

From 'the rich get richer' to biotic resistance: variable relationships between diversity and invisibility

J.A. EVANS¹, D.A. LANDIS¹, D. W. SCHEMSKE². Michigan State University, East Lansing, MI

¹Department of Entomology, 204 Center for Integrated Plant Systems, Michigan State University, East Lansing, MI USA ²Department of Plant Biology and Kellogg Biological Station, Michigan State University, East Lansing MI. USA.

The influence of species diversity on community invasibility is variably argued to be positive ('the rich get richer'), neutral, or negative (biotic or 'ecological resistance'). Across eight temperate deciduous forests in Southern Michigan that have been invaded by exotic plant species, we found a positive correlation between native and exotic species richness. However, the relationship between an exotic plant's (*Alliaria petiolata* [garlic mustard]) relative abundance and species richness within sites changed predictably from positive or neutral at species poor sites to negative at species rich sites, implying that different mechanisms are responsible for either promoting or resisting invasions in different communities. Further, the progression of invasions within sites with quadrats of varied species richness was correlated with site native species richness. We propose that environmental stress tolerance may contribute to limiting invasions in species poor assemblages, whereas competitive interactions are more likely to limit invasions in species rich communities. This suggests that neither biotic resistance nor 'the rich get richer' hypothesis satisfactorily explains patterns of invasibility. Rather, both serve as endpoints along a continuous gradient of resource competition and environmental stress tolerance.