

ANTS OF THE DOMINICAN AMBER (HYMENOPTERA: FORMICIDAE)  
4. A GIANT PONERINE IN THE GENUS *PARAPONERA*

EDWARD O. WILSON

*Museum of Comparative Zoology, Harvard University,  
Cambridge, Massachusetts 02138, U.S.A.*

ABSTRACT

The first fossil of the ponerine ant genus *Paraponera* is described from the amber of the Dominican Republic, a deposit regarded to be no younger than early Miocene in age. The specimen is also the largest ant fossil of any kind discovered to date. *Paraponera* is today represented by a single species, *P. clavata*, which ranges through most of Central and South America but is wholly absent from the Dominican Republic and the remainder of the Greater Antilles. **KEY WORDS:** Fossil ants, Ponerinae, Dominican amber.

INTRODUCTION

Among the rich ant remains that have recently come to light in the amber of the Dominican Republic (Baroni Urbani, 1980; Baroni Urbani and Saunders, 1982; Wilson, 1985a-d) is a single worker of the ant genus *Paraponera*. The specimen, transmitted to me by Robert E. Woodruff and since deposited in the Museum of Comparative Zoology, is recorded as "probably" from the Palo Alto mine, located in the mountainous La Cumbre region just northeast of Santiago. The age of the Dominican amber is considered to be no younger than early Miocene (Baroni Urbani and Saunders, 1982). Of the 37 ant genera found so far in the amber, 22 persist today on Hispaniola (Dominican Republic plus Haiti). Three genera (*Ilemomyrmex*, *Oxydris*, and a new genus near *Rogeria*) became extinct everywhere, and 12 have disappeared from Hispaniola but still live elsewhere in the New World tropics. Twelve other native genera and well-marked subgenera have invaded Hispaniola since amber times, while 3 more have been introduced in recent years through human commerce, restoring the total number of contemporary genera and subgenera to 37 (Wilson, 1985d). Thus the generic turnover since amber times has been approximately one-third.

This article is dedicated to my friend and colleague Jehoshua Kugler on the occasion of his seventieth birthday.

DESCRIPTION OF THE FOSSIL

*Paraponera* belongs to the large and diverse ponerine tribe Ectatommini (Brown, 1958). It is distinguished from *Ectatomma*, which it most closely resembles, and other related ectatommine genera by the following traits:

- (1) The size is exceptionally large; the total length is 20-25 mm.
- (2) A shallow scrobe, large enough to accommodate both the scape and funiculus, extends all the way around the eye.
- (3) The petiolar node is rectangular in side view, with the anterior and dorsal faces meeting at a right angle; also, the anterior petiolar peduncle bears a sharp, downward-directed spine on its venter (Fig. 1A).
- (4) The tarsal claws each bear a secondary, inner tooth which is almost as long as the primary, outer tooth (Fig. 1B). Some species of *Ectatomma* also possess such a secondary tooth, but it is much less developed.
- (5) Each of the lateral borders of the hypopygidium is lined with an upward-turning comb of sharp, slender spinules (Fig. 1C).

The Dominican amber fossil has all of the above generic traits (see for example Fig. 1D,E), with the sole exception that it appears to lack the ventral spine of the petiolar peduncle. This last variance is of questionable significance, however, because the specimen is badly shriveled and a number of other traits have obviously been partly or wholly obliterated as a result (for example, the sting is broken off and the right compound eye is missing). For the same reason it is not possible to make a sufficiently detailed comparison with *P. clavata* to determine whether the amber form is a distinct species or not. It may be significant that the fossil worker is at the lowermost end of the size variation of the large collection of *P. clavata* I have examined from South and Central America. Its head length, measured from the side and excluding the mandibles, is 4.4 mm, its scape length 3.6 mm, and its thorax length 5.4 mm. *P. clavata* workers show the following variation: head length 4.2-7.0 mm. Additional material, if it can be obtained, may reveal that the amber population was a smallish species different from the modern *clavata*. If so, it would conform in its specific rank to all of the other amber populations so far studied in sufficient detail to ascertain their status.

#### DISCUSSION

The Dominican amber *Paraponera* is important for several reasons. It is the first fossil recorded of the genus, and it is — I believe — the largest ant ever found in the fossil state. The closest rivals for the latter distinction are *Prionomyrmex longiceps* of the Baltic amber (Wheeler, 1914) and *Archiponera wheeleri* of the Miocene Florissant shales (Carpenter, 1930), which have a total length of 15 mm or less, as opposed to 20 mm in the *Paraponera*. The giant *Eoponera berryi* of the Eocene of Tennessee, another potential rival, has been removed from the ants and placed in the Myrmeciidae by Rasnitsyn (1980), which is listed as a synonym of the Pseudosiricidae by Smith (1978).

The discovery of the fossil also has biogeographic importance. *Paraponera* is today represented solely by *P. clavata*, which ranges in often dense populations over the mainland from Nicaragua to Paraguay and Bolivia but occurs nowhere in the Greater Antilles. It is a typical forest ant, whose workers forage from ground and tree-trunk nests out over the ground and up into the bushes and trees. The occurrence of *Paraponera* on Hispaniola during amber times, along with at least two other genera of large, arbicolous ants (*Dolichoderus*, *Monacis*) that later retreated from the

