

Determination of the combined effect of chemical modification and compression of agathis wood on the dimension stability, termite resistance, and morphological structure

ABSTRACT

Agathis wood (*Agathis lorantifolia* Salisb.) was impregnated with a combination of styrene and methyl methacrylate and compressed to a strain of 50% to improve dimensional stability and termite resistance. The changes in cell structure were analyzed to determine the effects of the combination treatment. The results showed that densification of agathis wood with compression, impregnation, and a combination of treatments resulted in an increase in physical properties (density and dimensional stability) by changing the cellular structure and chemical components (i.e., cellulose crystallinity, microfibril angle, and preferred orientation of fibers) as well as degradation of cellulose. The chemical modification and combination treatment (chemical and compression) of wood generally led to a high resistance to dry wood termites.

Keyword: *Agathis lorantifolia*; Wood compressed; Wood impregnated; Wood compressed; Dimensional stability; Microfibril angle; Termite resistance