

RESEARCH NEWS

IMPACT OF AGRO CHEMICALS ON SOIL MICRO-ARTHROPOD DENSITY IN DIFFERENT FARMING SYSTEMS: A CASE STUDY AT MANDARAMNUWARA

R.G.S. IROSHANI¹ and K. MOHOTTI²

¹*In-Service training Institute, Angunakolapelessa, Sri Lanka* ²*Tea Research Institute, Thalawakele, Sri Lanka*

Depletion of soil biodiversity could affect soil productivity and crop production systems. Heavy use of agrochemicals and chemical fertilizers has caused reduction in biological diversity in agricultural areas (Mohotti, 2000). Micro-arthropods are an important component in soil biodiversity. Soil micro-arthropods affect the physical and chemical properties of the soil. In addition, mites, myriopeds and collombolans also participate in litter fragmentation and mixing litter with soil, affecting water intake and percolation rates. Soil micro arthropods are a good indicator of soil biodiversity as they are the most affected part by agrochemicals due to their soft bodies (Wallwork, 1970; Chhonkar and Pareek, 2000). In addition, reduction of microarthropods is caused by disturbances in their micro-habitats due to modern agricultural practices (Chhonkar and Pareek, 2000). A study was conducted to identify the status of micro-arthropod density in different farming systems and compare their status in HIAS (High Intensive Agricultural System) with organic farming system.

Undisturbed natural forests, organic fields, home gardens, and intensively cultivated vegetable lands were selected from Mandaram Nuwara in the Nuwara Eliya District, Sri Lanka, for the study. Population of micro-arthropods was determined by using the Berlese funnel system (Anderson, 1982). Micro-arthropods were counted into four categories namely, insects, collombolans, mites and myriopeds. Among these, collombolans are the most important category by being a good indicator of a healthy soil.

The highest population densities of micro-arthropods of all categories were identified in the soils of natural forests. Population and species diversity was significantly lower in the conventional farming systems ($p < 0.05$). Conventionally managed soils in the vegetable fields showed a significant reduction in the micro arthropods density and species diversity ($p < 0.05$).

The results indicated that soil micro arthropod density has been decreased in agricultural lands. This may be due to the heavy use (higher frequency and 5 to 10 times higher amounts than the recommended levels) of agro-chemicals. A higher soil micro-arthropod density and diversity were

observed in organic fields and home gardens than the high intensive agricultural systems.

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