

Potential of cassava root as a raw material for bio composite development

Abstract

In recent years, a lot of researches have done by domestic and foreign scholars to enhance and improve the development of man-made board production that based on natural fiber and agricultural residues. Due to a worldwide shortage of forest resources which have been excessive cutting, man-made board production has become one of the alternative ways to solve wood supply problems. Particle board is a panel product manufactured under pressure from particles of wood or other ligno-cellulosic materials and an adhesive. In Malaysia, the demand and trend of uses wood panel product such as particle board is increasing in the market. The purpose of this study is to identify the potential use of cassava root as a raw material for bio-composite development. In this research, cassava root from different ages (6, 9 and 12 months) were used for production of bonded particle boards by using polyester as a binder. Constant resin content, temperature, time pressing and pressure were applied during boards' production. Moisture content, density, water absorption and thickness swelling test were carried out to determine dimensional stability of the boards while static bending tests were carried out to assess the mechanical strength of the boards. Particleboard from 12 month cassava root gave the best results in term of physical and mechanical properties. But, particleboard from 12 month cassava root did not meet the ANSI/A208.1-1999 standard for general-purpose boards. For this reason, additional research needs to be done on improving the physical and mechanical properties produced from different ages of the cassava root.

Keywords; Bio-composites; Cassava root; Composite wood product; Mechanical properties