Struktur anatomi batang dan kandungan kimia rotan serta pencegahan serangan bubuk dinoderus minutus fakir pada beberapa jenis rotan

Jasni, author

Abstrak

ABSTRAK
Indonesia memiliki jumlah jenis dan potensi produksi rotan yang tertinggi di dunia. Namun, pemanfaatannya masih sangat terbatas pada sejumlah jenis tertentu saja. Keterbatasan ini disebabkan karena kurangnya informasi mengenai sifat-sifat dasar rotan. Oleh karena itu, penelitian ini bertujuan untuk mengetahui sifat-sifat dasar rotan yang meliputi; struktur anatomi, kandungan kimia, keawetan dan keterawetan tiga jenis rotan. Jenis rotan yang diteliti ialah rotan sampang (Korthalsia junghunii Miq), rotan bubuay (Plectocomia elongala Bl) dan rotan seuti (Calamus ornatus BI) yang diambil dan Taman Nasional Gunung Halimun.

Hasil penelitian menunjukkan bahwa pada bagian kulit batang rotan ditemukan lapisan epidermis dan endodermis. Yellow caps hanya ditemukan pada ratan sampang dan rotan bubuay. Diameter ikatan pembuluh ketiga jenis rotan tidak berbeda nyata (P>O.05). Begitu juga dengan diameter metaxylem dan diameter phloemnya. Tetapi diameter protoxylem ketiga jenis rotan berbeda nyata (P<O.05). Kandungan holoselulosa, a-selulosa dan tanin tidak berbeda pads ketiga jenis ratan yang diteliti. Namun, kandungan lignin dan pati berbeda pada ketiga jenis rotan. Kandungan lignin tertinggi terdapat pada jenis rotan sampang, kemudian bubuay, dan seuti. Sedangkan kandungan pati tertinggi dijumpai pada rotan bubuay, kemudian seuti, dan terendah sampang. Hasil penelitian mengenai keawetan dan keterawetan rotan, menunjukkan bahwa derajat serangan tertinggi terlihat pada rotan bubuay, kemudian seuti, dan terendah sampang. Persentase kematian bubuk yang tertinggi dijumpai pada rotan sampang, kemudian seuti, dan terendah bubuay. Kehilangan berat rotan yang tertinggi akibat serangan bubuk terdapat pada rotan bubuay, kemudian seuti, dan terendah sampang. Pemberian permetrin pada ketiga jenis rotan dapat menurunkan derajat serangan dan meningkatkan persentase kematian bubuk, serta mengurangi kehilangan berat rotan. Semakin tinggi konsentrasi permetrin, maka semakin besar pula pengaruhnya.

Berdasarkan hasil penelitian yang dilakukan dapatlah disimpulkan, bahwa rotan sampang, yang saat ini termasuk jenis tidak komersial, merupakan jenis rotan yang memiliki keawetan dan kekuatan yang tinggi, karena dinding sel serabutnya tebal, diameter rongga protoxylem yang kecil, serta mengandung lignin tinggi dan pati yang rendah. Dalam upaya pengawetan dengan permetrin seyogyanya menggunakan konsentrasi minimal 0.09 ppm.
<hr><i>ABSTRACT
Despite large number of rattan species found in Indonesia, the number of species used for commercial purposes are very limited. There is no doubt that this is partly due to limited information on basic, both physical and chemical, properties of less-or non commercial species. It is known that the basic properties of rattan species contribute to their physical strength and also to their natural resistance against insect attacks.

To provide this basic information, a study of anatomical features and chemical contents of rattan species is, therefore, a necessity. In this research, three species of rattan, i.e. sampang (Korthalsia junghunii Miq.), bubuay (Plectocomia elongata Bl.), and seuti (Calamus ornatus Bl.), collected from Gunung Halimun National Park, West Java, were used for the study. The two former species are non-commercial species and the latter represents a commercial species, as a comparison.

Anatomical features of rattan stems were observed under a light microscope. Microtome and maceration techniques were used in preparing the samples. Chemical contents of the rattan stems were analyzed by SII procedures. The resistance of rattan species and the effectiveness of permethrin solutions (0.01, 0.03, and 0.09 ppm) as preservatives against the powder post beetle (Dinoderus mirzutus Fabr.) were also conducted in the laboratory. Five dried stems of each rattan species (2 cm length) were soaked in each concentration for two hours. The sterns were left in a dry room for 30 days. They were also steamed (ca. 20 minutes) and dipped into 3 % of CaOCI2.4H20 solution as they would be used for making furniture. Ten adult beetles were introduced into individually treated stems which was covered with a glass tube. The same procedure was applied to the control, but without adding the preservative. A fifteen days experiment was carried out to find out the stem weight loss and the degree of beetle attacks. The number of insect death was also counted for each treatment during the experiment.

Anatomical features of rattan stems showed that Yellow caps on epidermis layers were only found in sampang and bubuay. The shapes of vascular bundles in sampang, bubuay, and seuti were rhomboidal, rounded, and oval, respectively. There were no significant differences ($P>0.05$) in the diameter of vascular bundles among the three species observed. A significantly longer fiber sheath ($P<0.05$) was found in bubuay. The diameter of lumen of bubuay was also significantly bigger ($P<0,05$) than two other species. However, sampang had a significantly thicker fiber cell wall ($P<O.05$).

The result also revealed that sampang and seuti had one metaxylem, whereas two or sometimes one metaxylem was found in bubuay. The diameter of metaxylem and phloem did not differ significantly ($P>0.05$) among the three rattan species. A significantly bigger diameter of protoxylem ($P<0.05$), however, was observed in seuti.

Chemical analyses of the rattan stems showed that the three species contained a nearly similar amount of holocellulose, a-cellolose, tannin, and starch. The higherst lignin content was found in sampang, followed by bubuay and seuti. This difference probably makes sampang stems stronger than bubuay and seuti.

Higher degree of resistance against powder beetles was shown by sampang. Its stems significantly received lower degree of attack ($P<0.05$) and lower weight loss ($P<0.05$) than two other species tested A significantly higher percentage mortality of beetle ($P<0.05$) was also observed in sampang. High lignin content may be responsible for the sampang resistance. The higher mortality of beetles in sampang may be due to its lower content of starch It was clearly shown, from the experiment, that the starch content tended to correlate negatively with the beetle mortality. Low starch contents in the stems resulted in high beetle mortality.

Permethrin was not only toxic to powder post beetle, but it also reduced the beetle attacks. All rattan stems

were prevented from further damage by permethrin treatments. Increasing the permethrin concentration significantly reduced the degree of beetle attack and the stem weigth loss, and increased the beetle mortality ($P<0.05$). Total mortalities of beetles were found on stems treated with 0.09 ppm of permethrin solution.

From the result it can be concluded that sampang, categorired as non-commercial species, anatomically seems to be the strongest among the three rattan species studied, followed in order by seuti and bubuay. Sampang is also naturally more resistant againts the powder post beetle than two other species. It is recommended to treat the rattan stems with at least 0.09 ppm of permethrin solution to give a full protection from powder post beetle attacks.</i>