

Impacts of 2 species of predatory Reduviidae on bagworms in oil palm plantations

ABSTRACT

Integrated pest management (IPM) is widely practiced in commercial oil palm agriculture. This management system is intended to minimize the number of attacks by pest insects such as bagworms on crops, as well as curb economic loss with less dependency on chemical pesticides. One practice in IPM is the use of biological control agents such as predatory insects. In this study, we assessed the response of predatory natural enemies to pest outbreak and water stress, and document the habitat associations of potential pest predators. The abundances of 2 predatory insect species, namely *Sycanus dichotomus* and *Cosmolestes picticeps* (Hemiptera: Reduviidae), were compared bagworm outbreak sites and nonoutbreak sites within oil palm plantations. We also examined habitat characteristics that influence the abundances of both predatory species. We found that the abundance of *C. picticeps* was significantly higher in bagworm outbreak sites than in nonoutbreak sites. There were no significant differences in the abundance of *S. dichotomus* among outbreak and non-outbreak sites. Both species responded negatively to water stress in oil palm plantations. Concerning the relationship between predatory insect abundance and in situ habitat quality characteristics, our models explained 46.36% of variation for *C. picticeps* and 23.17% of variation for *S. dichotomus*. Both species of predatory insects thrived from the planting of multiple beneficial plants in oil palm plantations. The results suggest that *C. picticeps* can be used as a biological agent to control bagworm populations in oil palm plantations, but *S. dichotomus* has no or little potential for such ecosystem service.

Keyword: Bagworms; Beneficial plants; Biological control; Habitat quality; Integrated pest management; Oil palm; Predatory insects