ecological research might aid in discovering more hypogeic ant species from Nepal and elucidating their roles in soil ecosystems.

5 | Conclusions

The discovery of *Buniapone amblyops* brings the total number of Ponerine ants in Nepal to fifteen nominal species. The finding bridges the gap between its south-eastern and north-western range expansions. More research employing systematic

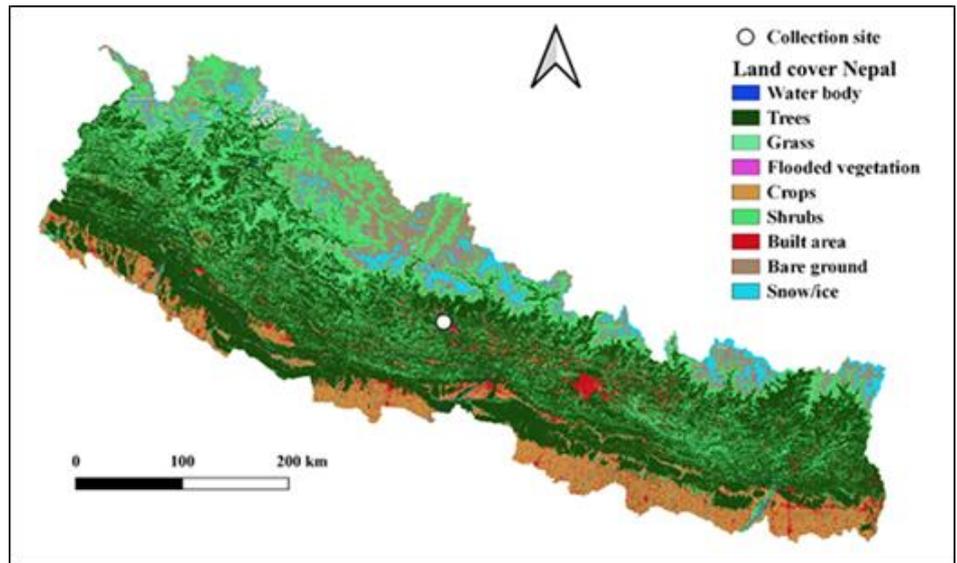


Figure 2. Land cover map of Nepal showing collection site of *Buniapone amblyops*

collecting methods might reveal more on their little-known ecology.

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Conflicts of interest

The author declares no conflict of interest.

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