



BRILL

OCCURRENCES OF MILD COMPRESSION WOOD IN *AGATHIS BORNEENSIS* AND *DACRYDIUM ELATUM*

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ABSTRACT

Studies on the compression wood in tropical gymnosperms are uncommon due to their limited distribution and over-exploitation. Microscopic examination of the heartwood of two tropical gymnosperms, *Agathis borneensis* (local name: bindang, damar minyak) and *Dacrydium elatum* (local name: sempilor) growing on higher elevations in Sarawak, Malaysia showed the occurrence of mild compression wood. Intercellular spaces were present in the compression wood of *A. borneensis*, but not in *D. elatum*. Rounded shapes of tracheids, typical of severe compression wood, were not observed in any of the samples examined. In *D. elatum* helical cavities were present, which corresponded in location to cell wall checks seen in cross-sectional views. The S₁ layer was relatively thick in both wood species but a distinct S₃ layer was observable only in the mild compression wood of *D. elatum*. Although the main feature of the mild compression wood tracheids of both wood species was greater lignification of the outer S₂ region, autofluorescence and KMnO₄ staining showed the fluorescence and staining intensity in the corner middle lamella in some cases to be much stronger than that in the outer part of S₂ layer.

Keywords: Tropical gymnosperms, helical cavities, intercellular spaces, cell wall ultrastructure, lignin concentration.

[In the online version of this paper Figure 1, 2, 3, and 6 are reproduced in colour.]

INTRODUCTION

Compression wood anatomy has mainly been investigated in conifers growing in the temperate zones where compression wood is known to occur in all coniferous species as well as *Ginkgo* (Timell 1978, 1986; Yoshizawa & Idei 1987). In contrast, studies on the wood anatomy of compression wood in the tropical gymnosperms are rare. This may be because native conifer species in many tropical countries are not easily available due to their restricted distribution, usually at cooler elevations (Lemmens *et al.* 1995), and over-exploitation of tropical gymnosperms, such as the genus *Agathis* (Whitmore 1977).