

An analysis of declining ant species richness with increasing elevation at Mount Kinabalu, Sabah, Borneo

Abstract

This study investigated factors responsible for the decline of ant species richness with increasing elevation in an evergreen tropical rain forest on Mount Kinabalu. From 580 m to 1520 m a.s.l. we studied the ant community as well as biotic and abiotic factors in parallel on the ground and in the lower vegetation with various methods. We collected a total of 376 ant morphospecies, belonging to 65 genera and 8 subfamilies. The decline of ant species richness was significantly correlated with the decline in temperature but the pattern of decline differed between the two strata. In contrast the ant nest density remained the same on the ground and in the lower vegetation up to 1000 m, but then dropped significantly. As the main nesting resource (dead wood) remained rather constant over the elevation gradient, the most plausible explanation is a direct impact of temperature. In addition, the increasing compaction of the soil and increased depth of the humus layer also restricts nesting on the ground at the highest elevations. A case study of the ground ant *Diacamma* sp. along the elevation gradient indicated scarcity of food as another important factor in the ground layer uphill.