

Multifractal analysis of soil invertebrates along a transect under different land uses

Glécio Machado Siqueira (1), Raimunda Alves Silva (1), Eva Vidal-Vázquez (2), and Antonio Paz-González (2)
(1) Department of Geosciences, UFMA. Federal University of Maranhão, Av. dos Portugueses, 1966, Bacanga, CEP 65080. 805, São Luís, MA, Brazil., (2) Centro de Investigaciones Científicas Avanzadas CICA, University of Corunna, 15071 Corunna, Spain.

Soil fauna play a central role in many essential ecosystem processes. Land use and management can have a dramatic effect upon soil invertebrate community. Indices based on soil invertebrates abundance and diversity are fundamental for soil quality assessment. Many soil properties and attributes have been shown to exhibit spatial variability. The aim of this study was to analyze the scaling heterogeneity of the soil invertebrate community sampled using pitfall traps across a transect. The field study was conducted at Mata Roma municipality, Maranhão State, Brazil. Transects were marked under seven different agricultural/forestry land uses (millet, soybean, maize, eucalyptus, pasture, secondary savannah and native savannah). Native vegetation was considered as a reference, whereas the agricultural fields showed a range of soil use intensities. Along these transects 130 pitfall per land use were installed. First, differences in community assemblages and composition under different land use systems were evaluated using classical indices. Then, the spatial distribution of soil fauna trapped by pitfall techniques, characterized through generalized dimension, D_q , and singularity spectra, $f(\alpha) - \alpha$, showed a well-defined multifractal structure. Differences in scaling heterogeneity and other multifractal characteristics were examined in relation to land use intensification.