

Ants are Important for Maintaining Optimal Ecosystem Functioning in Oil Palm Plantations

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ABSTRACT

Ants are a highly important component of tropical ecosystems, playing roles as predators, herbivores, seed dispersers, disease regulators, and drivers of soil properties. We have assessed their importance in maintaining optimal ecosystem functioning within oil palm plantations in Riau, Sumatra. The ecosystem functions we measured included insect biodiversity, herbivory, herbivore predation, bioturbation, soil physical and chemical properties, decomposition rates, and oil palm health and yield. In particular, we investigated how the role of ants changed throughout the process of replanting, and whether it was affected by different management actions which alter understory vegetation structure.

Using a series of manipulative exclusion experiments that lasted one year we determined that ants are indeed important for maintaining optimal ecosystem functioning. In the plots where ants were excluded we found that ecosystem functioning was compromised, for example there were reduced levels of herbivore and seed predation. These results highlight the value of biodiversity for the production of palm oil and the importance of developing and implementing ecofriendly management practices to support the development of more sustainable oil palm.