WOOD DENSITY VARIATION OF SOME MANGROVE TREE SPECIES IN NIGER DELTA AREAS OF NIGERIA

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ABSTRACT

Samples of wood of three mangrove tree *species (Rhizophora racemosa, R.harrisonni* and *Avicennia Africana)* were collected from three different mangrove reserves:- Olague Forest Resrves latitude 5^{o} $45^{'}$ North and longtitude 5^{o} 10 East in Delta State, Apoi Creek Forest Reserve, Latitude 4^{O} North and Longitude 40^{o} East in Rivers State and Stubbs Creek Forest Reserve Latitude 4^{o} 30' Longitude 8^{o} North and 7 East in Akwa Ibom State, Nigeria. Wood specimens were machined to 5mm in thickness, and were conditioned to 12% moisture content. Radiographs of conditioned specimens were prepared by exposure techniques similar to those developed by Varem-Sanders and Campbell, (1996) (50KV X-ray, specimens at 2.5m from sources, peak KV 15-20 milliamps for about 4 minutes with Kodak Industrial C films). Films of wood specimen were scanned with Joyce Loble microdensitometer, which recorded the variation in density in a line from the pith outwards. Extraction of extractives was done with Soxhlet condenser with a solvent of one part ethyl alcohol and two parts benzene by refluxing in a soxhelt condenser for 24 hours. The cores were dried in a vacuum oven, reconditioned and radio graphed. Density was determined at 200 micron intervals along both radii of each core. The wood of the mangrove species had high density (1.04gm/cm^{3}) which also varied considerably between and within species. Removal of extractives from wood reduced its density. The density of extracted wood was determined from that of unextracted wood in the mangrove tree species. Extractives can account for between 1 to 20% of the oven-dry weight of wood of various tree species and can influence wood density values appreciably. Removing these chemical deposits (extraction) in wood samples can help establish a consistent baseline for comparing wood densities where extractives are expected to differ between sample parameters. Although western hemlock is a very important timber species in the Pacific Northwest, laboratories that determine wood density may or may not remove extractives prior to density assessment. Wood density values were compared before and after extraction for 19 young-growth western hemlock samples. Extraction was performed using 95% ethyl alcohol-toluene solutions. Ring density values averaged 0.045 g/cm^{3} lower for extracted samples compared to unextracted samples across rings. Slightly higher amounts of extractives were found at rings near the pith; however, a general consistency in extractive content existed among samples and along the radial (age) profile. This means that the density of these species can be reduced through silvicultural practices to reduce extractive content thereby reducing density. This also means that there is the possibility of improving by selection of trees with desired density (reduction of density) to make the wood suitable for the manufacture of furniture, plywood and particle board.

Keywords: Wood Density, Variation, Mangrove species, and Extractive content