

Table 3.2 Generalized Myrmicines as Subdominant Ants to Dominant Dolichoderines^a

Characteristic	Dominant Dolichoderinae	Generalized Myrmicinae
Primary distribution	Low stress	Moderate stress
Territory size	Large	Restricted
Rates of foraging activity	Very high	Moderate
Resource monopoly	Aggressive displacement	Occupation and defense

^aSee text for details.

Generalized myrmicines, and rates of activity are more moderate.

3. Dominant dolichoderines actively displace other ants from food sources, whereas Generalized myrmicines often rely more on stout defense of food sources they have initially occupied (Andersen et al. 1991).

In cooler parts of the world, Dominant dolichoderines are mostly absent, and the abundance of Generalized myrmicines is greatly reduced. Throughout the Palearctic and Nearctic, the behaviorally dominant ants of cool-temperate regions are mound-building formicines (Cold climate specialists)—species of *Formica* and to a lesser extent *Lasius* (Creighton 1950; Rosengren and Pamilo 1983; Savolainen and Vepsäläinen 1988). It seems likely that their behavioral dominance in such cool climates is related to the thermoregulatory properties of their nests (Hölldobler and Wilson 1990). For example, with air temperature less than 14°C, *Formica polyctena* can achieve nest temperatures of up to 25°C (Coenen-Stass et al. 1980).

The relative importance of behavioral dominance varies markedly within the rainforest in response to increasing stress. Most behaviorally dominant taxa that occur in the tropics are arboreal, a habitat in which they can exploit direct sunlight. Such taxa include Dominant dolichoderines (e.g., *Azteca*, *Dolichoderus*, *Philidris*; Greenslade 1971; Adis et al. 1984; Tobin 1991;

Shattuck 1992b), Generalized myrmicines (e.g., *Crematogaster*; Greenslade 1971; Majer 1976; Adis et al. 1984), Tropical climate specialists (e.g., *Myrmicaria*, *Oecophylla*; Greenslade 1971; Majer 1976; Stork 1991), and Subordinate camponotines (e.g., *Camponotus*; Wilson 1987). The canopy is the most productive microhabitat for both ants and plants in tropical rainforest, and there is increasing evidence that behaviorally dominant ants are predominantly primary consumers, being sustained by plant and homopteran exudates (Tobin 1994; Davidson and Patrell-Kim 1996).

The abundance of behaviorally dominant ants in rainforest decreases with increasing latitude and altitude, with Dominant dolichoderines virtually being restricted to the lowland tropics. On the rainforest floor, the heavy shade and litter represent considerable stresses for ants, and, as discussed by Kaspari (Chapter 2), behavioral dominance is relatively poorly developed, even in the lowland tropics.

Functional Group Composition

Consistent patterns of functional group composition can be recognized in relation to climate and vegetation (i.e., environmental stress). Functional group composition varies between climatic zones and, within any particular zone, varies systematically with vegetation type (Andersen 1995, 1997a). For example, in monsoonal northwestern Australia (Fig. 3.4a–c) the