

# Earthworm densities in central Amazonian primary and secondary forests and a polyculture forestry plantation

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Earthworms are known to be the most important group of soil animals in temperate regions of the world but their contribution to ecosystematic soil functions, especially litter decomposition, in the humid tropics remains largely unexplored. Therefore, the species composition, abundance and biomass of these organisms have been determined in a polyculture forestry plantation and in plots of nearby secondary and primary forest since 1997.

Contrary to recommendations from the literature, hand-sorting was not successful to collect the earthworms due to two reasons:

1. The individual size of the various species differs greatly (approx. 2 cm to 80 cm in length)
2. They are very inhomogenously distributed.

However, in a pre-study it could be confirmed that Formol-extraction in areas of 4 m<sup>2</sup> is an easy and quick method to sample earthworms qualitatively and quantitatively. Unfortunately, the use of mustard as a more natural and less toxic alternative to Formol as successful used in Europe was not efficient.

After three sampling dates in the period from July to December 1997 the following preliminary results can be presented:

The number of species is relatively low (approx. 5 - 10). Most if not all of them belong to the mainly neotropical family Glossoscolecidae. Up to now, none of these is described. No peregrine species (i.e. worms found circumtropical) were found, which is strange since especially *Pontoscolex corethrurus* is widely distributed in the area of Manaus.

Again, as far as can be assessed today, the abundance of earthworms in the three plots is low in comparison to other tropical humid rain forest sites (< 10 ind/m<sup>2</sup> compared to approx 50 ind/m<sup>2</sup> (based on just four studies!)). On the other hand, since most of the species living on the three investigation plots are very large, the amount of biomass is among the highest numbers ever found in rain forests (up to 20 g fresh weight per square meter).

Due to the limited amount of data gained so far, potential differences between the three plots and, in general, the role of these animals (e.g. the association of the individual species with one of the three main ecological groups of earthworms) in the study area is not clear yet. However, the enormous biomass of earthworms in all three plots indicates that they have a key function for processes like organic matter decomposition.