Macroevolutionary processes can drive species richness patterns at very small spatial scales

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Abstract

A common paradigm in ecology is that macroevolutionary processes become increasingly unimportant for explaining species richness at smaller and smaller spatial scales. However, few studies (if any) have actually tested whether these processes do help explain richness patterns at very small scales. Here, we study richness patterns in plants from small-scale local plots in The Netherlands. We hypothesize higher richness in plots from habitats having greater estimated age and/or faster diversification rates among the sampled species. We inferred high age from high average distances among all species and faster diversification rates from low average distance among most cosely related species. We find that local richness of habitats increases with both the evolutionary age and the speed of diversification represented in local species communities. Richness of species pools of habitats increases with age, in particular if diversification is low. Our results show that macroevolutionary processes can matter at very small spatial scales.

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