The biodiversity and farmer practices in different climate and their effect on the infestation rate of coffee berry borer

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Rationale:

The coffee berry borer (CBB), *Hypothenemus hampei* (Coleoptera: Scolytinae) is a major coffee pest in all coffee producing countries, including Indonesia [1] causing important yield and economic losses [2]. CBB incidence can be modulated by farmers' practices, biotic and abiotic factors. In this study, we propose to investigate the effects of all these factors on CBB infestation rate in two regions of Indonesia, Simalungun Regency in North Sumatra) and Bandung Regency in West Java). Both regions are mainly composed of Arabica coffee plantations [3]. The North Sumatra region is submitted to an equatorial climate which has a bimodial type of rainfall whereas the West Java region is a typical tropical humid climate with only one peak of rain.

Methods:

In this study, twenty study plots/region were selected at an altitude around 1200m, with two levels of practices regarding CBB control (10 farms with control strategy and 10 farms without control) and based on the number of associated trees species. In each farm, all coffee berries (attaked or not by CBB) were counted on 120 branches on 30 randomly selected trees during five months (from January to May 2023). Infestation rate of CBB was calculated monthly. Farmers used to associate more trees species to coffee plantation in North Sumatra (14 max) than in West Java (5 max).

Results:

Global incidence of CBB is higher in North Sumatra than West Java whatever the level of associated treel. The climate effect on this dynamics is under investigation. The effect of the number of associated trees species on CBB incidence is still unclear. We assumed that the effect of associated biodiversity on CBB is linked to microclimate modification and additional data are needed to confirm that. Our result demonstrated that control strategies implemented by farmers are efficient to reduce CBB infestation

Conclusions & Perspectives:

Results obtained in this study have never been published for these regions. Based on these results we will adapt an existing agent-based model developed in Costa Rica on CBB infestation rate dynamics. This model will then be presented o Iindonesian farmers to support implementation of efficient control strategies that are adapted to local context.

References:
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