

***Perissomyrmex monticola* n. sp., from Bhutan: the first natural record for a presumed Neotropical genus with a discussion on its taxonomic status**

C. BARONI URBANI and M.L. DE ANDRADE

Zoologisches Institut der Universität, Rheinsprung 9, CH-4051 Basel, Switzerland

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Perissomyrmex monticola n. sp. is described from Bhutan on three specimens, two workers and one dealate female. This is the second species of the genus. This genus has previously been recorded from Guatemala only. The discovery of *P. monticola* in Bhutan, as well as the probable phyletic relationships of the genus, strongly indicate that *Perissomyrmex* is not autochthonous to South America and that its natural distribution should be confined to the Old World. Hence, the previous Neotropical record should be explained by human introduction.

KEY WORDS: Hymenoptera, Formicidae, tramp species, Neotropical region, Oriental region, new taxa, Bhutan, Guatemala.

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INTRODUCTION

We present the description of the following new species of ants from Bhutan since we regard it of biogeographical and taxonomic relevance. The genus *Perissomyrmex* Smith 1947 — to which the new species belongs — has been known for nearly half a century on one single collection of presumed Guatemalan origin. Discovery of the second world species at nearly 3,000 m altitude in Bhutan renders the previous record very doubtful and suggests an Old World origin for this genus. This hypothesis will be tested in the present paper by an analysis of the probable relationships of the genus *Perissomyrmex*.

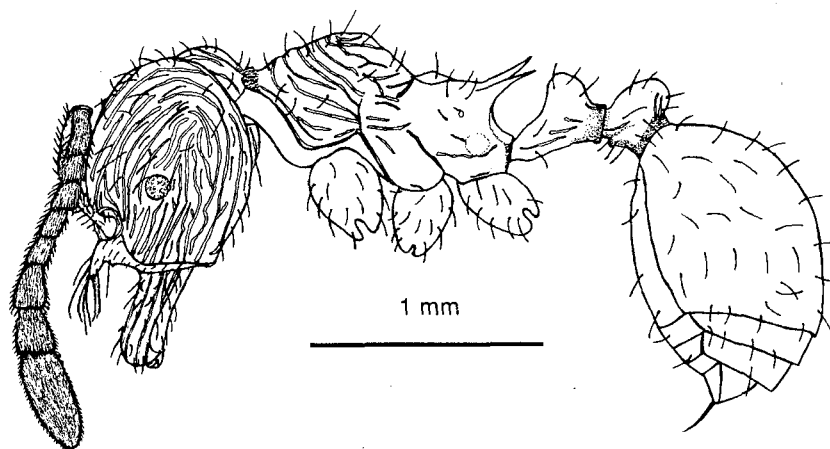


Fig. 1. — *Perissomyrmex monticola* de Andrade, holotype worker in lateral view.

***Perissomyrmex monticola* de Andrade n. sp. (Figs 1-3)**

Holotype. Worker, Nobding, 41 km E, of Wangdi Phodrang, 2800 m, Natural History Museum Basel Bhutan Expedition, 1972. Deposited in the collection of the Natural History Museum, Basel, Switzerland.

Paratypes. One worker missing the right antenna and the right second leg and one dealate female, same data and same collection as the holotype.

The specimens had actually been collected together with some workers of *Myrmica rugosa* s.l. from which they are virtually indistinguishable in size and colour without microscopic examination.

Derivatio nominis. From the Latin substantive *monticola* (= living on the mountains).

Diagnosis. A *Perissomyrmex* species in which the worker has no subpetiolar process, essentially smooth pleuron 2 and propodeum, and very lightly striate mandibles.

Worker. Measurements (in mm):

	Holotype	Paratype
Total length (mandibles included)	4.60	4.60
Head length	1.12	1.12
Head width	1.08	1.08
Scape length	0.92	0.96
Eye maximum length	0.12	0.12
Trunk length	1.24	1.24
Pronotum maximum width	0.64	0.64
Petiole length	0.44	0.44
Petiole maximum width	0.16	0.16
Postpetiole length	0.32	0.32
Postpetiole maximum width	0.20	0.20
Gaster width	0.96	0.96

