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## Biodiversity of Arthropods and their Movement Patterns in the Upland Landscape of Leyte, Philippines

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### Abstract

In the humid tropics of SE-Asia the last primary forests are dwindling at an alarming rate. In the upland of Leyte island this is due to commercial and illegal logging activities and intensive slash and burn agriculture. The loss of the natural vegetation cover is accompanied by a decrease in diversity of fauna and flora, consequently also in ecosystem services and interactions, thus destabilizing the system and finally leading to degradation.

The study approached two questions: Which structures and components of the cultural landscape are of significance for conserving arthropod biodiversity, and, which of the forest species are able to become resident in the managed system? It was focused on interchanges of insects between the natural and the managed landscape.

Insect and plant communities and the movement patterns of selected insect species were examined along a gradient from the natural forest through the agricultural land. On the cultivated land, the cropping patterns were mapped and weed populations examined. In the forest, occurrence and distribution of trees, ferns, bushes and herbs were considered.

Insects were caught by using modified malaise-traps, which allowed a separate catch for each of the two arrival sides, whereby the one was always opened to the forest and the other to the field. Four traps were used, considering the forest interior, the forest edge and the cropping area. Traps were circulated between three sites for a total of 18 months in 2001 and 2002. Shannon diversity and evenness of the whole catch were calculated for each arrival side of all traps and compared. It was found that arthropod diversity in and also oriented to the forest is higher than in and oriented to the field. Highest values were found at the forest edge. Movement pattern of the selected pest species showed, that the most dangerous pests are monophagous and were probably introduced with their host plants. Movement pattern of selected forest species showed decreasing penetrations into the cultivated land with increasing distance to the forest. Natural forest species which are able to become resident in the diverse agroecosystem could not be found.

**Keywords:** Tropical agroecosystems, upland farming, arthropods, biodiversity, Philippines