Research project of counterparts funded at IPB

Name	Counterpart	Title
Damayanti Buchori, Akhmad Rizali	**B09**	Effect of land-use types on species diversity and composition of insect pollinators in Jambi

Background and Objectives

Insect pollinators are a group that plays an important ecosystem role. However, their presence can be affected by land use changes as is the case for ants (Rubiana *et al*., 2015). The objectives of this research are therefore to investigate the effect of land-use types, both in wet and dry sites, on the species richness and the composition of insect pollinators in Jambi.

Methods

The ecological research was conducted from August to October 2017 in the Harapan landscape in wet and dry sites. Each site contained different land-use types i.e. secondary forest, oil palm plantations, and rubber plantations. Insect pollinators were collected by direct sampling (insect net) and traps (malaise, yellow pan and yellow sticky traps). Direct sampling was conducted on flowering plants and all traps were placed around flowering plants inside 50x50m plots.

Results

In total, we found 442 individuals belonging to 3 insect orders (Hymenoptera, Lepidoptera, and Diptera). These 442 fell into 47 pollinator morphospecies. Analysis of variance showed that species richness differed significantly between land-use types ($F_{2,20}$=7.052 P=0.004) but not between different sites (i.e. wet vs dry) ($F_{1,20}$=0.191 P=0.666). The abundance of insect pollinators was also significantly different between land-use types (F2,20=5.242 P=0.014), but not between sites ($F_{1,20}$= 0.087 P=0.7706). The abundance of insect pollinators was higher in oil palm and rubber plantations than in secondary forest. This indicates that insect pollinators prefer an open canopy (oil palm and rubber plantations) than a dense canopy (secondary forest). The species composition of insect pollinators differed significantly between land-use types in the dry site (R=0.760, P= 0.002) but not in the wet site (R=0.218, P= 0.073). Some species seem to be more different between land use types than others. For example, the genus *Tetragonula* (Hymenoptera: Apidae) were more highly abundant in secondary forest than in oil palm and rubber plantations, whereas *Ceratina* spp. (Hymenoptera: Apidae) and *Ypthima* spp. (Lepidoptera: Nymphalidae) were more highly abundant in rubber and oil palm plantations (figure 1).
In conclusion, land-use types have an impact on the presence of insect pollinators both in richness and abundance.

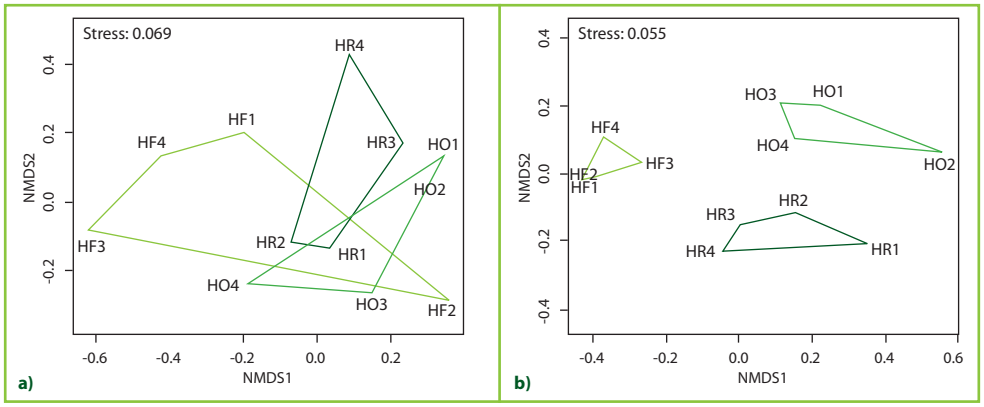

Figure 1. NMDS ordination of species composition of insect pollinators between land-use types in (a) the wet site and (b) the dry site based on Bray-Curtis dissimilarity index (HF = Secondary Forest; HR = Rubber Plantation; HO = Oil Palm Plantation).

References

[1] Rubiana, R, Rizali A, Denmead L, Alamsari, W, Hidayat, P, Pudjianto, Hindayana, D, Clough, Y, Tscharntke, T, Buchori, D. 2015. Agricultural land use alters species composition but not species richness of ant communities. Asian Myrmecology (7): 1–13.