

**FINAL REPORT
EXPLORATORY RESEARCH GRANT SCHEME
(ERGS/1/2012/STG01/UMS/02/1)**

**A NOVEL METHOD TO PREPARE SAGO
STARCH WITH LOW ENZYME
DIGESTIBILITY**

**LEE JAU SHYA
2015**



UMS
UNIVERSITI MALAYSIA SABAH

Abstract

This study investigated the effect of dual modifications on the physicochemical properties and digestibility of sago starch. Sago starch was subjected to acid methanol treatment or pullulanase debranching prior to physical modifications (heat moisture treatment and annealing). Debranched-annealed and debranched-heat moisture treated starches showed increment in gelatinization temperatures (T_o , T_p , T_c). Combination between acid methanol treatment and heat moisture treatment as well as acid methanol treatment coupled with annealing both increased the gelatinization temperatures of the starches which reflected greater change in the crystalline stability. Combination of heat moisture treatment (HMT) or annealing with debranching treatment both increased the granule stability and contributed to reduction of swelling power and solubility. In contrast, acid methanol treatment coupled with HMT and combination of acid methanol treatment with annealing both lowered the swelling power but significantly increased the solubility. Agglomeration of starch granules were observed in starch treated with acid methanol treatment and heat moisture treatment as well as acid methanol treatment with annealing. Rough surface and surface corrosion were found in all four types of dual modified starches. Combination of debranching with heat moisture treatment, debranching with annealing and also acid methanol coupled with heat moisture treatment all showed increment in RDS content but reduction of SDS and RS content were observed. Conversely, for combination of acid methanol treatment with annealing, especially the least hydrolysed starch had the lowest RDS and SDS content but the highest RS content as compared to native starch. Combination of acid methanol treatment with annealing managed to enhance the indigestibility of sago starch by increasing the RS content of sago starch from 43.0% to 56.6%.