

A REVISION OF THE SOUTH AMERICAN
SPECIES OF THE ANT GENUS *PROBOLOMYRMEX*
(HYMENOPTERA: FORMICIDAE)

DONAT AGOSTI

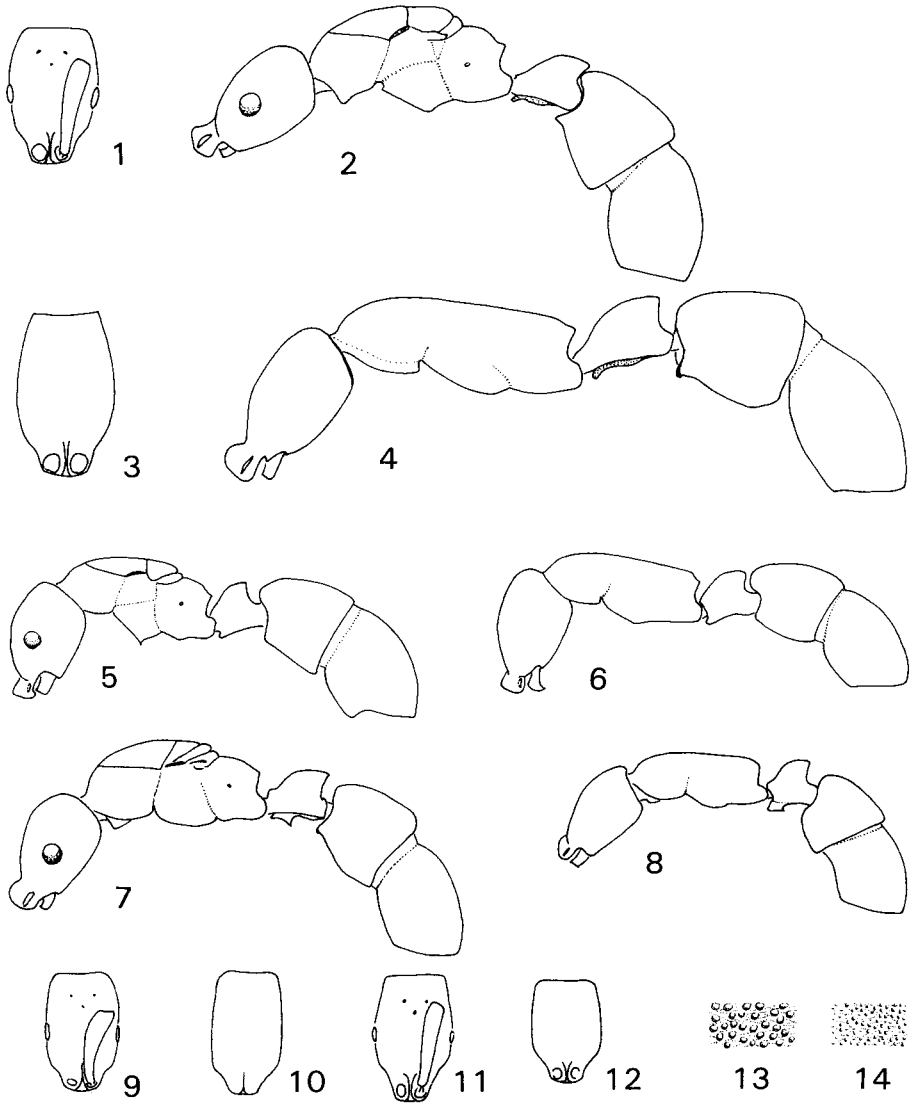
Department of Entomology, American Museum of Natural History,
Central Park West at 79th Street, New York, New York 10024-5192

Abstract.—The South American species of the ant genus *Probolomyrmex* are revised. Three species *boliviensis*, *brujitae*, new species, and *petiolatae* are recognized. The synonymy of *angusticeps* with *boliviensis* is confirmed. A key to the species is given.

