



Figure 3.2. Functional group model of ant community organization in relation to environmental stress (factors limiting productivity) and disturbance (factors removing biomass). Arrows indicate direction and strength of influence. See text for details.

(tropical climate specialists), or cool-temperate regions (cold climate specialists). Both cold and tropical climate specialists are characteristic of habitats where the abundance of dominant dolichoderines is low, and, aside from their habitat tolerances, they are often unspecialized ants (army and fungus-growing ants are obvious exceptions). Hot climate specialists, on the other hand, are characteristic of sites where dominant dolichoderines are most abundant, and they possess a range of physiological, morphological, and behavioral specializations relating to their foraging ecology, which reduce their interaction with other ants. They include thermophilic taxa (such as species of *Cataglyphis*, *Melophorus*, *Myrmecocystus*, and *Ocymyrmex*; Snelling 1976; Marsh 1985; Christian and Morton 1992; Wehner et al. 1992) and specialist seed harvesters (including species of *Messor*, *Monomorium*, and *Pogonomyrmex*; Morton and Davidson 1988;

Andersen 1991b; Medel and Vásquez 1994), which feature in virtually all of the world's desert ant communities. Although species of *Forelius* have been described as dominant dolichoderines (Andersen 1997a), they might also be regarded as hot climate specialists (Bestelmeyer 1997).

4. *Cryptic species*. These are small to minute species, predominantly myrmecines and ponerines, that nest and forage primarily within soil, litter, and rotting logs. They are most diverse and abundant in forested habitats and are a major component of leaf litter ants in rainforest.
5. *Opportunists*. These are unspecialized, poorly competitive, ruderal species (Grime 1979), whose distributions appear to be strongly influenced by competition from other ants. They often have very wide habitat distributions, but predominate only at sites where stress or disturbance severely limit ant productivity and diversity, and therefore where behavioral dominance is low.
6. *Generalized Myrmecinae*. Species of *Crematogaster*, *Monomorium*, and *Pheidole* are ubiquitous members of ant communities throughout the warmer regions of the world, and they are often among the most abundant ants. As will be discussed later in this chapter, there is often competitive tension between them and dominant dolichoderines, including in tropical rainforest.
7. *Specialist predators*. This group comprises medium-sized to large species that are specialist predators of other arthropods. They include solitary foragers, such as species of *Pachycondyla*, as well as group raiders, such as species of *Leptogenys*. Except for direct predation, they tend to have little interaction with other ants owing to their specialized diets and typically low population densities.