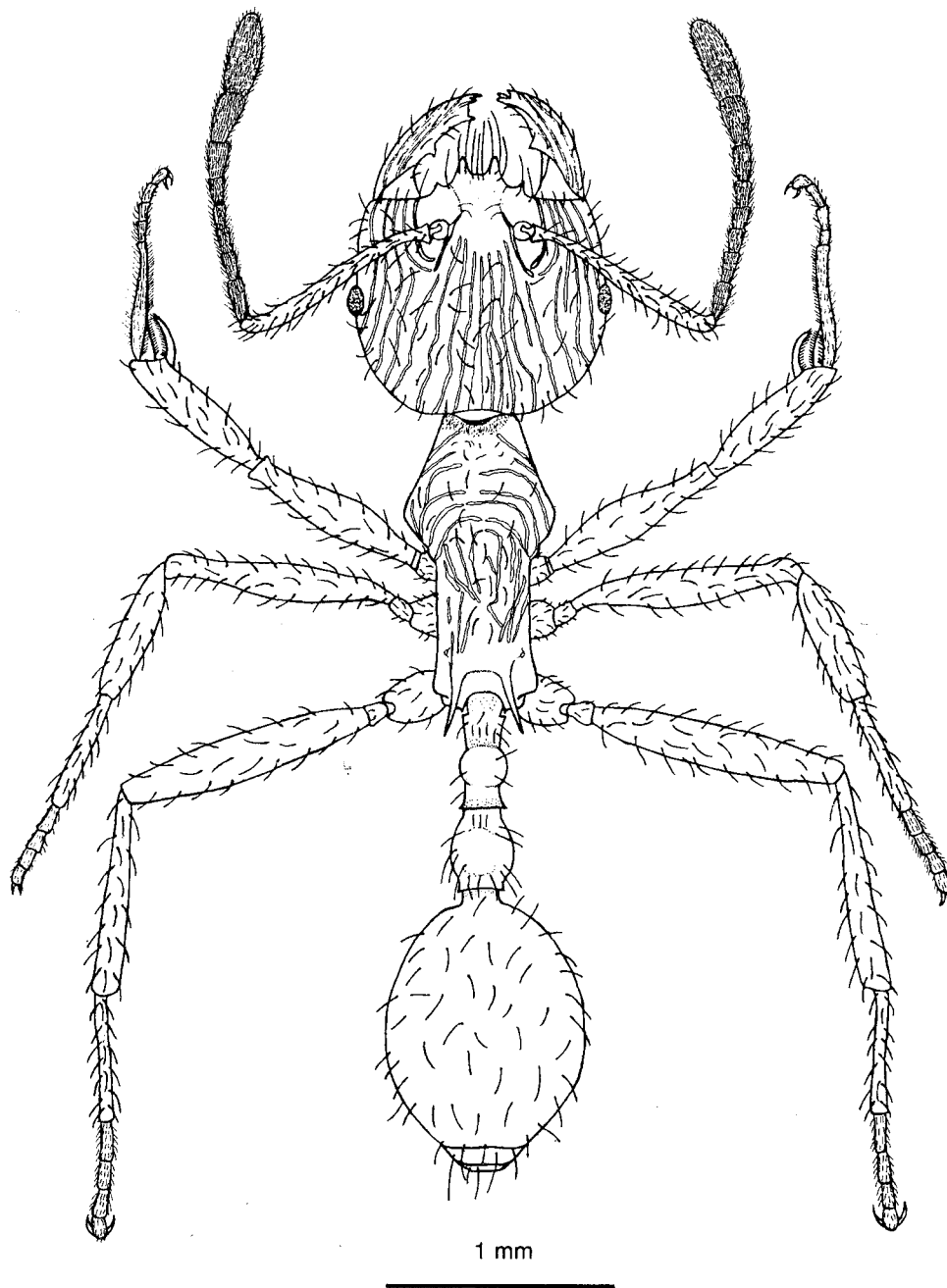


Fig. 2. — *Perissomyrmex monticola* de Andrade, holotype worker in dorsal view.

Indices (as currently employed in ant literature and as defined e.g. by BARONI URBANI 1978 and BOLTON 1981):

	Holotype	Paratype
Cephalic Index	96.4	96.4
Scape Index	85.2	88.8
Petiolar Index	36.4	36.4
Postpetiolar Index	62.5	62.5

