The fabrication of yam bean (pachyrizous erosus) starch based bioplastics

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Abstrak

Bioplastics, easily degraded plastics made from renewable biopolymers such as starch and protein, are being studied as possible substitute for synthetic plastics. One of Indonesian natural resources, Jicama (Pachyrizous erosus), also known as yam bean, is believed to have the potential to be made as bioplastics. This study aims to develop starch-based biofilms made from Jicama. The films were fabricated by using the solution casting method, with varying contents of water (67–93 wt%) and sodium hydroxide (0.3–0.7 g). Examinations were carried out by means of visual inspection, tensile test, scanning electron microscopy and FTIR spectroscopy. A continuous bioplastic film was successfully made with 93 wt.% water. The addition of water increased film formability. Sodium hydroxide improved the film formability but, also, induced fragility. The highest tensile strength and stiffness of 11.5 MPa and 0.98 GPa, respectively were achieved from the film prepared with 93 wt% water. These values are comparable to LDPE but with a lower ductility.