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## Identification of insect pests that attack the coconut plants in Jepara regency

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# Identification of insect pests that attack the coconut plants in Jepara regency

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**Abstract.** Jepara regency is a famous coconut producer. However, its coconut production continues to decline over times. The purpose of the study was to identify the species of insect pests that attack the coconut plant. Research method was done by observation in the field to record insect pests that attack the coconut plants. Location of observation was in three villages of Jepara regency. Insects were identified by morphological features. Insects' identification was performed in the biology laboratory of Universitas Negeri Semarang. Observation results showed that there were two species of insects attacking the coconut plants i.e. *Oryctes rhinoceros* and *Brontispa longissima*. The results of this research are expected to provide information that is useful to determine the right pest control strategy in coconut plantation.

## 1. Introduction

Indonesia is the major producer of coconut (*Cocos nucifera* L.), with an annual production of nearly 15,000 million nuts [1]. Coconut plants are one of the important commodities for Indonesian people regarding their role as the main source of vegetable oil. Coconut is also an export commodity and able to provide the country's foreign exchange. Coconut plantation is a source of farmers' income and as a provision of employment that can absorb a lot of labor [2].

According to BPS (Statistics Center Bureau), coconut production in Jepara had declined from 11,114 tons to 9,663 tons [3]. The decline in coconut production in Jepara was caused by several factors, one of them was the number of pest insects [4]. Insect pests that attack plant leaves can inhibit the photosynthesis process of the plants. Insect pests that attack the stem can inhibit the flow of food throughout the plant. Therefore, it is necessary to identify the types of insects that attack the coconut plants. Result of the identification process is expected to provide information than can be used to control the insect pests precisely.

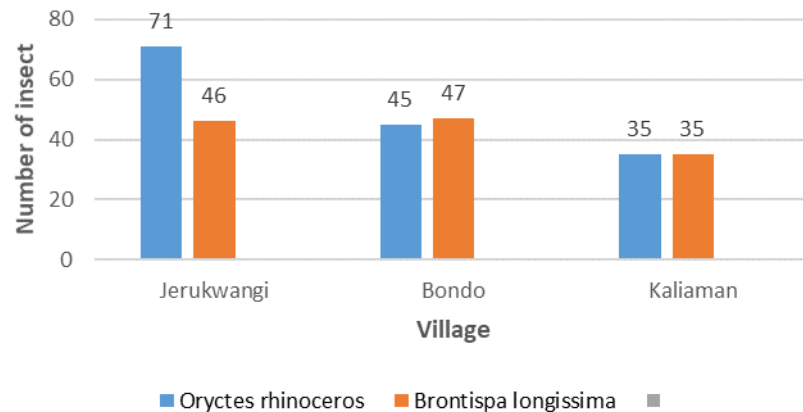
## 2. Methods

This research was conducted in Jerukwangi, Bondo and Kaliaman villages in Bangsri District, Jepara Regency in April-July 2018. The population of coconut plants were 705 trees. As many as 10% of population were used as samples in each village. Insect sampling was carried out in three ways, i.e. 1) direct sampling, 2) sweep net and 3) traps with pheromones. Data of the attack intensity by pest insects were analyzed descriptively.



### 3. Results and Discussion

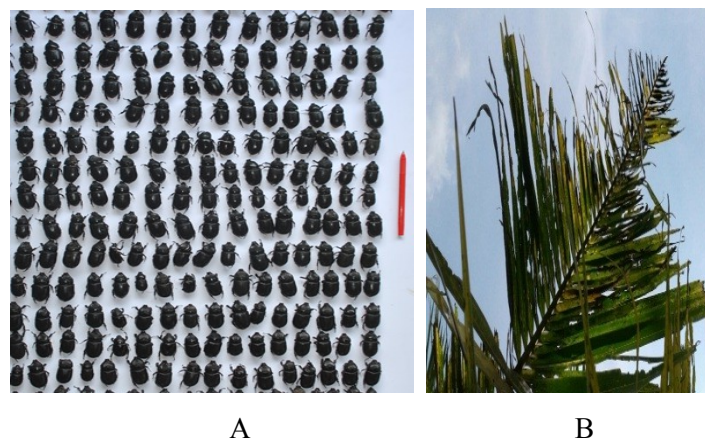
Results of observations of insect species that attack coconut plants in Jerukwangi, Bondo and Kaliaman Villages shows that there were two major insect species: *Oryctes rhinoceros* (Coleoptera: Scarabaeidae) and *Brontispa longissima* (Coleoptera: Chrysomelidae) (Figure 1).



