

Determination of Selected Engineering Properties of Giant Palm Seeds (*Borassus Aethiopum*) in Relation to Its Oil Potential

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Abstract : The engineering properties of giant palms are crucial for the reasonable design of the processing and handling systems. The research was conducted to investigate some engineering properties of giant palm seeds in relation to their oil potential. The ripe giant palm fruit was sourced from some parts of Zaria in Kaduna State and Ado Ekiti in Ekiti State, Nigeria. The mesocarps of the fruits collected were removed to obtain the nuts, while the collected nuts were dried under ambient conditions for several days. The actual moisture content of the nuts at the time of the experiment was determined using KT100S Moisture Meter, with moisture content ranged 17.9% to 19.15%. The physical properties determined are axial dimension, geometric mean diameter, arithmetic mean diameter, sphericity, true and bulk densities, porosity, angles of repose, and coefficients of friction. The nuts were measured using a vernier caliper for physical assessment of their sizes. The axial dimensions of 100 nuts were taken and the result shows that the size ranges from 7.30 to 9.32cm for major diameter, 7.2 to 8.9 cm for intermediate diameter, and 4.2 to 6.33 for minor diameter. The mechanical properties determined were compressive force, compressive stress, and deformation both at peak and break using Instron hydraulic universal tensile testing machine. The work also revealed that giant palm seed can be classified as an oil-bearing seed. The seed gave 18% using the solvent extraction method. The results obtained from the study will help in solving the problem of equipment design, handling, and further processing of the seeds.

Keywords : giant palm seeds, engineering properties, oil potential, moisture content, and giant palm fruit

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