

ABSTRACT

Shaula Dzikra Maulidya, 24020222140078. **Exploration and Analysis of Amylase-Sensitive Starch from Plants in KHDTK Wanadipa Undip under Variations of Substrate Concentration, Temperature, and Incubation Time.** Under the guidance of Sri Pujiyanto and Siti Roswiyah Yulyani.

Amylase-sensitive starch is a starch fraction that is readily hydrolyzed by α -amylase and is therefore classified as Rapidly Digestible Starch (RDS), which can be rapidly converted into glucose. This characteristic makes amylase-sensitive starch a potential rapid energy source for the body, particularly for the development of sports nutrition products. Although Indonesia possesses a wide diversity of local starch sources, the characteristics of amylase-sensitive starch derived from local plants, especially those originating from the Wanadipa Forest Area for Special Purposes (KHDTK Wanadipa), Diponegoro University, remain largely unexplored. This study aimed to explore and analyze amylase-sensitive starch from local plants to identify the most promising starch candidate based on variations in temperature, incubation time, and substrate concentration. Four local starch sources were investigated: waxy cassava (*Manihot esculenta* Crantz), purple sweet potato (*Ipomoea batatas*), tannia (*Xanthosoma sagittifolium* (L.) Schott), and dent corn (*Zea mays*). Starch was extracted and subjected to a preliminary hydrolysis assay using α -amylase to select the best candidate starch. Further hydrolysis experiments were then conducted using substrate concentrations of 0.5–2.5% (w/v), incubation temperatures of 30–50°C, and incubation times of 5–25 minutes. Glucose content was determined using the DNS method and measured colorimetrically at 540 nm. The results showed that waxy cassava was the most promising amylase-sensitive starch, producing the highest glucose content 1.66 mg, hydrolysis percentage (8,29%), and RDS value (5,71%). The optimum hydrolysis conditions were obtained at 35°C with a hydrolysis percentage of (20,36%), a substrate concentration of 0.5% (w/v) with a hydrolysis percentage of (29,80%), and an incubation time of 25 minutes with a hydrolysis percentage of (7,61%).

Keywords: Plant starch, Amylase, Starch hydrolysis, Substrate concentration, Temperature, Incubation time