

**WILD TARO (*COLOCASIA ESCULENTA*) STARCH-BASED BIOPLASTICS
FOR VARIOUS APPLICATIONS**

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The plastic industry relies strongly on the use of petroleum-derived materials. However, the low degradability of these materials is a major environmental concern. Starch is a natural polymer, and starch-based bioplastic materials are more environmentally friendly as they degrade faster than conventional plastic materials. Therefore, starch-based bioplastics as substitutes for petroleum-derived materials have attracted the attention of many researchers. Literature shows that most researchers have used corn, potato, cassava etc., as starch sources for bioplastics. However, less work is reported on the utilization of wild taro (*Colocasia esculenta*) as a source of starch. Wild taro contains a high amount of starch (70-80%) by mass and is abundantly available in Sri Lanka. This study aimed to produce, characterize, and investigate the possible applications of wild taro starch-based bioplastics. The major applications tested during this study were food packaging, the production of grow bags for young plants and ornamentation using thin sheets. Glycerol and gelatin were used as plasticizers during the production of bioplastics. The bioplastic samples were prepared with various amounts of plasticizers and thicknesses. Properties such as density, solubility, biodegradability, sealing properties, morphology, chemical resistance, wettability, and tensile strength were tested for the prepared samples. The density and water solubility of the sample was calculated to be 10.9 g cm⁻³ and 27.9%, respectively. The wettability of the surface was tested by measuring the contact angle between the surface and the water. The surface is less hydrophilic with contact angles in the range of 70°- 80°. The measured tensile strength and Young's modulus were 0.04 MPa and 3.70×10⁴ N m⁻², respectively. The overall results showed that wild taro starch-based bioplastics are suitable for packaging, ornamentation, and producing grow bags.

Keywords: Bioplastic, Degradation, Plasticizers, Starch