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ANATOMICAL AND FIBRE CHARACTERISTICS OF SOME AGRO WASTE MATERIALS FOR PULP AND PAPER MAKING

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ABSTRACT

The present investigations were carried out to see the potential use of stalks of selected species of agro waste materials as an alternative source for pulp and paper making by studying their anatomical characteristics, fibre morphology and their derived indices. Anatomically, fibres were thin walled, rectangular and hexagonal in cross section. The percentage of fibres was greater than other xylem elements and varied from 38% (S. edule) to 46% (C. annum var. accuminatum and S. melongena). The fibre morphology of selected species showed that mean fibre length, fibre diameter, lumen diameter and fibre wall thickness varied from 522.08±61.96µm (G. max) to 1285.80±270.29µm (C. sativus), 18.87±3.56µm (G. max) to 30.16±5.69µm (S. edule), 15.25±3.50µm (C. annum var. accuminatum) to 25.09±5.58µm (S. edule) and 2.52±0.31µm (S. lycopersicum) to 2.81±0.57µm (S. melongena) respectively. The derived indices like Runkel ratio, Slenderness ratio, Flexibility coefficient, Luce's shape factor, Solid factor and Rigidity coefficient of selected species were comparable to Pinus kesiya and Bambusa tulda. The results indicated that though all selected species have potential to be used in pulp and paper making in one way or the other but C. annuum var. accuminatum, C. annum var. grossum, C. sativus and S. edule had the most desirable fibre characteristics and their derived indices.

KEYWORDS: Fibre Dimensions, Derived Indices, Pulp and Paper, Anatomical Characteristics, Agro Waste Materials

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