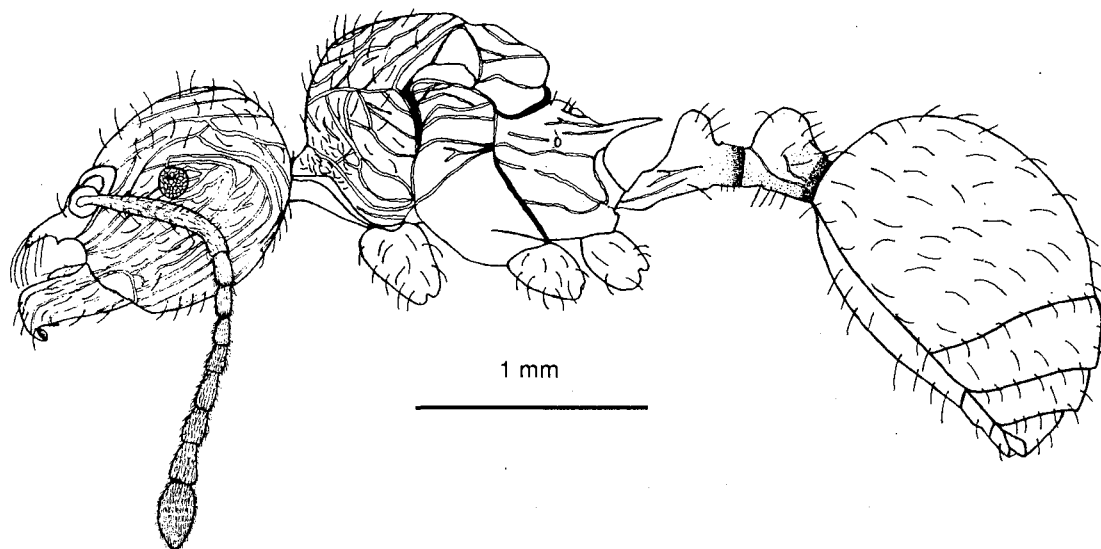


Fig. 3. — *Perissomyrmex monticola* de Andrade, paratype gyne in lateral view.

Description. Head large, with convex sides. No ocelli. Eyes protruding, at about the middle of the sides of the head, their maximum diameter ca equal to scape width. Frontal area subtriangular. Frontal carinae with a small lobe leaving both the base of the scape and the antennal fossae exposed. Clypeus with four teeth on its anterior border: the central pair 3 times as large as the two external teeth. Funiculi 8-jointed with the last three joints enlarged to form a poorly distinct club, the last joint subequal in length to the first and second joints combined. Mandibles elongate, very lightly striate, with four teeth interpretable as: one basal, one median, one preapical, and one apical. The median tooth is separated by a wide diastema from the preapical tooth.

Trunk with a poorly distinguishable promesonotal suture. Propodeal impression well developed. Propodeum with a pair of sharp divergent spines directed backwards. Propodeal spiracles round, well visible. Posterior legs almost as long as the whole body. Middle and posterior tibiae without spurs.

Petiole about 3 times longer than broad, its node oval in dorsal view and rounded in profile. Subpetiolar process absent. Postpetiole equally round in profile, almost 1/3 broader than the petiole, approximately subequal in length and height.

Gaster round, with the first segment approximately 3 times longer than the sum of the remaining ones.

Sculpture. Head capsule and thorax heavily striate. Mandibles very lightly striate. Pleuron 2 and propodeum smooth. Petiolar and postpetiolar nodes smooth and with the dorsal and lateral portions very lightly striate. Legs and gaster smooth, completely without sculpture.

Colour dominantly shining brown, antennae, mandibles and legs shining yellowish.

Pilosity. Body hairs essentially of four different types: a) generalized body hairs, pointed and slender, ca 0.08-0.20 mm long, regularly distributed on most body surfaces except the sides of the trunk where they are missing; b) mandibular hairs,

very similar to the previous ones, but consistently slightly shorter; c) a row of macrochetae of variable length but longer than the remaining body pilosity, and located on the anterior border of the clypeus; d) a much more dense and minute appressed pilosity on the feet and on the funiculi.

Gyne. Measurements (in mm) and indices: total length (mandibles included) 5.32; head length 1.20; head width 1.20; scape length 1.00; eye length 0.16; trunk length 1.40; pronotum width 0.84; petiole length 0.48; petiole maximum width 0.20; postpetiole length 0.32; postpetiole maximum width 0.24; gaster width 1.20; Cephalic Index 100; Scape Index 83.3; Petiolar Index 41.6; Postpetiolar Index 75.0.

Besides the differences in size, very similar to the worker from which it differs essentially in the following characters that are obviously correlated with caste determination.

Head with three ocelli disposed on the vertices of an inverted triangle.

Trunk dorsally flat at the propodeal declivity. Promesonotal suture deep. Mesonotal disc circular. Scutellum constituted by two regions: a rectangular prescutellum, 3 times broader than long and an inverted triangular postscutellum, its maximum length about twice as long as the prescutellum.

Gaster round, with the first segment approximately 2 times longer than the sum of the remaining ones.

Colour. Head, trunk and abdominal pedicel shining dark brown, gaster shining brownish, antennae, mandibles and legs shining yellowish.