**Figure 1.** Insect pests attacking coconut plants in the village of Jerukwangi, Bondo and Kaliaman

*O. rhinoceros* was the most destructive insect that attacks coconut plants, especially in Jerukwangi village (Fig. 2). This finding is in line with study by Indriyanti et al. [5] that found that *Oryctes rhinoceros* was the most serious pest of coconut plantations in Indonesia.

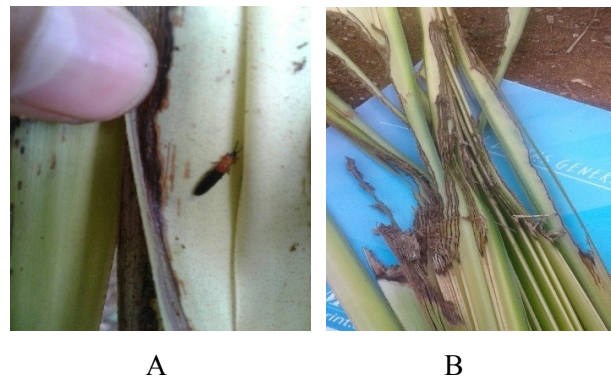
Beetles lay their eggs in dung or organic waste, then the growing larvae will eat them. After growing up, adult beetles attack the shoots causing young leaves to become damaged.



**Figure 2.** *O. rhinoceros* beetle (A), Evidence of *Oryctes rhinoceros*'s attack, V-shaped broken leaves (B)

The attack of *O. rhinoceros* was high because the farmers did not control these pests resulted in an increase of pest populations every time. Moreover, the cleanliness of coconut plantation land in Jerukwangi, Bondo and Kaliaman villages was not good. Many farmers have cattle and there were also many coconut planting areas near cattle or goat's corrals. Whereas the accumulated manure can be used as a breeding site for *O. rhinoceros* larvae.

Based on observations, coconut plants that grow near the corrals of livestock tend to suffer more damage than plants that are planted farther from the corrals area. The observations showed that the plant spacing of coconut trees in the village tends to be close one another. This causes the pests to quickly move from one plant to another [6]. Besides *O. rhinoceros*, the other pests that attack coconut plants in Jerukwangi, Bondo and Kaliaman was *Brontispa longissima* (Fig.3). Larvae and imago of *B. longissima* beetles were found attacking young leaves of coconut plants. This attack caused the leaves to dry out [7]. The coconut hispine beetle, *B. longissima* is one of the most invasive and destructive pests of Palmae plants, harming nearly every palm species with primary damage to coconut palm [8].



**Figure 3.** *B. longissima* Beetle (A). The leaves attacked by *B. longissima* (B)

The attack of *B. longissima* generally occurs in poor sanitation. These pests also attack coconut plants in Timor Leste [9]. Larvae attacking shoots through the entrance of young midribs that are not fully open. Female beetles will lay eggs, then the eggs hatch into larvae and the larvae develop into pupa and imago. All stages of insect pest development can be found in one plant. Imago and larvae are the most damaging stages of insect pest development. Results of this study provide information that can be used to determine the right pest control strategies. One of the pest control strategies is by using the entomopathogenic fungus *Metarhizium anisopliae*.

#### 4. Conclusion

There were two species major of Insect pests that attack the coconut plants in Jepara were *Oryctes rhinoceros* and *Brontispa longissima*.

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