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Ecological and Socioeconomic Functions of Tropical Lowland Rainforest Transformation Systems Sumatra, Indonesia

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B06 **Taxonomic, phylogenetic, functional, and biogeographical diversity of vascular plants in rainforest transformation systems on Sumatra**

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Vascular epiphyte diversity in different transformation systems in Sumatra

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The worldwide loss and degradation of tropical rainforests caused by deforestation and transformation into agricultural land also affects epiphyte communities. Due to their arboreal habitat, epiphytes are very sensitive towards changes in microclimatic conditions, making them an excellent model group to study the consequences of land cover change. Therefore, we investigated the consequences of transformation from lowland rainforest into monocultures for vascular epiphyte diversity in Jambi Province (Sumatra, Indonesia).

In total, 90 study plots (20 x 20m) were established in Bukit Duabelas National Park and surrounding oil palm and rubber plantations (30 plots per transformation system). Each plot contained one main phorophyte which was investigated for vascular epiphytes. Additionally, all vascular epiphytes growing within a 2m zone above the base of each tree within the plot were recorded.

Figure 1: Plot design with central phorophyte devided in 5 zones after Johansson 1974.

We found a total of 54 epiphyte species belonging to 18 different families. While oil palm plantations contained the highest number of individuals (80% of all individuals), forest plots had a much higher species richness (83% of species) compared to oil palm and rubber plantations (Fig. 2, 3).

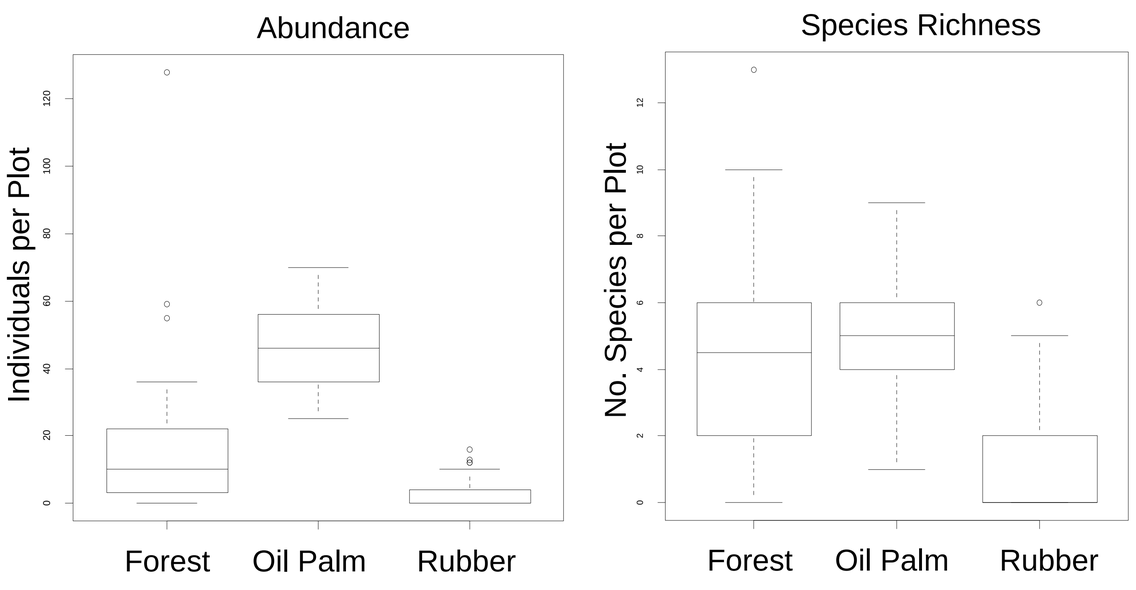

Figure 2: Epiphyte abundance and species richness per plot in different transformation systems.

