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INFLUENCE OF THE BEHAVIOR OF WILD BEES (HYMENOPTERA: APOIDEA) AND THE PRESENCE OF VIRUSES IN COFFEE PRODUCTION

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ABSTRACT

Many studies investigate how the diversity of floral visitors and changes in their communities affect coffee production. However, very few studies have focused on understanding how insects visiting behaviour and the presence of Honeybee virus affects coffee production, especially in Central America. Here we assessed how foraging behaviour (flower visitation-rate, collection time in flowers and contact stigma/anther) of honey and stingless bees and the presence of Honeybee virus affect coffee pollination (fruit set of flowers) in conventional and organic crops. We quantified the prevalence of honeybee virus, local floral resources, diversity of bees and recorded the behaviour of each of the most common species when visiting coffee flowers. We found that the managed honeybee *A. mellifera* and three wild bees *T. angustula*, *S. mexicana*, and *P. bilineata* are the principal floral visitors of coffee crops in Guatemala, whose total abundance but not richness was higher in agroecological areas. Regarding their behaviour, we observed that *P. bilineata* time spent on flowers were positively related with both fruit weight and fruit set, the average number of flowers visited by *P. bilineata* was also positively related to fruit set, while only the percentage of *A. mellifera* collecting pollen was positive related with fruit weight, suggesting that although *A. mellifera* is found in large quantities, wild bees are more efficient pollinators of coffee in the region. Regarding virus prevalence we found that only *A. mellifera* populations presented high prevalence emphasizing the importance of conserving wild pollinators to improve the production of cash crops.