

## NON-DESTRUCTIVE EVALUATION OF SELECTED PLANTATION SPECIES

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Non-destructive evaluation (NDE) of wood strength is getting great attention. By using NDE, *in-situ* wood strength can be determined without much sample preparation and more importantly without destroying the sample. This study attempted to employ NDE in wood by means of free-free flexural vibration. The dynamic moduli of elasticity were determined on (a) *Hevea brasiliensis*, (b) *Acacia mangium* and (c) *Paraserianthes moluccana*. Samples of size 10 (R) × 20 (T) × 340 mm (L) were prepared from tension and opposite wood of the intended species. For tension wood, the results of (a), (b) and (c) were 12.21, 14.45 and 6.71 GPa respectively. The results for opposite wood of (a), (b) and (c) were 11.84, 13.10 and 7.31 GPa respectively. Destructive tests were done on the same samples where modulus of elasticity (MOE) and modulus of rupture (MOR) were determined using three-point bending. For species (a), the MOE values of tension and opposite wood were 10.76 and 9.42 GPa and the MOR values were 52.89 and 44.19 MPa respectively. For species (b), the MOE values were 12.64 and 11.52 GPa in tension and opposite wood respectively. For MOR, the results in tension and opposite wood were 110 and 96.98 MPa respectively. For species (c), the results for MOE values in tension and opposite wood were 5.68 and 6.53 GPa and those for MOR values were 34.69 and 41.02 MPa respectively.

### INTRODUCTION

Dynamic methods or non-destructive evaluation (NDE) methods are valuable techniques in determining the end-uses of wood. These methods involve wide techniques such as vibration, acoustic, stress