Wood Property Variation in Selected Clones of *Casuarina equisetifolia* for Pulp and Paper Making

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Abstract

Variation in wood physical (specific gravity), anatomical (fibre, vessel and ray morphology) and chemical (cellulose and lignin per cent) properties of 46 clones of *Casuarina equisetifolia* L. was studied to assess their suitability for pulp and paper making. These clones were sampled from a 3 year-old clonal trial in Karur District, Tamil Nadu, India. Transverse discs from each clone were collected from the base of billets and converted to smaller specimens for undertaking the studies. Specific gravity was determined using a precision balance and fibre morphology was studied using an image analysyind system. Cellulose and lignin were estimated using standard procedures. Nested analysis of variance was carried out to find out inter and intra-clonal variation of clones. All the physical and anatomical properties except fibre lumen width, runkel ratio, rigidity coefficient, flexibility coefficient and shape factor, showed significant differences between the clones. Within clone variation was also significant for all the physical and anatomical parameters except specific gravity (oven-dry). In order to assess the suitability of clones for pulp and paper making, specific gravity (oven-dry), fibre length, Runkel ratio, shape factor, slenderness ratio, flexibility coefficient, rigidity coefficient, and cellulose and lignin content were considered. Among these, fibre length, slenderness ratio, flexibility coefficient, shape factor and cellulose and lignin content of clones were found to be within the acceptable range for pulp and paper making. For selecting the best clones suitable for pulp and paper making, clones were grouped to four clusters by carrying out hierarchical cluster analysis on the basis of all physical, anatomical, chemical and growth parameters. Cluster 4 (one clone) and cluster 2 (11 clones) were found to be better for pulp and paper making in comparison to other clusters.