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Arboreal ant mosaics meltdown along an elevation gradient in Papua New Guinea

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Mosaics of ant territories resulting from the mutual exclusion of dominant arboreal ants from tree crowns are common in tree plantations and in lowland tropical forests. In temperate zones arboreal-nesting ants, especially territorial ones, are much less abundant probably because of unfavourable climatic conditions. Therefore along a tropical mountain one can expect the decay of ant mosaics with increasing elevation.

We mapped the distribution of numerically dominant ant colonies, often spreading on several neighbour trees, in ¼ ha plots distributed between 200 and 2700m asl along Mt Wilhelm, Papua New Guinea. Ants were captured at tuna/honey baits spread along tree trunks from the ground to the top of canopy trees.

In lowland forests (200-700m) *Crematogaster polita* large carton nests were omnipresent and often formed supercolonies. Other major players were *Oecophylla smaragdina* nesting in leaves and *Anonychomyrma* cf *scrutator* nesting in live plant tissues. At mid-elevation (1200-1700m) dominant ants were *Anonychomyrma* spp. and two species found in myrmecophytes (*Monomorium sp. nov. aff. edentatum* and *Philidris* cf. *cordata*). At 2200m ants found in the canopy (e.g. *Ancyridris*, *Pheidole*) were probably living in suspended soil. No ants were observed at 2700m.

In conclusion, with increasing elevation it seems that there is a progressive filtering of the most abundant arboreal ant species. Typical territorial ants, living in carton or leaf nests are eliminated first. At mid-elevation myrmecophytes allow to maintain high ant populations in trees. At high elevation only species nesting in suspended organic matter remain

From individual diet determination to food web disentanglement: the use of stable isotopes and fatty acids in the study of ant trophic ecology

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Ants feed on a broad range of food sources and play a variety of trophic functions in tropical forests where their biomass and diversity are high. Due to the difficulty of assessing ant diet by direct observations in the field, biochemical methods such as stable isotope (SI) and fatty acid (FA) analyses appear as a solution to investigate their trophic ecology. SI and FA analyses have only rarely been used in tropical terrestrial environments. We illustrate the use of these techniques at two different levels of resolution: 1/ at the level of a species, with the determination of the trophic position of a rare and cryptic neotropical ant species, *Tatuidris tatusia*, and 2/ at the level of an elevation gradient in Papua New Guinea, by testing whether ants species with a large distribution occupy the same trophic level at each elevation, and whether their food is based on the same primary sources. While feeding experiments on live *T. tatusia* and direct observation in the field did not provide any information on their food preference, the N isotope analysis of its tissues and of a series of other arthropods present in the leaf-litter suggested that *T. tatusia* are top predators in the leaf-litter food web. The study in Papua New Guinea is still ongoing. However, based on preliminary results and on a short review of the state of the art, we will show how SI and FA analyses are complementary to investigate changes in trophic interactions in food webs along elevation gradients.