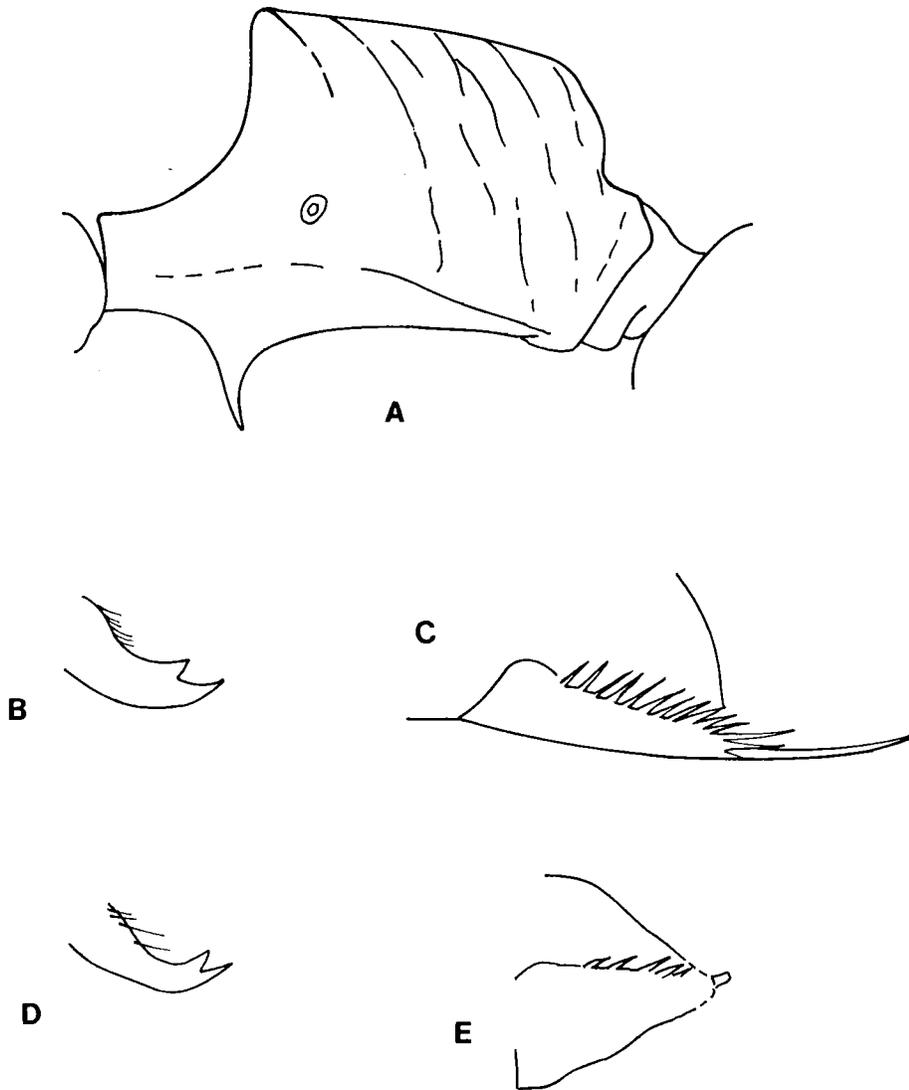


Fig. 1. Recent and fossil *Paraponera* ant workers. *P. clavata*, the living species, anatomical features of a worker from Isla Paloma, Orinoco Delta, Venezuela: A, left side of petiole; B, claw of fore tarsus; C, left side of terminal segment of gaster, showing sting and comb of spinules fringing the hypopygidial border. *Paraponera* sp. from the Dominican amber: D, claw of fore tarsus; E, left side of terminal segment of gaster.

greater Antilles (Wilson, 1985c), suggests that moister tropical forests may have covered part of the island during the Tertiary Period.

#### ACKNOWLEDGMENTS

The research on Dominican amber ants has been supported by grant no. BSR 81-19350 from the U.S. National Science Foundation.

## REFERENCES

- Baroni Urbani, C. 1980. The ant genus *Gnamptogenys* in Dominican amber (Amber Collection Stuttgart: Hymenoptera, Formicidae. IV. Ectatommini). *Stuttgarter Beiträge zur Naturkunde, Serie B (Geologie und Paläontologie)*, 67:1-10.
- Baroni Urbani, C. and Saunders, J.B. 1982. The fauna of the Dominican Republic amber: The present status of knowledge. *Transactions of the Ninth Caribbean Geological Conference, Santo Domingo, Dominican Republic, 1980 (1982)*, 1:213-233.
- Brown, W.L. 1958. Contributions toward a reclassification of the Formicidae. II. Tribe Ectatommini (Hymenoptera). *Bulletin of the Museum of Comparative Zoology Harvard*, 118:175-362.
- Carpenter, F.M. 1930. The fossil ants of North America. *Bulletin of the Museum of Comparative Zoology Harvard*, 70:1-66, 11 pls.
- Rasnitsyn, A.P. 1980. Origin and evolution of the Hymenoptera. *Trudy Paleontologicheskogo Instituta. Akademiya nauk SSSR*, 174:1-190. (In Russian.)
- Smith, D.R. 1978. *Hymenopterorum Catalogus*, Pt. 14, p. 35. W.E. Junk, The Hague.
- Wheeler, W.M. 1914. The ants of the Baltic amber. *Schriften der Physikalisch-ökonomischen Gesellschaft zu Königsberg*, 55:1-141.
- Wilson, E.O. 1985a. Ants of the Dominican amber (Hymenoptera: Formicidae). 1. Two new myrmicine genera and an aberrant *Pheidole*. *Psyche*, 92:1-9.
- Wilson, E.O. 1985b. Ants of the Dominican amber (Hymenoptera: Formicidae). 2. The first fossil army ants. *Psyche*, 92:11-16.
- Wilson, E.O. 1985c. Ants of the Dominican amber (Hymenoptera: Formicidae). 3. The subfamily Dolichoderinae. *Psyche*, 92:17-37.
- Wilson, E.O. 1985d. Invasion and extinction in the West Indian ant fauna. *Science*, 229:265-267.