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Patterns and Internal Stability of Carbon, Nitrogen, and Phosphorus in Soils and Soil Microbial Biomass in Terrestrial Ecosystems in China: A Data Synthesis

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摘要 Inspired by the strict constraint ratio (relatively low variability) between carbon (C), nitrogen (N), and phosphorus (P) in global soils and soil microbial biomass, our study explores the biogeographic distribution of C:N:P stoichiometric ratios in soils and soil microbial biomass in China and seeks to identify areas with similar ratios. Our study also attempts to determine the impacts of soil and soil microbial biomass C:N:P in China and the factors determining the ratio. The element concentrations may vary in each phylogenetic group of soils and soil microbial communities in China’s terrestrial ecosystems, as they do in global terrestrial ecosystems. However, on average, the C:N:P ratios for soil (66:5:1) and soil microbial biomass (22:2:1) are highly constrained within China. Soil microbial biomass C, N, and P concentrations have relatively weak internal stability, while soil microbial biomass C:N, C:P, and N:P ratios do not have internal stability at the national scale and in different terrestrial ecosystems of China. Unlike plant N:P, which can be used as the basis for evaluations of nutrient restrictions, the use of soil or soil microbial biomass N:P to evaluate soil nutrients is not universal. Latitude is the main factor influencing the patterns of soil C, N, and P. Longitude is the main factor determining the patterns of soil microbial biomass C, N, and P. pH is the main nonzonal factor affecting the patterns of soil and soil microbial biomass C, N, and P. The findings of this study are helpful in understanding the spatial pattern of soils and soil microbial biomass and their influencing factors in regions with complex ecosystems. View Full-Text

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