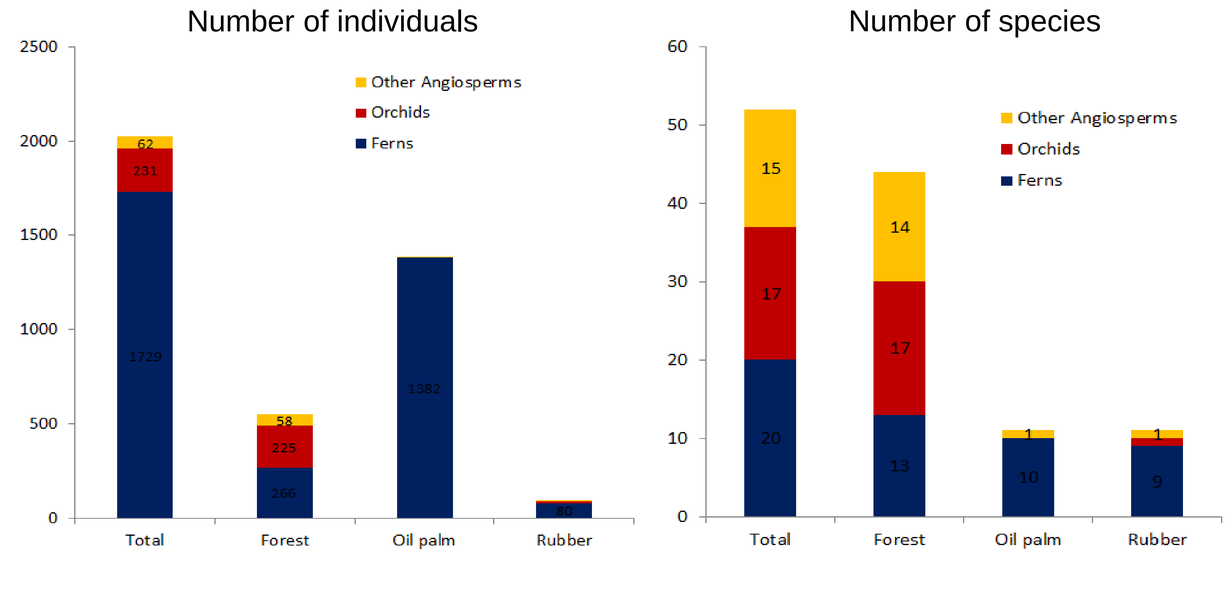

Figure 3: Total epiphyte individual and species numbers in different transformation systems.

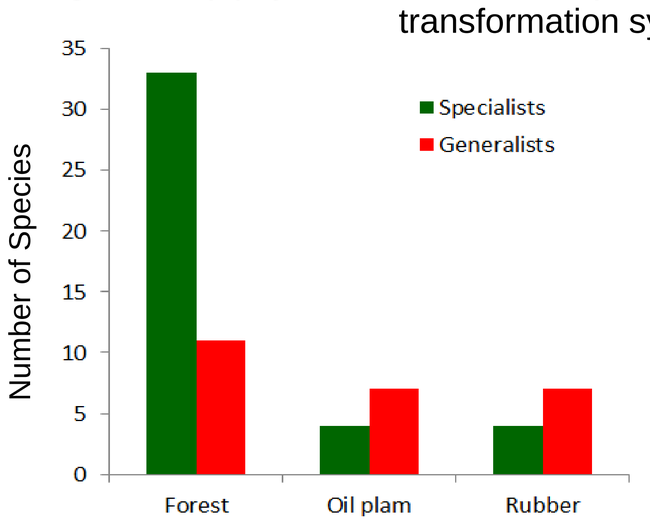

Figure 4: Number of gerneralist and specialist species.

Further, epiphyte communities in plantations showed higher rates of generalists (i.e. species occuring in more than one transformation system) while forest epiphyte communities were rather composed by specialists (Fig. 4).

The low species diversity in plantations can be explained by more homogenous microclimatic conditions in the Johansson zones compared to forest trees. Further reasons are age and distance to the species pool in the forest.

Thus, even if epiphytes are very abundant in oil palm plantations, forest transformation clearly causes a loss of epiphyte diversity!