

The effects of two pesticides in semi-field and field tests under tropical conditions (Amazonia, Brazil)

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Usually, the environmental risk of pesticides is assessed using tests which are designed according to temperate conditions. For the compartment soil several laboratory tests are available while only few methods have been standardised on the semi-field and field level. In fact, only one ISO guideline (the Earthworm Field Test; ISO 11269-3) is fully accepted. Recently, the litter-bag test, measuring the effects of pesticides on organic matter decomposition in the field has been proposed to OECD (EPFES 2002). In parallel, the use of Terrestrial Model ecosystems (TMEs) as a terrestrial microcosm method for the semi-field level has been investigated in an EU-wide interlaboratory comparison study.

However, since temperate and tropical conditions (e.g. in terms of soil types, temperature and species) differ greatly, it is doubtful whether the results of "temperate" tests can be extrapolated to tropical ecosystems. To clarify this point, ecotoxicological studies were performed within the Brailian-German project SHIFT (Studies on Human Impact on Floodplains and Forests in the Tropics). In this contribution, a TME study and a field test done with a fungicide (carbendazim) and an insecticide (lambda-cyhalothrin) are described. The field site was an abandoned rubber plantation located 30 km north of Manaus (Amazonas, Brazil). Intact soil cores for the TME study were extracted from the same site. The soil was a Ferralsol (Yellow Latosol) with a low pH and few nutrients. While in different runs of the TME study native as well as standard test species were introduced, in the field study the abundance and diversity of the local fauna were used as measurement endpoints. In addition, the functional endpoints organic matter breakdown and the feeding rate were measured using the litter-bag test and (partly) the bait-lamina test. From a technical point of view, the test methods originally developed for temperate conditions could easily be modified for the conditions of Amazonia.

Summarising the results of these tests it seems that both pesticides can have an impact on organic matter breakdown at field relevant concentrations. In addition, some organism groups were significantly affected on both investigation levels. Carbendazim, known to be toxic for oligochaetes, decreased the abundance of the introduced earthworm species *Pontoscolex corethrurus* in the TMEs and of a native species (*Andiorrhinus amazonicus*) in the field. The insecticide lambda-cyhalothrin was toxic to isopods and millipeds in the TMEs, but did not affect arthropods in the field one year after application; probably due to recolonisation of the relatively small field plots.

Besides presenting the modified test methods and the results of the various test runs, a preliminary risk assessment of these two pesticides under tropical conditions is intended in this contribution.

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