



ISPO RESEARCH REPORT

BIOJELAS: Bioplastic made from taro tuber starch (*Colocasia esculenta* (L.) *Schott*) and Sweet Orange Peel Pectin (*Citrus sinensis* L.)

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Environmentally Friendly Plastic Alternatives (Subtheme: Chemistry)

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ABSTRACT

Pollution from conventional plastics which are difficult to decompose has encouraged the development of bioplastics as an environmentally friendly alternative. This research aims to create and test the characteristics of bioplastics made from taro tuber starch (*Colocasia esculenta*) and sweet orange peel pectin (*Citrus sinensis*). Starch extraction is carried out using a separation method using water, while pectin is obtained through acid extraction with heating. Bioplastics are made by mixing starch, pectin, glycerin as a plasticizer, and water, then heating them until they thicken before being molded and dried. Mechanical properties testing includes tensile and elongation tests, while physical properties are tested through water absorption. The research results show that the resulting bioplastic has a flexible texture with good water absorption capacity, causing rapid degradation when soaked. This bioplastic degrades within 3 to 6 weeks, depending on environmental factors such as humidity, temperature and microbial activity. Tensile test produces an average tensile strength value of 0.1275 MPa, with elongation ranging from 6.3–7 cm from an initial length of 3.5 cm. With its easily biodegradable nature, bioplastic has properties that are weak against environmental stress and forces that encourage further development to perfect pectin and taro starch bioplastics.

Keywords: Bioplastics, taro starch, orange peel pectin, mechanical properties, environmentally friendly.