Global diversity and geography of soil fungi

ABSTRACT

Fungi play major roles in ecosystem processes, but the determinants of fungal diversity and biogeographic patterns remain poorly understood. Using DNA metabarcoding data from hundreds of globally distributed soil samples, we demonstrate that fungal richness is decoupled from plant diversity. The plant-to-fungus richness ratio declines exponentially toward the poles. Climatic factors, followed by edaphic and spatial variables, constitute the best predictors of fungal richness and community composition at the global scale. Fungi show similar latitudinal diversity gradients to other organisms, with several notable exceptions. These findings advance our understanding of global fungal diversity patterns and permit integration of fungi into a general macroecological framework.