EM 06

Assessment of Insect Damage and Growth Performance of Dipterocarps Planted at Rainforestation Demonstration Farm at VSU, Baybay City, Leyte

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ABSTRACT

Assessment of associated insects as well as leaf damage caused by the insect are essential concerning decisions to contribute to developing suitable rehabilitation techniques. Few studies have been done to identify the insect species associated with dipterocarp species and determine the damage caused by insects and their growth performance. Six species of dipterocarps, namely: Dipterocarpus alatus (hairy leaf apitong), Hopea philippinensis (gisok-gisok), Shorea malibato (malibato), Shorea philippinensis (manggasinoro), Shorea polita (malaanonang), Shorea almon were studied. This study was conducted to determine the insect associated fauna using the visual and handpicking method of insect collection, leaf damage assessment using the Bioleaf app, and the morphological traits (i.e., basal diameter and plant height) on growth performance of dipterocarps.

There were eight orders of insects associated with the dipterocarps: Coleoptera, Diptera, Hemiptera, Heteroptera, Hymenoptera, Lepidoptera, Odonata, and Orthoptera. There was a significant difference ($p \leq 0.05$) in the leaf damage among the six dipterocarps species after 25 months from planting. Shorea philippinensis had the highest leaf damage (8.68% ± 0.09), and Shorea almon had the least leaf damage (2.57% ± 0.09). In terms of basal diameter, the species with the highest significant increment ($p \leq 0.05$) was Shorea polita (2.49 ± 0.67 mm), while Shorea almon had the least growth increment (0.98 ± 0.67 mm) 25 months after planting. For the plant height, Dipterocarpus alatus grows faster compared to other species with a significant increment ($p \leq 0.05$) of 32.90 ± 0.19 cm, while Shorea philippinensis had the least increment of 4.95 ± 0.19 cm.

The study indicated eight orders of insects associated with the dipterocarps showing the significant damage on the S. philippinensis. Despite the insect association, the plants grow significantly with the fast increase observed on D. alatus.

INTRODUCTION

- Insect herbivores are among the many biotic factors which are known to help maintain forest diversity through selective predation on seedlings of vulnerable tree species altering forest community composition (Norghauer & Newbery 2013)
- Annual rates of leaf damage are higher in tropical forests than in temperate broad-leaved forests (Coley & Barone, 1996). The tropics incur higher rates of damage despite the fact that tropical plants tend to be better defended.
- According to Leigh et al .1997, the high damage rates in the tropics must be due to greater pressure from herbivores, though few studies have attempted to measure the biomass of herbivores in different forests.
- Assessing the damage caused by insect is important with respect to assisting experts to take better decisions to contribute to efforts of developing suitable rehabilitation techniques and also to recommend favorable dipterocarp species that can stand insect herbivory.

OBJECTIVES

1. To identify the insect species associated with the dipterocarps planted in the dipterocarp germplasm
2. To assess the leaf damage of insects and growth performance of dipterocarps planted in the dipterocarp germplasm of VSU, Baybay City, Leyte

MATERIALS AND METHODS

1. Location of the Study Site
2. Assessment of Insect Fauna Associated with dipterocarps Using the Visual and Handpicking Method
3. Assessment of Leaf Damage Using the Bioleaf App
4. Data Encoding and Statistical Analysis

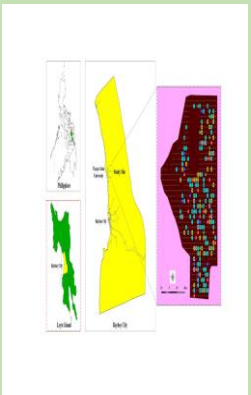

Fig. 1 Location of the study site

(a) **Fig. 2 (a) Assessment of insect fauna associated with dipterocarps, (b) Measurement of growth parameters.**

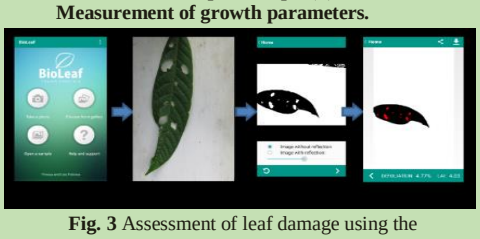

Fig. 3 Assessment of leaf damage using the Bioleaf app.

RESULTS

A. Associated Insect Fauna with the Dipterocarp Species

Fig. 4 Insect fauna associated with dipterocarp species

B. Leaf Damage

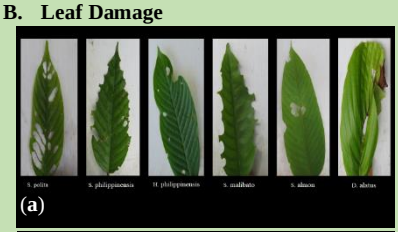

Fig. 5 (a) Leaf damage samples of six dipterocarp species.

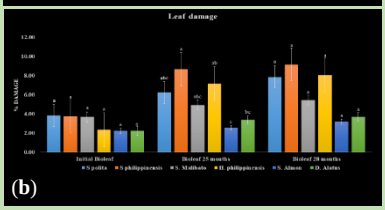

Fig. 5 (b) Percentage damage of leave of six dipterocarp species. *Values with different superscript letters (a-c) across major islands are significantly different at $p \leq 0.05$.*

C. Growth Performance of Six Dipterocarp Species

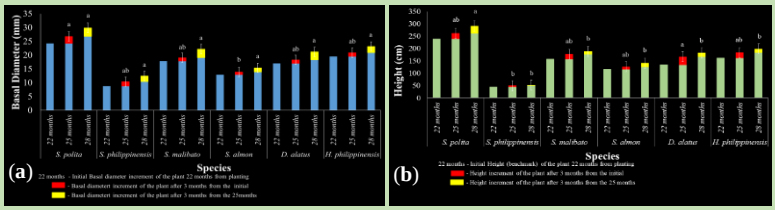

Fig. 6 (a) Basal diameter increment of six dipterocarp species, (b) Height increment of six dipterocarp species. *Values with different superscript letters (a-b) across major islands are significantly different at $p \leq 0.05$*

DISCUSSIONS AND CONCLUSIONS

- Assessment on the dipterocarps of Visca, Baybay City, Leyte, revealed that there is diversity among the insect species associated with dipterocarps.
- There are eight orders of insects associated with dipterocarps, namely: Coleoptera, Diptera, Hemiptera, Heteroptera, Hymenoptera, Lepidoptera, Odonata and Orthoptera.
- There was a significant difference on the leaf damage among the six species of dipterocarps during the data collection 25 months after planting. *Shorea philippinensis* had the highest leaf damage (8.68% ±.087) and *Shorea almon* had the least leaf damage (2.57% ±0.087).
- Growth performance of the different dipterocarp species showed increments and variations after a 3-month sampling period which was 25 months after planting. Initial data started at about 22 month-old dipterocarp trees.
- In terms of basal diameter, the species with the largest growth increment was Shorea polita (2.49mm ± 0.67) while *Shorea almon* had the least growth increment (0.98 ± 0.67)
- For the plant height, *Dipterocarpus alatus* (32.90 cm ± 0.19) had the largest increment, while *Shorea philippinensis* (4.95 cm ±0.19) had the least increment.
- The study indicated eight orders of insects associated with the dipterocarps showing the significant damage on the *S. philippinensis*. Despite the insect association, the plants grow significantly with the fast increase observed on D. alatus

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