

Global Ecology of Rainforest Ants

Functional Groups in Relation to Environmental Stress and Disturbance

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This chapter deals with global ecology—the analysis and synthesis of ecological patterns and processes on a global scale (Cowling and Midgely 1996), referred to by Brown (1995) as *macroecology*. Global ecology does not address details of community composition and dynamics in any particular place, but instead provides a broad framework for doing so.

Study of the global ecology of rainforest ants seeks to understand how the structure and function of ant communities vary between rainforest and other biomes, among different rainforest types, among different strata within rainforest, and in response to disturbance. This approach requires a predictive understanding of the responses of rainforest ants to environmental stress and disturbance, where stress is defined, following Grime (1979), as any factor limiting

productivity, and disturbance as any factor removing biomass. A key to such an understanding is the identification of functional groups that transcend taxonomic and biogeographic boundaries and respond predictably to stress and disturbance (Lavorel et al. 1997; Smith et al. 1997).

Principles of Stress and Disturbance

The primary stressors for ants are the following:

1. *Low temperature*. I consider low temperature to be the primary stress controlling global patterns of ant productivity and community structure (Andersen 1995). From an ant's perspective, temperature is a product