

Durability of Cement Bonded Particleboards Produced from *Terminalia superba* and *Gmelina arborea* against Subterranean Termite Attack

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Abstract : This study was conducted to determine the durability of wood-cement particleboards when exposed to attack by subterranean termites, *Macrotermes subhylinus*. The boards were made from *Terminalia superba* and *Gmelina arborea* wood sawdust at nominal board densities (BD) of 1000, 900, and 800 kg/m³ using wood-cement mixing ratios (MR) of 3:1, 2.5:1, 2:1, and 1:1. Above ground durability tests against termite attack were carried out according to ASTM D 2017 for 14 weeks. Results of visual assessment of the wood cement particleboards show that all the board samples had a visual rating that was not less than 7 (i.e., moderate attack) for both species irrespective of the MR and BD. *T. superba* boards were found to have higher resistance to termite attack compared to their *G. arborea* counterparts. The mean values for weight loss following exposure ranged from 1.93 to 6.13% and 3.24 to 12.44%. Analysis of variance (ANOVA) results of the weight loss assessment revealed a significant ($p < 0.05$) effect of species and mixing ratio on the weight loss of the boards due to termite attack with $F_{(1,72)} = 92.890$ and $P = 0.000$ and $F_{(3,72)} = 8.318$ and $p = 0.000$, while board density did not have any significant effect ($p > 0.05$) with $F_{(2,72)} = 1.307$ and $p = 0.277$. Thus, boards made from a higher mixing ratio had better resistance against termite attacks. Thus, it can be concluded that the durability of cement-bonded particleboards when exposed to subterranean termite attack is not only dependent on the quality of the wood raw material (species) but also on the enhanced protection imparted by the cement matrix; the protection increased with increase in cement/wood mixing ratio.

Keywords : cement-bonded particleboard, mixing ratio, board density, *Gmelina arborea*, *Terminalia superba*

Conference Title : ICWEFM 2021 : International Conference on Wood Energy and Forest Management

Conference Location : Dubai, United Arab Emirates

Conference Dates : August 16-17, 2021