CONSIDERATIONS ON THE TAXONOMIC AND PHYLETIC POSITION OF *PERISSOMYRMEX*

The genus *Perissomyrmex* Smith 1947 was described on two workers and was attributed with some doubts to the tribe Myrmecini (subfamily Myrmicinae). Attribution to the tribe Myrmecini was later fully accepted by BOLTON (1981) who considered the monotypic genus *Perissomyrmex* to be most closely related to the Myrmecini *Pristomyrmex* Mayr 1866. Differences between the two genera are restricted essentially to the antennal segmentation (9 segments in *Perissomyrmex* as opposed to 11 in *Pristomyrmex*). The differences and strict relationships between the two genera can both be confirmed, at least partially, by the newly discovered Bhutanese species.

SMITH (1947), in the original description of *Perissomyrmex*, stressed differences in mandibular morphology as being among the most salient characters of the new genus. The dentition of *P. monticola* — as described in this paper — is very similar to that of the sole previously known species and this affinity supports SMITH's original diagnosis. The dentition of *Peryssomyrmex*, however, can be easily derived from that of *Pristomyrmex*.

We refer to BOLTON's (1981) generalized description of the *Pristomyrmex* dentition which states: «Apical... margin usually with 4 teeth arranged as apical + preapical + short diastema + 2 basals... [and]... An offset basal denticle... midway the basal margin»..., or ...«Less commonly the mandibles with 3 teeth only (apical + preapical + long diastema + single basal)», or with 5 teeth». Though we would be inclined to regard the offset basal denticle as the true first basal (although the problem is

essentially one of definition), it is clear that, accepting BOLTON's interpretation, we need only to postulate the secondary loss or gain of one basal tooth, to perfectly match the dentition of *Perissomyrmex* to that of *Pristomyrmex*. Regardless of the most correct tooth nomenclature, it is very probable that the *Perissomyrmex* buccal morphology can be interpreted as an apomorphic change selected on an unknown *Pristomyrmex*-like ancestor as an adaptation to an as yet unknown, specialized diet.

However, assuming, *Perissomyrmex* as originating from an unknown *Pristomyrmex*-like ancestor and as being characterized by the secondary reduction of antennal segmentation and mandibular dentition creates the risk of making *Pristomyrmex* paraphyletic.

Decisions on the true phyletic relationships between the two genera and on their apomorphies are particularly hard because of the lack of a world-wide modern revision including all taxa potentially involved. At least tentatively, we would like to hypothesize that reduction of the antennal joints probably occurred only once among members of the tribe Myrmecini. We assume a morphocline decrease in the number of antennal joints from the basic stock including all genera with 12-jointed antennae through *Pristomyrmex* (11 joints) to *Perissomyrmex* (9 joints). If our reconstruction is plausible we should have a clade including *Perissomyrmex* + *Pristomyrmex* and characterized by the toothed clypeus (the morphology known in *Myrmecina* Curtis 1829 that is similar to *Perissomyrmex* should be due to convergence if we respect the hypothesis of character polarization). Within this clade the genus *Pristomyrmex* would be characterized by at least one autapomorphy: loss of the propodeal suture (present in *Perissomyrmex*). *Perissomyrmex*, in this way, would be characterized by the obviously autapomorphic (since it is unique) extreme reduction in number of the antennal joints (9 as opposed to 11), thereby making two distinct genera.

The status of the new Bhutanese specimens as a valid new species is not in doubt given the following significant differences between the two species:

- (i) sculpture of the mandibles, very slightly striate in *P. monticola* as opposed to coarsely striate in *P. snyderi*;
- (ii) sculpture of pleuron 2 and propodeum, smooth in *P. monticola* as opposed to coarsely striate in *P. snyderi*;
- (iii) subpetiolar process, absent in *P. monticola* as opposed to a ventrally prominent lobe in *P. snyderi*.

BIOGEOGRAPHICAL CONSIDERATIONS

The original description of *P. snyderi* was based on two specimens intercepted at a plant quarantine station in New Jersey (USA) and associated with begonia tubers from Guatemala. Since SMITH's (1947) original description, Guatemala has been tacitly accepted as the place of origin of this ant. However, important amounts of new collections from Guatemala and other Central American countries since this date have been regularly unable to confirm the Latin American origin of this genus.

Given the fact that the maximum known diversity of *Pristomyrmex* (the most probable sister genus of *Perissomyrmex*) is confined to the Asian region and no Neotropical representatives of this genus are known, the discovery of the new Bhutanese species adds strong weight to the hypotheses of an Old World natural habitat for *Perissomyrmex* as well and to its accidental introduction in both previously recorded American localities (Guatemala + New Jersey).

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