Probolomyrmex is a rare ant genus with pantropical distribution, comprising 13 species. So far, only two species were known from South America. The revision of the genus by Taylor in 1965 was based on few South American specimens from only two localities. With the exception of one nest series, all other specimens were taken as single ants in leaf litter samples or from rotten logs. However, it is more than likely that this genus belongs to a group of ants, which are more common than it appears from these collections. Ants living in leaf litter have only recently been given more attention, which led to the conclusion that the leaf litter might be the most diverse stratum for ants (e.g., Agosti et al., 1994; Belshaw and Bolton, 1994). However, there are not yet enough data to understand, whether there is a high faunal diversity between sites and thus a very high number of ant species as could be inferred from the South East Asian *Myrmoteras* (Agosti, 1992) with a very high degree of endemism, or a rather low as shown for West Africa by Belshaw and Bolton (1994). The latter observation is supported by recently collected *Probolomyrmex* specimens, including more localities indicating a much more extended distribution from Panama in the North to Argentina in the South.

Despite its scarcity, the species of this genus are well and comprehensively known through Taylor's revision in 1965 and Brown's additions (Brown, 1975). The sampling of recently collected series with workers and females confirmed the proposed synonymy of *angusticeps* with *boliviensis* (Brown, 1975), as well as the presence of a further species, *brujitae*, described below. *P. brujitae* is the most southern sample so far recorded in South America, and the first for Argentina, despite Kusnezov's thorough study of the Argentinian ant fauna (e.g., Kusnezov, 1978). However, the phylogeny of this genus is not yet understood.

This study aims at revising the South American species of *Probolomyrmex* based on all the available specimens from the following collections: American Museum of Natural History, New York, USA (AMNH); Museum of Comparative Zoology, Harvard University, Cambridge, USA (MCZ); United States National Museum of Natural History, Washington, USA (USNM). The measurements are given in mm and follow those used by Taylor (1965:351): CI cephalic index ($HW \times 100/HL$), HL head length, HW head width, SL scape length, SI scape index ($SL \times 100/HW$), TL mesosoma length; all measurements are given in mm.



Figs. 1-14. 1-4. *Probolomyrmex boliviensis*. 1-2. Female (holotype): 1, head in full frontal view; 2, lateral view. 3-4. Worker (*angusticeps* syn.); 3, head; 4, lateral view. 5-6. *brujitae*, lateral view: 5, female (paratype); 6, worker (holotype). 7-8. *petiolatus*, lateral view: 7, female; 8, worker. 9-10. *brujitae*, head: 9, female (paratype); 10, worker (holotype). 11-12. *petiolatus*, head: 11, female; 12, worker. 13-14. Sculpture of lateral parts of first gastral tergite: 13, *boliviensis*; 14, *brujitae*. All drawings of the same size except 13 and 14, which are 2× larger.



Fig. 15. *Probolomyrmex brujitae*, holotype. The specimen was collected alive from a Winkler bag. The stretched out antennae with hardly any angle between the scape and the funiculus are typical.

Genus *Probolomyrmex* Mayr

Probolomyrmex Mayr, 1901:2. Type species: *Probolomyrmex filiformis* Mayr, by monotypy. Taylor, 1965, revision.

Escherichia Forel, 1910:245. Type species: *Escherichia brevirostris* Forel, by monotypy. Syn. by Taylor, 1965:346.

A detailed and illustrated key to the genus is given by Bolton (1994), and a detailed diagnosis of the genus is provided by Taylor (1965). The long and slender body, the brown coloration, the finely or smoothly sculptured surface, the long sting, and foremost the socket-like base of the antennal insertion, unique among the ants, make this genus easily recognizable. Variation among the species is almost limited to changes in shape of the head and scape, the petiole and to a lesser degree, the body sculpture. In the field, the species are recognized by their very fast, straight movements, the stretched out antennae (Fig. 15), and that they are mainly found as singletons.

