

## STRUCTURE OF AN ANT ASSEMBLAGE IN THE CANOPY OF A TROPICAL RAINFOREST IN PAPUA NEW GUINEA.

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The structure of a canopy ant assemblage living on *Pometia pinnata* (Sapindaceae) and *Dracontomelum dao* (Anacardiaceae) trees was investigated in a 1-km<sup>2</sup> area of tropical rainforest in Papua New Guinea. The canopy was treated by insecticidal fogging and the falling arthropods were collected in 20 funnels of 1 m<sup>2</sup> hung under each tree. Eleven trees of *Pometia pinnata* and ten trees of *Dracontomelum dao* were fogged in April-June 1993 and 1994. In addition, three specimens of each tree species were re-fogged after a year interval to evaluate the recovery process.

A total sample of approximately 114,000 individual ants was obtained. Formicidae represented 78% of all arthropods collected. The rest consisted mostly of : Coleoptera (Chrysomelidae, Curculionidae, Corylophidae, ...) (9%), Thysanoptera (2%), Arachnida (2%), Diptera (1%), Hymenoptera other than formicids (1%), Homoptera (1%, Coccoidea not collected), lepidopteran larvae (1%), Orthoptera (1%), Heteroptera (1%), ... Globally, no correlation could be found between the abundance of ants and the abundance of other arthropods collected.

The samples were characterized by an overwhelming abundance of *Crematogaster major* Donisthorpe (approx. 76,000 individuals). In term of numbers, this ant was dominant on 5 *D. dao* and 7 *P. pinnata* (56 – 99% of all ants collected from the trees). On other trees, the most abundant ant was : *Technomyrmex* sp.1 (77 – 91%, on 3 *P. pinnata*), *Oecophylla smaragdina* (F.) (48 - 81%, on 1 *P. pinnata* and 2 *D. dao*), *Crematogaster* sp.1 (28 – 56 %, on 2 *D. dao*). There was a clear exclusion between *Crematogaster major* on the one hand, and *O. smaragdina* , *Technomyrmex* sp.1, *Crematogaster* sp.1 on the other hand. The latter three species were found coexisting on 3 *P. pinnata* and 2 *D. dao* or associated in pairs on 2 other trees. A few other ant species, though collected in low abundance, were positively associated with these co-dominants. *Anoplolepis gracilipes* (Smith) and *Anonychomyrma* sp.1 were apparently well tolerated by all four most abundant species. Ant species were distributed independently from the tree species.

After a year interval, the number of ant collected from 5 out of 6 replicates was similar to the value obtained with the first fogging. Almost no change was observed in trees (n = 3) dominated by *C. major* and in one tree where *O. smaragdina*, *Technomyrmex* sp.1 and *Crematogaster* sp.1 were co-dominant. In two other replicates, one of the latter species became much better represented.

This study suggest that the canopy of the tropical rainforest studied is partitioned into mutually exclusive territories of codominant ants and corresponds to an ant mosaic. A first attempt to identify the species found in the samples suggest that the arboreal ant diversity is lower when *C. major* is dominant. These results will be further discussed in the light of the analysis of the ant fauna of 16 canopies from various tree species.

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