

Leaf Litter Ant Diversity and Composition: Ecological Trends

Thus far we have considered differences in ant diversity and faunal composition without reference to the ecological roles of the constituent taxa. In fact, for leaf litter ants, which are mostly small in size and cryptic in habits, this is largely terra incognita. There does appear to be substantial variation in functional roles, from host-specific predators (e.g., Cerapachyinae, some Ponerinae, and myrmicine tribes such as Basicerotini, Dacetoniini, and Myrmeciniini) to generalist predators (many Ponerinae), seed harvesters (some *Pheidole* and *Acanthomyrmex*), and omnivores or scavengers (many myrmicines and formicines). For many regionally prominent leaf litter ants (e.g., species of *Brachymyrmex*, *Rogeria*, *Stenammina*, *Tetramorium*, *Vollenhovia*) and even members of such cosmopolitan genera as *Oligomyrmex* and *Pheidole*, we know little about their feeding habits and ecological effects. It may be possible to assign a functional group label of "cryptic species" or "tropical climate specialist" to such leaf litter ants (cf. Andersen 1995), but this reveals little about their biology.

Some ecological variation in leaf litter ant communities appears to have a strong geographical component. For example, the relative prevalence of species of Ponerinae, a group of mostly predacious ants, is strongly negatively correlated with latitude ($r = -0.698$, $P = 0.000$; proportions arcsine-transformed) (Fig. 8.4). Ponerine species are also overrepresented in leaf litter samples from the Indo-Australian region compared to other tropical continents, as noted previously. Other ecologically well-defined ant taxa (e.g., leaf litter species of the fungus-growing tribe Attini; army ants of the subfamily Ecitoninae; mite-catching *Myrmecina*; some of the collembolan-hunting dacetine genera) also have geographically restricted distributions. All of this hints at complex geo-

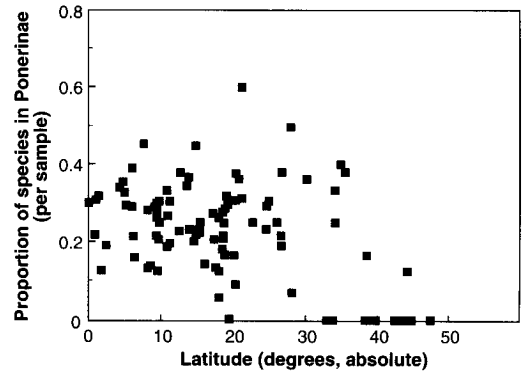


Figure 8.4. Proportion of ant species in a sample belonging to the subfamily Ponerinae as a function of latitude.

graphical variation in leaf litter community structure that we have hardly begun to investigate.

Latitudinal gradients have been reported in ant worker body size (Cushman et al. 1993) and in ant colony size (Kaspari and Vargo 1995). These studies were not specifically concerned with the leaf litter habitat, but many of the ant species from which data were taken, especially in the colony size study, are leaf litter inhabitants. In both studies the authors favored the hypothesis that abiotic factors select for larger body or colony sizes at higher latitudes, as a buffer against starvation. It would be interesting to have comparable data for elevation gradients.

Caveats and Concluding Remarks

This study is an attempt to characterize large-scale geographical variation in ant leaf litter communities. The analysis is based primarily on a series of Winkler litter samples, and the results should be considered provisional. The samples cover a broad but by no means comprehensive set of geographical locations. All samples in this study come from moist leaf litter in woodland and forest habitats. Xeric environments, to which the Winkler method is poorly suited, have been largely ignored (only 6 of the