

Durability of Natural and Cultured Ironwood (*Eusideroxylon zwageri* T Et B) on Subterranean Termite (*Coptotermes curvignathus* Holmgren)

by

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Abstract

Ironwoods (*Eusideroxylon Zwageri* T Et B) from natural forest estimated 70 years old with 36 cm diameter and from plantation 26 years old with 16 cm diameter were tested to subterranean termite in laboratory test regarding to SNI 01.7207-2006. The test results suggest that, percentage weight loss (WL%) below the threshold of SNI-2006, so since young ironwood can already be categorized as wood durability class I, because weight loss value <3.52%.

Key words: Age, *Coptotermes curvignathus* Holmgren, weight loss, resistance of wood

Introduction

Ironwood (*Eusideroxylon Zwageri* T Et B) is still relying on natural regeneration. At least the cultivation of this crop due to the length of the crop production cycle, to reach a diameter of 50 cm it would take at least 100 years if no intensive care (Hastaniah, 1999), considering that the average diameter increment is only 0.5 cm per year. Aulia.A, *et al*,2007, concluded that natural ironwood have a compund chemichal or extractive potencial like alkaloid, flavonoid, triterpeneoid, tannin and saponin.

Ironwood naturally have superior durability compared to other wood species, it is belonged to durability class category I (Martawijaya *et al*. 1982; Sumarni, *et al*, 2002) This study aims to examine and compare the ironwood resistant against subterranean termite attack on timber plantation in 1983 (26 years old) with a diameter of 16 cm compared with the results of natural regeneration of timber estimated 70-year-old with a diameter of 36 cm. Research Lusita *et al* (2007), concluded that ironwood with a diameter > 50 cm free from dry wood termite and subterranean termite attacks. How about the durability of cultured ironwood of a relatively young age with a smaller diameter. The output to be achieved is to identify durability properties of cultured ironwood, so early identification can be an inspiration to improve planting efforts and re-program this type of timber and bulk.

Materials and methods

Materials

Test method refers to the Indonesian National Standard (SNI 01.7207-2006), with force feedback model (method of forced-feeding test). The samples were taken from plantation ironwood tree 26-year-old with a diameter at breast height (dbh) 16 cm (A) and from natural regeneration ironwood about 70 years old with a dbh 36 cm (B). The sample for termite test sized of 2.5 x 2.5 x

0.5 (cm) longitudinal by radial by tangential respectively. The sample was oven dried and weighed to determine weight prior to the test or initial weight, and after the test it was oven dried then dried to determine weight after test.

Methods

- a) Sample inserted into jampot, placed by standing on the basis jampot and dropped up in such a way so that one of the widest field test sample jampot touched the wall; The replication was ten samples for each test.
- b) 200 grams of moist sand was added into jampot that have a water content of 7% below the water holding capacity;
- c) The jampot was inserted with 200 healthy and active worker subterranean termites (*Coptotermes curvignathus* Holmgren, and then the test sample is stored in a dark place for 4 weeks;
- d) Each week, the activity of termites in jampot observed and each jampot was weighed. If the water content of sand fell 2% or more, then into the jampot is added enough water so the water levels reached to standard.

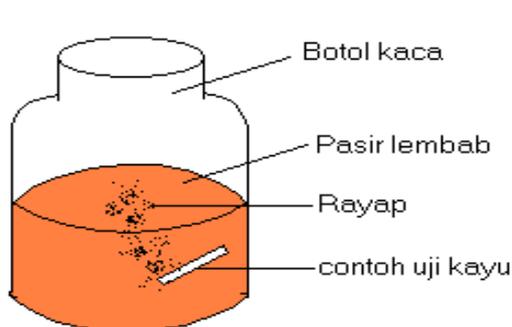


Figure 1. Sample test soil timber against termite attack

- e) The results are stated in weight loss and is calculated using the equation:

$$P = \frac{W_1 - W_2}{W_2} \times 100 \%$$

Remarks

P is weight loss, expressed as (%);

W1 is the weight of dry wood furnace before it is fed (g);

W2 is the weight of dry wood furnace after being fed (g).

- f) Determination of resistance of wood based on Table 1.

Table 1. Classification of wood resistance against subterranean termites by a decrease weight.

Class	Resistance	Weight Loss (%)
I	Highly resistant	< 3.52
II	Resistant	3.52 – 7.50
III	Medium	7.30 – 10.96
IV	Bad	10.96 – 18.94
V	Very poor	18.94 – 31.89

Result and discussion

Weight loss of woods

Table 2. Value of the test sample weight loss percentage

Wood	Weight Loss (%)	Sd	Durability Class	t-test 0.05
Plantation 26-year	1.54	0.36	I	2.093
Natural 70-year	0.45	0.43	I	

t-test indicated that both wood samples was not significantly different or the origin wood affected the percentage of wood weight loss (WL%). Based on ISO 01.7207-2006, WL magnitude average for both samples still below 3.52% and classified into durable first-class category against subterranean termite. This mean that ironwood has a good performance to subterranean termite attack even it is still young age, and it can be supposed that the wood already has an active chemical compounds that are not favored to termite. Additionally ironwood also belong to class I for strength class, so the possibility of termites are unable to attack because of the wood hardness, so that these termite groups died from lack of the feeding. Losing weight happens to the test sample is due to the influence of water content. The concentration of active compound in ironwood into an opportunity for research, deals with the advantages of the nature of the wood from termite attack. **Conclusion**

In general it can be stated that the natural ironwood are proven to have high durability, even for an old ironwood relatively young (26 years) of testing for resistance to termite attack equipment, including the type of wood that is resistant to drywood termite or durability class I.

Suggestion

Very wise to develop this type of timber in bulk, because o the excellen tnatural properties and its utilization can be further optimized.

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