

Extraction and characterization of cassava starch cultivated in different locations in Sabah, Malaysia

ABSTRACT

This work aimed to determine the physicochemical and functional properties of starch cassava grown in two different locations in Sabah, namely Tawau and Semporna. In this study, the starch of the cassava was extracted using a wet method and analysed for its physicochemical and functional properties. The total starch content of cassava grown in Semporna showed a higher value (61.21 g/100 g) compared to the sample from Tawau (51.77 g/100 g). No significant difference ($p>0.05$) observed for starch yield extracted from these two locations. However, there was a significant difference ($p<0.05$) showed for total starch, resistant starch and amylose content. The amylose content of starch isolated from Semporna (23.16%) was higher than from Tawau (13.87%). Scanning electron microscope revealed that starch isolated from both locations had smooth surfaces with some granules spherical, elongated and irregular in shape. Cassava starch from Semporna exhibited a high value of swelling power (6.85%) compared to Tawau (4.07%), and they were significantly different ($p<0.05$). The solubility values of the starch samples from Tawau and Semporna were 28.48% and 24.34%, respectively. The pH was observed to be lower for cassava starch isolated from Tawau (4.80) than for starch obtained from Semporna (5.49). The water absorption capacity of starch from Semporna absorbed slightly more water than starch from Tawau, with values of 76.51% and 63.64%, respectively. Pasting properties results showed no significance for all profiles measured except for setback viscosity. No significant differences ($p>0.05$) were observed for all gelatinisation and retrogradation properties. This study suggests that location influenced the physical, chemical and functional properties of cassava's starch.