

Experimentally testing and assessing the predictive power of species assembly rules for tropical canopy ants

Abstract

Understanding how species assemble into communities is a key goal in ecology. However, assembly rules are rarely tested experimentally, and their ability to shape real communities is poorly known. We surveyed a diverse community of epiphyte-dwelling ants and found that similar-sized species co-occurred less often than expected. Laboratory experiments demonstrated that invasion was discouraged by the presence of similarly sized resident species. The size difference for which invasion was less likely was the same as that for which wild species exhibited reduced co-occurrence. Finally we explored whether our experimentally derived assembly rules could simulate realistic communities. Communities simulated using size-based species assembly exhibited diversities closer to wild communities than those simulated using size-independent assembly, with results being sensitive to the combination of rules employed. Hence, species segregation in the wild can be driven by competitive species assembly, and this process is sufficient to generate observed species abundance distributions for tropical epiphyte-dwelling ants.