KEY TO THE SPECIES (Worker and females)

- 1 Petiole in lateral view with a ventral, rectangular process (Figs. 7, 8) *petiolatus*
- Petiole in lateral view with a ventral process directed towards the mesosoma (Figs. 2, 4–6) 2
- 2 Small body size (TL < 0.95 mm), short scape (SI < 105). Sculpture fine and densely set (Fig. 14). First gastral segment ventrally without a collar. Head with a bulge along the posterior ventral face, which, in lateral view is not darker than the adjacent surface. Ventral process of petiole in lateral view of the same color as the adjacent tergite .. *brujitae*
- Larger body size (TL > 0.95 mm), longer scape (SI > 105). Sculpture with large pits with chagrination in between (Fig. 13). First gastral segment ventro-anterior with a distinct collar which is bent ventrally (Figs. 2, 4). Head with a distinct carina along the posterior ventral face, which is darker than the adjacent surface. Ventral process of petiole in lateral view distinctly more darkly colored than the tergite *boliviensis*

Probolomyrmex boliviensis Mann

boliviensis Mann 1923:16. Holotype female, BOLIVIA, Beni, Rurrenabaque, W. M. Mann. USNM type 25906. Description of larva, pupa and biology: Taylor, 1965: 348–9, 360–1 [checked].

angusticeps M. R. Smith 1949:39. Syntypes 2 workers, Panama, Barro Colorado Island, Zetek #5272. Smithsonian type 58833 [checked]. Synonymy by Brown, 1975:11 [see also note 22 in Brown, 1975:57]. Synonymy confirmed.

FEMALE. HL 0.67–0.70, HW 0.45–0.5, SL 0.47–0.61, TL 0.98–1.06, CI 65–69, SI 105–123, Figures 1–2 (3 examined).

WORKER. HL 0.68–0.82, HW 0.42–0.47, SL 0.50–0.64, TL 0.96–1.25, CI 57–62, SI 119–136, Figures 3–4 (15 examined).

Material examined. 18 workers, 3 females, deposited in MCZ and USNM. PANAMA, Barro Colorado Island, Canal Zone, 21 June 1961, R. W. & W. Taylor; PANAMA,

pipeline road, Gamboa, 1976, Sclavings. COLOMBIA, Magdalena, Tayrona PK, Pueblito, 1 October 1976, Berlese sample, leaf litter, C. Kugler. PERU, Madre de Dios, Cuzco Amazonico, 15 km NE of Puerto Maldonado, 200 m, Terra Firme forest, plot IU15, rotten chunk of wood half buried in soil, 22 June 1989, S. P. Cover & J. Tobin.

Comments. This is the largest of the South American species. It is easily diagnosed by the combination of its mesosoma size, the short scape and the very distinct sculpture. The synonymy could be confirmed through a series of workers and females. The biology of *boliviensis* is described in detail by Taylor (1965), but many questions such as nutritional base need to be answered. This species occurs in rainforests of northern South America, from Panama to Bolivia.

Probolomyrmex brujitae, new species

Holotype 1 worker, Argentina, Jujuy, Aguas Blancas-Yaculica (Argentinian-Bolivian Frontier), 22°43'44"S 64°22'25"W, 460 m, 25 October 1994, D. Agosti & J. M. Carpenter, Winkler sample, leaf litter, Yungas forest. Holotype deposited in MCZ.

Paratype 1 female, same Winkler sample as holotype. Deposited at Instituto Miguel Lillo Tucumán.

FEMALE. HL 0.57, HW 0.35, SL 0.35, TL 0.85, CI 62, SI 100, Figures 5, 9 (1 examined).

WORKER. HL 0.60, HW 0.36, SL 0.35, TL 0.81, CI 60, SI 99, Figures 6, 10, 14, 15 (1 examined).

Material examined. Holotype and paratype.

Comments. This species is easily recognized by its small size, the fine sculpture, and the shape and color of the ventral petiolar process which is the same as the one of the petiolar tergite. The specimens were collected by Winkler bags using sifted leaf litter from a secondary Yungas forest, and this species is only known by the two type specimens collected in the same locality.

Probolomyrmex petiolatus Weber

petiolatus Weber, 1940:76. Holotype worker, Panama, Barro Colorado Island [specimen from BCI compared with the type checked by S. Cover].

