Abstract

Many models have been proposed to explain the possible role of pests in the coexistence of a high diversity of plant species in tropical forests. Prominent among them is the Janzen-Connell model. This model suggests that specialized herbivores and pathogens limit tree recruitment as a function of their density or proximity to conspecifics. A large number of studies have tested the predictions of this model with respect to patterns of recruitment and mortality at different life stages, yet only a few have directly linked those density or distance-dependent effects to pest attack. If pest-attack is an important factor in density or distance-dependent mortality, there should be spatial heterogeneity in pest pressure. I studied the spatial distribution of leaf damage in saplings of six common Inga species (Fabaceae: Mimosoideae) in the 50ha forest dynamic plot of Barro Colorado Island, Panama. The percent leaf damage of Inga saplings was not heterogeneous in space, and the density of conspecific, congener or confamilial neighbors was uncorrelated with the observed damage levels in focal plants. One of the focal species did suffer density-dependent mortality, suggesting that spatial variation in plant performance in these species is not directly driven by leaf damaging agents. While multiple studies suggest that density-dependent effects on performance are common in tropical plant communities, our understanding of the mechanisms that drive those effects is still incomplete and the underlying assumption that these patterns result from differential herbivore attack deserves more scrutiny. Rev. Biol. Trop. 60 (4): 1503-1512. Epub 2012 December 01.

Keywords

Density-dependence, herbivory, Inga, Janzen-Connell hypothesis, Panama.