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Drying effect on the properties of traditionally processed sago starch

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Abstract

Local people in Sarawak, Malaysia produce sago starch, commonly referred as *lemantak*, using traditional method for authentic meals and delicacies. The quality of *lemantak* degrades with time due to its high moisture content limiting the potential for a wider market, and hence affecting the socio-economy of those whose livelihood depends on sago starch production. The objective of the present work was to evaluate the changes in the properties of traditionally processed dried Sarawak sago starch. In order to achieve this, sago starch was extracted using a well-established traditional process and was dried at 40°C to produce sago starch with moisture contents of 40%, 30%, 20% and 10% wet basis. The effect of moisture content on the physical properties was studied through colour analysis, microscopic analysis, and particle size distribution. Analysis on resistant starch content was also performed. Changes on the hydration and functional properties was monitored by measuring the water absorption index (WAI), water solubility index (WSI), swelling capacity (SC), and gelatinisation behaviour. Lastly, Fourier transform-infrared spectroscopy (FT-IR) was applied to observe the changes in amorphous and crystalline areas. The physical properties analysis showed changes in starch colour and granule surface; but the change on granule size varied. Dried starch with lower moisture content exhibited higher resistant starch, absorption index, and peak temperature, but lower solubility index, swelling capacity, peak viscosity, crystalline index, and amorphous index. It is suggested that moisture content affected the changes in traditionally processed sago starch properties which was influenced by few components namely polyphenol, lipid, amylose-lipid complex, and inter-molecular hydrogen bond.

Introduction

Sago starch has various applications from local meals and delicacies, foods, glue, and cosmetic industries, to the production of bio-degradable plastic, alcohol, ethanol, and acid citric. Malaysia is one of the top leading countries producing and exporting sago starch worldwide; with Sarawak being the largest contributor to this market (Ahmad, 2014). In Sarawak, sago starch is processed commercially by modern factories, and traditionally by small-medium enterprises owned by the locals. Traditionally produced sago starch, commonly referred as *lemantak*, has high moisture content (up to 38.8% w.b.), which is higher than commercial standards. Nevertheless, it still has high demand among the locals due to its suitability for preparing various traditional meals and delicacies (Mustafa Kamal *et al*., 2017a). The maximum standard for moisture content for industrial sago starch is 15% w.b. as stated in the Malaysia Standard of 'Requirements for Industrial Sago Starch' (MS468:1976) while maximum moisture content for edible sago starch is 13% w.b. as stated in the 'Requirements for Edible Sago Starch' (MS470:1992). The demand for traditionally processed sago starch despite its high moisture content creates interest to understand the relation between moisture content and other

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