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Book of Abstracts

Driving Factors for Communities of Nine Groups of Soil Organisms in Eastern Brazilian Amazon

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Brazilian Amazon is a huge reservoir of biodiversity, including below-ground organisms that mediate key process for the functioning of ecosystems. Determining the driving factors that shape the community structure of these organisms, including anthropogenic factors, is an important step toward understanding and managing sustainably these ecosystems. The diversity of nine groups of soil organisms (Culturable and unculturable Bacteria, microfungi, arbuscular micorrhizal fungi, nematodes, mesofauna, macrofauna, ants, termites and beetles) were studied in 98 sampling points which comprised six land uses: Primary Forest, Old Secondary Forest, Young Secondary Forest, Agroforestry, Agriculture, and Pasture. These sampling points were located in Benjamin Constant Municipality (Amazonas State, Brazil), Upper Solimões river, on the triple frontier of Brazil, Colombia and Peru and included the indigenous communities of Guanabara II (Ticunas) and Nova Aliança (Cocamos) and the town of Benjamin Constant. Here, we perform a variance partitioning for these nine groups of soil organisms into four matrices of explanatory variables: spatial structures, vegetation, edaphic conditions, land use, and the interrelationships among them. We also calculate the indicator value index for six of these groups of soil organisms. We found that land use change, either alone or with its associated changes in soil conditions and/or vegetation, explains significant proportions of the total community variation for seven of these groups. Despite the predominance of actively dispersed organisms in these groups, evidences of dispersal limitations were found in 55% of them. Many species in all land use systems were good indicators. However, beetles in Primary Forest and Agriculture as well as arbuscular mycorrhizal fungi and termites in Pastures had species with highest IndVal (>0.60). Thus, the communities studied for all nine groups of soil organisms are significantly associated with environmental conditions, and that, for five groups, spatial dynamics is also an important driving factor for community structure.

Keywords: microorganisms, microfauna, mesofauna, macrofauna