5.3. Land use impacts on soil macro-fauna biodiversity at catchment scale

Objective

- Develop a methodology for rapid characterization at the landscape scale of soil biodiversity of macrofauna

Methodology and Results

A methodology was developed that is based on a stratified sampling approach where local knowledge is used to define strata at the landscape scale. Strata are then sampled using a sampling design that makes use of fewer samples than suggested in other common approaches. The methodology developed demonstrates that land use classification based on local farmers' knowledge can serve as the basis for the implementation of soil biodiversity assessments.

Results were presented to the community of the study area in Pescador (Cauca) at two workshops, and a pre-grade thesis is currently submitted to the Universidad Nacional, Palmira. Furthermore, the collected data were analyzed, organized, and presented in conferences under the following aspects:

- Distribución y Abundancia de la Macrofauna Edáfica Asociada con Unidades Locales de Clasificación de Suelos en la Microcuenca Potrerillo, Cauca, Colombia (XI Congreso Colombiano de la Ciencia del Suelo, Septiembre 18-20, 2002).Muestreos comparativos de escarabajos coprófagos (Coleóptera: Scarabaeinae) para examinar pérdida de biodiversidad del Bajo Calima, Valle del Cauca (XXIX Congreso Sociedad Colombiana de Entomología).
- Exploración de la presencia y abundancia de la coleópterofauna edáfica en diferentes usos de la tierra en una microcuenca del Departamento del Cauca. Ponencia (XXXVIII Congreso Colombiano de Ciencias Biológicas, Octubre 1-4, 2002).

Figures 34 and 35 present an example that shows differences in abundance and density of earthworms and myriapods for four local land quality categories, including fertile land (buena), nutrient-mined land (cansada), physically degraded land (brava), and otherwise unproductive land (mala).

Based on this research, we will now develop practical indicators for rapid soil quality monitoring and diagnostic at landscape scale.

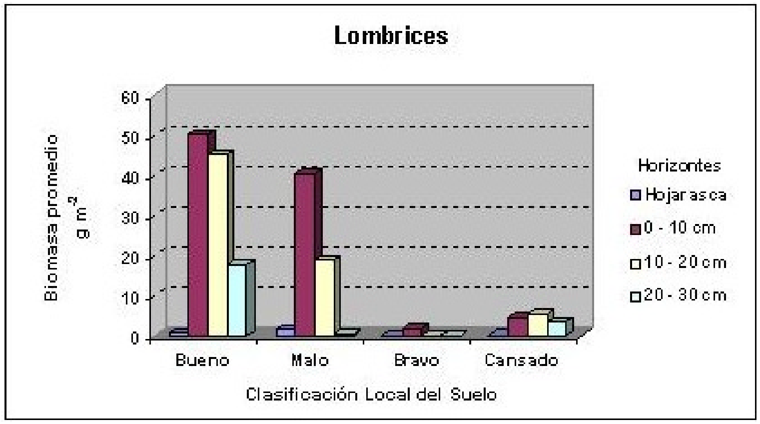

Figure 34. The biomass of earthworms (lombrices) in the leaf layer (hojarasca), and three soil horizons (0-10 cm, 10-20 cm, and 20-30 cm), sampled in four local land quality categories including good soil (bueno), nutrient-mined soil (cansado), physically degraded soil (bravo), and otherwise unproductive soil (malo).

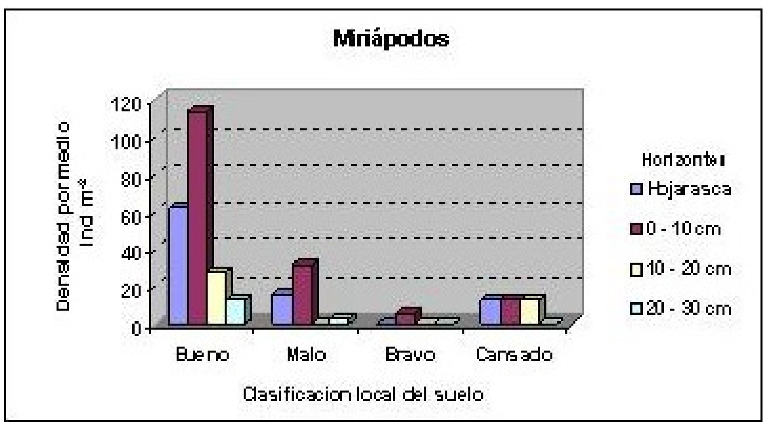

Figure 35. The abundance of myriapods in the leaf layer (hojarasca) and three soil horizons (0-10 cm, 10-20 cm, and 20-30 cm), sampled in four local land quality categories including good soil (bueno), nutrient-mined soil (cansado), physically degraded soil (bravo), and otherwise unproductive soil (malo).

Output

Increased, but sustainable, productivity through improved community-based soil fertility management.

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