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INSECTS IN TEAK*(Tectona grandis L.F)* IN THEFOREST AREA OF PASSO VILLAGE CITY OF AMBON MALUKU

Fransina LATUMAHINA
Lecturer Of Agriculture Faculty, Pattimura University Ambon Maluku Indonesia
E- mail : fransina.latumahina@yahoo.com

Abstract, Teak is the forest species with the highest economic value in Indonesia. It is especially important to many villages in Maluku Province.In order to manage for maximum profitability we need to first understand the pest species attacking this valuable tree species and to determine how much damage is caused. species were identified, and the intensity of pest attack determined.We identified two species acting as major pests;the lady bug , (Coccinella magnifica) and the snoutbeetle**(**Orchidophilus aterrimus).The snout beetleand the lady bug were associated with severe damage on 64% and 56% respectively of the trees sampled although the intensity of damage was low to medium

Key Words*:** Teak (*Tectona grandis*),Lady bug (Coccinella magnifica), Snoutbeetle(****Orchidophilus aterrimus*)

Introduction

Teak (*Tectona grandis*Linn. F) is a tree with high economic value in Indonesiabut pests cause a significant decrease in both the quality and quantity of the wood. Some of the common pests found attacking teak (*Tectona grandis* Linn. F) are *Xyleborus destruens* Blandford (scolytid borer) *Hiblaea puera* (Cramer) (teak defoliator), *Pyraustista machaeralis* (Walker) (Lepidoptera: Pyralidae), (Teak leaf skeletoniser)*Neotermes tectonae* (Dammerman) (termite) and *Captotermes curviquanthus* (termite).

The research in this paper provides information about the major type of pests causing damage to teak trees planted in the Passo Village forest area. We also describe the intensity of damage.

Methods

Sites

Thepest damage surveyswere carried out in the Passo Village forest plantation area, Ambon city fromJuly 2009 until August 2009. Pests were identified at the Basic Biology Laboratory FKIP Pattimura University Ambon during September 2009 using pest manuals by Borror *et al*.(1992) and Achmad Sultoni and Kalsoven (1981).

Sampling and calculation of pest intensity

The survey area was 1 hectare in which five 25m x 25m plots were established 20 years old Samples were collected and pest damage assessed across diagonal transects in each (14 teak trees per plot and a total of 70 trees from all plots). The percentage of trees attacked by a pest was calculated and allocated to a category describing the extent of damage (Table 1).

Table 1. Extent of damage (Source: Natawigena, 1982)

Score f trees attacked)	Description of extent of damage in plantation
0	Normal
0 ≤to≤ 25	Light
25 ≤to≤ 50	Average
50 ≤to≤ 75	Heavy
100	Very heavy

To calculate the intensity of pest damage we used the formula established by Natawigena, 1982 and cited in Sugiharso, 1988.

$$P = \frac{\sum(nxv)}{ZxN} \text{ x } 100\%$$

Where :
P = damage intensity
n = leaf area per tree in score (v)
v = score (Table 2)
Z = highest score
N = total leaf area observed

Table 2. Scores for damage intensity

Score	% leaf area damaged	Description of damage
0	0	Normal
1	0 ≤ to ≤ 25	Light
2	25 ≤to≤ 50	Medium
3	50 ≤to≤ 75	Heavy
4		

Results and Discussion

Major pest species identified

Pests common to the forest plantationsof Passo Village Ambon city were the lady bug or ladybird(*Cocinella magnifica*)Coleoptera:Coccinellidaeand the snout beetle(*Orchidophilus aterrimus*)Coleoptera: Curculionidae.

Adult *C. magnifica*have wide oval to roundbodies,are brightly coloured yellow, orange, or red) with black or black yellow even reddish spot. The larvae are dark, with yellowreddish spots and forked thorns. It takes about 1 to 2 weeks from egg to larvae to adult and many generations can be produced in a short time. Adult ladybirds are usually predatorsbut it is their larvaethat attack leaves.Borror*et al.* (1992) and Kalsoven (1981) describe the snout beetle as being hugely variablein size, body shape, snout shapewith a dark, black brown or black colour. The larvaehas a white, strong head, and is arched. Snout beetles are leaf skeletonisers

Extent of damage

The extent of damage in the teak plantation sruveyed was heavy with 64% of the trees being attacked by the snout beetle and 56% of the trees attacked by the lady bug (Table 3).

Table 3. Extent of damage; % of trees attacked by each pest

Pest	Number of trees			% of trees attacked	Category (see Table 1)
	Observed	Attacked	Not attacked		
Snout beetle	125	80	45	64	Heavy
Lady bug	125	70	55	56	Heavy

Damage intensity

The snout beetle caused a greater intensity of leaf damage in all plots than the lady bug. Although more than half the trees were attacked by pests the damage intensity did not go above 40% and the average was 29.4 for the snout beetle and 17.2 for the lady bug.

Table 4. Damage Intensity

Sample Plot	Pest	
	Snout beetle	Lady bug
1	37.7	16.9
2	32.4	21.0
3	27.1	18.0
4	26.1	15.5
5	23.7	14.7
Average	29.4	17.2

In summary a high number of teak trees were infested with the two defoliating species but the intensity of damage was low to medium.The presence of damaging insects in forest area is influenced by many factors; climateinsect food supply(Graham, 1952), competition between insects, and silvicultural practices. Temperatures within the forest ranged between 21.8°C and 26.6 °C at the time the research was carried outRelative humidity was 81%and during thesurveys rain fell heavilySunjay (1970) states that the presence of certain types of pests over others isdefined by topography and climate (temperature, humidity, and speeding also rain fall).

The major pests found by our studies reproduce well at between 23°C and 27°C with relative humidity between 73 and 100% and therefore conditions were ideal for these pests.In addition to favoruable conditions the teak trees at Passo Village were not well maintained with no weeding, fertilisation or pest control. Such trees will be less vigorous and more prone to pest attack. Soemartono (1980) and Untung (1993) both recommend that pest control can be obtained by good silvicultural practices.

Conclusions

1. The two major defoliating pests attackingteakplantations inside the forest conservation area in Passo Village Ambon City Maluku Indonesia were the snout beetle (*Orchidophilus aterrimus)*and lady bug (*Coccinella magnifica).*
2. These two pests were widely present on a large number of trees and were causing low to medium levels of damage.
3. Environmental conditions in the forest were inducive to pests especially as the trees are not well maintained.

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