

Figure 8.2. Species richness of ant leaf litter samples as a function of latitude. Values are plotted separately for low-elevation and high-elevation sites. Total number of sites: 110.

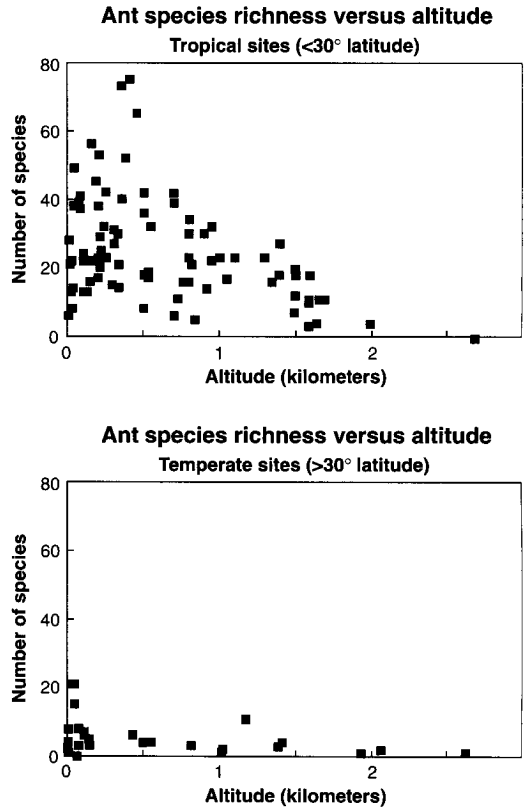


Figure 8.3. Species richness of ant leaf litter samples as a function of altitude. Values are plotted separately for tropical (<30° latitude) and temperate sites.

(1971) and Olson (1994) have discussed the possible consequences of this decline in ant diversity for other ground-dwelling arthropods. In Olson's (1994) study of leaf litter invertebrates in Panama, carabid beetles and weevils showed peaks of abundance and diversity at the highest elevations, where ants were relatively scarce, suggesting ecological release or replacement.

A midelevation peak in species richness of leaf litter ants was documented by Olson (1994) for Panama and by Fisher (1998) for Madagascar. Sampson et al. (1997) described a similar pattern for ground-dwelling and arboreal ants in the Philippines. The present results

extend the generality of these findings. Midelevation diversity peaks have also been reported for other taxa and on larger spatial scales (e.g., McCoy 1990; Colwell and Hurtt 1994; Rahbek 1995, 1997; cf. Stevens 1992). Various nonexclusive hypotheses have been put forward to explain this phenomenon, including the coincidence of midelevation sites with regions of either intermediate (Rosenzweig 1995) or maximum (Janzen et al. 1976) productivity, coupled with the respective assumptions that species richness bears a unimodal or monotonic relationship to productivity. It has also been argued that topographical constraints such as bounded ranges (Colwell and Hurtt 1994) and narrower