Poster – Session 3

Earthworms in agroforestry systems and regenerating Atlantic forest in Barra do Turvo - SP and Adrianópolis – PR, Brazil

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Agroforestry systems (AFs) provide greater vegetation cover and soil protection, adding larger amounts of residues and organic matter that serve as food for soil fauna. Therefore, in this management system, populations and diversity of soil fauna tend to be higher than in more intensive land use systems. Nevertheless, there are few studies about earthworm communities in Brazilian AFs, and that compare populations in AFs with less intensive systems such as regenerating Atlantic Forest. Therefore, the present study was undertaken to evaluate earthworm populations in three AFs of 4, 8 and 16 yr of age, and in three secondary forests of 5, 20 and >30 yr of age, following the TSBF (Tropical Soil Biology and Fertility) program's standard sampling protocol. Two samples were collected in each of the three plots established in each land use system, totaling six samples per site. Earthworms were identified, counted, weighed and the results analysed using ANOVA's and principal components to evaluate relationships with site characteristics. Only four earthworm species were found, all exotic or peregrine: *Pontoscolex corethrurus* (Müller, 1857), *Amynthas gracilis* (Kinberg, 1867) and two unidentified species of the *Dichogaster* genus. The former species dominated the earthworm communities, representing over 90% of the total density and biomass of the study sites. A positive relationship between abundance and AF system age was found, especially for the more abundant species (*P. corethrurus)*. However, in the secondary forests, the inverse relationship was found, with lower earthworm abundance with increase in age of regeneration. Highest abundance was found in the 16 yr old AF (459 individuals m^{-2}) and in the 5 yr secondary forest (733 individuals m^{-2}); both systems had a very high biomass of aprox. 100 g m^{-2}. Earthworm abundance was positively associated with litter biomass and negatively related to soil clay and C content, bulk density, pH and base saturation.