

DIMENSIONAL VARIATIONS OF NORMAL AND TENSION WOOD FIBRES IN FOUR CLONES OF *HEVEA BRASILIENSIS*

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Variations in the length, width and wall thickness of normal wood fibres (NF) and tension wood fibres (GF) were studied at different height levels of four clones viz. Tjir 1, GT 1, RRIM 600 and RRH 105 of *Hevea brasiliensis*. Length and width of both types of fibres showed a fluctuating trend from pith to periphery. In all these clones the average length of NF was more than that of GF. The variation in length and width of NF and GF between clones and different height levels was not statistically significant. However, highly significant variations were observed in length, width and wall thickness of normal and tension wood fibres within all the four clones.

Keywords: Fibre wall, G-fibre, *Hevea brasiliensis*, Tension wood, Wood fibre.

INTRODUCTION

Hevea brasiliensis (Para rubber) belonging to the family of Euphorbiaceae, is a major source of natural rubber and timber. The occurrence of tension wood is a natural defect, which adversely affects the strength properties of rubber wood to a great extent. In tension wood fibres, certain layers of the secondary wall are not lignified or only partially lignified. Such fibres are composed of crystalline cellulosic microfibrils. This gives the characteristic 'gelatinous' or sticky nature to tension wood fibres and hence are generally designated as gelatinous fibre or G-fibre. Generally tension wood is considered as the abnormal tissue produced by the cambium in tune with the reorientation of the axis from its normal equilibrium position (Wardrop, 1964; Cole *et al.*, 1969; Fisher and Stevenson, 1981). The wood

fibre during tension wood formation undergoes modifications with respect to structural and mechanical properties. Therefore all the modifications that have occurred in wood fibres must be considered to explain the behavior of tension wood and its derivatives (Kaeiser and Boyce, 1965). The thickness of G-layer is variable and normally it replaces the innermost (third) layer of the secondary cell wall (S_3 layer) in *H. brasiliensis*. In other species, it may replace the secondary S_2 layer or may get incorporated with S_3 layer (Wardrop and Dadswell, 1955; Cole *et al.*, 1969; Scurfield, 1973).

In many hardwood species, tension wood fibres are longer than normal wood fibres (Chow, 1946; Onaka, 1949; Kaeiser and Boyce, 1965). Jourez *et al.* (2001) reported that G-fibres are more than 4.5% longer than normal wood fibres in poplar.