



Local and Landscape Compositions Influence Stingless Bee Communities and Pollination Networks in Tropical Mixed Fruit Orchards, Thailand

Kanuengnit Wayo¹, Tuanjit Sritongchuy², Bajaree Chuttong³, Korrawat Attasopa³ and Sara Bumrungsri¹

¹*Department of Biology, Division of Biological Science, Faculty of Science, Prince of Songkla University, Hat Yai, Songkhla 90110, Thailand;*

²*Center for Integrative Conservation, Xishuangbanna Tropical Botanical Garden, Chinese Academy of Sciences, Mengla, Mengla 666303, China*

³*Department of Entomology and Plant Pathology, Faculty of Agriculture, Chiang Mai University, Chiang Mai 50200, Thailand,*

KEYWORDS: agriculture; floral resources; forest proximity; land-use change; meliponine; plant–pollinator interaction; urbanization

INTRODUCTION:

Stingless bees are vital pollinators for both wild and crop plants, yet their communities have been altered by anthropogenic land-use change. Additionally, few studies have directly addressed the consequences of land-use change for meliponines, and knowledge on how their communities change across gradients in surrounding landscape cover remains scarce.

OBJECTIVES:

Here, we examine both how local and landscape-level compositions as well as forest proximity affect both meliponine species richness and abundance together with pollination networks across 30 mixed fruit orchards in Southern Thailand

RESULTS:

The results reveal that most landscape-level factors significantly influenced both stingless bee richness and abundance. Surrounding forest cover has a strong positive direct effect on both factors, while agricultural and urbanized cover generally reduced both bee abundance and diversity. In the local habitat, there is a significant interaction between orchard size and floral richness with stingless bee richness. We also found that pollinator specialization in pollination networks decreased when the distance to the forest patch increased.

CONCLUSIONS:

Both local and landscape factors thus influenced meliponine assemblages, particularly the forest patches surrounding an orchard, which potentially act as a key reservoir for stingless bees and other pollinator taxa.