FEMALE. HL 0.61, HW 0.42, SL 0.44, TL 0.90. CI 70, SI 104, Figures 7, 11 (1 examined).

WORKER. HL 0.51–0.64, HW 0.35–0.40, SL 0.31–0.41, TL 0.66–0.88, CI 63–69, SI 70, Figures 8, 12 (2 examined).

Comments. This species is easily recognized by the subpetiolar process. The new samples expand the known distribution range well into northern South America. Nothing is known of the biology of this species.

Material examined. 2 workers and 1 female, deposited in MCZ and USNM. PANAMA, Barro Colorado Island; leaf litter, forest floor; A. Newton. COLOMBIA, Meta, Quebrada Susamuko, 23 km NW Villavicencio, 1,000 m, leaf litter, March 5, 1972, J. Peck. VENEZUELA, T. F. Amazonia, Cerro de la Neblina, basecamp, 140 m, 0°50'N 66°10'W, 10–20 February 1985, flight intercept pan trap in rainforest, P. J. Spangler et al.

ACKNOWLEDGMENTS

This study was supported by Kalbfleisch fellowship at the American Museum of Natural History, and by a faunal survey grant from NSF (BSR-9024566 to N. I. Platnick and R. T. Schuh). The National Parks Commission in Argentina was very helpful in organizing the fieldwork, and the very informed contributions of Abraham Willink (Instituto Miguel Lillo, Tucumán) and Manfredo Fritz (CONICET) were very fruitful. Stefan Cover (MCZ) and David R. Smith (USNM) generously provided me with the types and specimen of their collections. Roberto C. Brandão supplied me with data on the Brazilian species. Last but not least, Jim Carpenter initiated this study by organizing the field trip and helped to finish it through his editorial assistance.

LITERATURE CITED

- Agosti, D. 1992. Revision of the ant genus *Myrmoteras* of the Malay Archipelago (Hymenoptera, Formicidae). *Rev. Suisse Zool.* 99:405–429.
- Agosti, D., Maryati Mohamed and C. Y. C. Arthur. 1994. Has the diversity of tropical ant fauna been underestimated? An indication from leaf litter studies in a West Malaysian lowland rainforest. *Trop. Biodiv.* 2(1):270–275.
- Belshaw, R. and B. Bolton. 1994. A survey of the leaf litter ant fauna in Ghana, West Africa (Hymenoptera: Formicidae). *J. Hym. Res.* 3:5–16.
- Bolton, B. 1994. Identification Guide to the Ants of the World. Harvard University Press, Cambridge.
- Brown, W. L., Jr. 1975. Contributions toward a reclassification of the Formicidae. V. Ponerinae, Tribes Platythyreini, Cerapachyini, Cylindromyrmecini, Acanthostichini and Aenictogitini. *Search Agric. Ent.* 15:1–115.
- Forel, A. 1910. Ameisen aus der Kolonie Erytraa, gesammelt von Prof. K. Escherich (nebst einigen in West-Abyssinien von Herrn A. Ilg gesammelten Ameisen). *Zool. Jahrb., Syst.* 29:243–274.
- Kusnezov, N. 1978. Hormigas argentinas, clave para su identificación. *Minis. Cul. Edu., Fund. Miguel Lillo, Misc.* 61:1–147.
- Mann, W. M. 1923. Two new ants from Bolivia. *Psyche* 30:13–18.
- Mayr, G. 1901. Sudafrikanische Formiciden, gesammelt von Dr. Hans Brauns. *Ann. K. Naturh. Hofmus., Wien* 16:1–30.
- Smith, M. R. 1949. A new species of *Probolomyrmex* from Barro Colorado Island, Canal Zone. *Proc. Ent. Soc. Wash.* 51:38–40.
- Taylor, R. 1965. A monographic revision of the rare tropicopolitan ant genus *Probolomyrmex* Mayr (Hymenoptera: Formicidae). *Trans. R. Ent. Soc. Lond.* 117:345–365.
- Weber, N. A. 1940. Rare ponerine genera in Panama and British Guiana. *Psyche* 47:75–84.

Received 6 January 1995; accepted 10 January 1995.

