

Abstract*

Ecology of New Guinea ants (Hymenoptera: Formicidae) – exploring an unknown fauna

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The ant diversity in New Guinea lowland forests is considered to be among the highest in the world (WILSON 1959, SNELLING 1998). At the same time, the local ant fauna is extremely poorly known. Over 730 ant species have been reported from the whole island, representing an interesting combination of Australian and SE Asian taxa (JANDA & ALPERT 2007). However, many local species remain undescribed. During the past few years, we have explored several rainforest localities across the northern part of Papua New Guinea. Our main objectives were to characterize the ant species richness and diversity turnover in lowland rainforests, to investigate the structure of ant assemblages living in lower forest strata, and to assess the impact of environmental disturbance. Ants were collected in plots (20 × 20 m) within primary and secondary rainforests, using a consistent combination of sampling methods (bait traps, leaf litter samples and hand collecting). So far, we have accumulated over 10,000 individual ant samples from more than 80 plots. Processing and analysis of the material is currently in progress. It includes DNA sequencing of species from several taxonomically problematic genera and construction of a public on-line database containing photographs and data on species distribution, habitat, nesting preferences and other information.

Preliminary analyses of data from six primary forest plots near Madang (NE coast of New Guinea) confirmed the expected high species richness. The plots were scattered across an area of approximately 20 km², with a distance of at least 400 m between individual plots. We found 215 ant species in 606 samples acquired by all collecting methods combined (Fig. 1). On average, 80 ant species per plot were found (SD = 25.3) with one plot occupied by as many as 125 ant species. The five most species rich genera were *Pheidole* (36 spp.), *Strumigenys* (18 spp.), *Tetramorium* (12 spp.), *Hypoponera* (11 spp.) and *Carebara* (9 spp.). The most frequently encountered species were *Crematogaster* cf. *polita* SMITH, 1865, *Rhytidoponera aenescens* EMERY, 1900, *Camponotus vitreus* (SMITH, 1860) and *Oecophylla smaragdina* (FABRICIUS, 1775), all of which were active on the ground or lower vegetation strata. Not surprisingly, among the methods applied Winkler's leaf litter samples yielded the highest number of species (131). Hand collecting and bait trapping yielded 92 and 70 species, respectively. Leaf litter samples provided the highest number of species collected exclusively by a single trapping technique (92), where-

as 40 species were obtained solely from hand collecting, and 20 species solely by bait traps. Only 17 species were collected by all three methods.

Data and photographs of a majority of the collected species and of other Melanesian ants will be available by the end of 2007 in the form of a database at the website of the Institute of Entomology, Biology Centre, ASCR, at:

<http://www.entu.cas.cz/png/>

References

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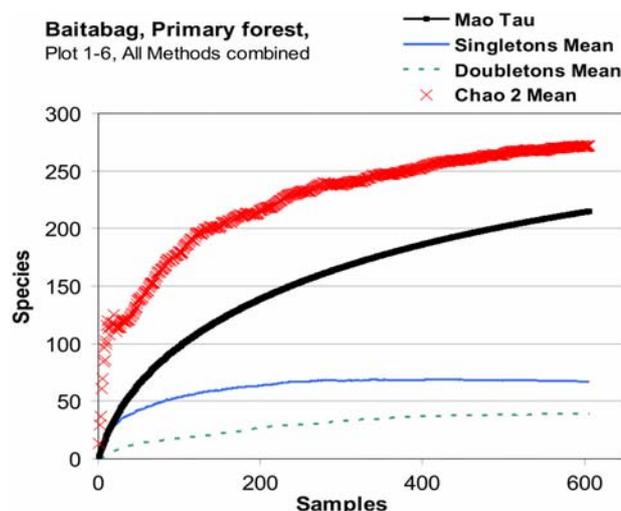


Fig. 1: Species accumulation curve (Mao Tau function implemented in EstimateS software) and Chao 2 total species richness estimator for all sampling methods combined. In total, 215 species were found in six plots (20 × 20 m) located in a primary forest in the Baitabag locality (25 km N of Madang, Papua New Guinea).

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