COMMUNITY ECOLOGY

Density dependence

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Local abundance of different tree species constitutes a fundamental parameter of forest ecosystems. In tropical forest, it is believed that conspecific negative density dependence (CNDD) determines the high local density of trees, and maintains the diversity and dynamics of the forest community. Recently, Keping Ma's group in the Institute of Botany, Chinese Academy of Sciences, China, reported an investigation on the effects of soil fungal community on tree density in a subtropical forest located in East China, thus providing new mechanistic insights on the interspecific variation in CNDD.

In this study, Chen et al. combined measurements of long-term seedling survival and sequencing of fungal communities collected from the rooting zone of 34 tree species (322 individuals). They classified the tree species into three categories based on the type of their mycorrhizal association: AM (arbuscular mycorrhizal), EcM (ectomycorrhizal) and

ErM (ericoid mycorrhizal). Interestingly, they found that AM tree species are associated with higher ratios of pathogen sequences. Utilizing a modelling approach, they evaluated the strength of CNDD in the three groups of trees and disclosed different tree neighbourhood interactions at the community level. For instance, AM seedlings showed stronger CNDD than EcM and ErM species, indicating that the species under greater pathogen pressure may experience stronger CNDD. In support of this hypothesis, they found that pathogen accumulation rates negatively correlate with CNDD, while EcM fungus accumulation rates and CNDD are positively correlated. These all suggest that the soil fungal community plays an important role in the density dependence of trees.

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