

Physicochemical and Functional Properties of Starch from Ackee (*Blighia sapida*) Seeds

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Abstract: *Seeds of the ackee fruit are high in starch content and are a major waste product of the ackee aril canning industry. The objective of this study was to investigate the physicochemical and functional properties of isolated ackee seed starch. De-hulled seeds were dried and milled into 'flour' which was defatted by Soxhlet extraction using petroleum ether. Starch extraction was carried out using 0.2% w/v NaOH solution (24°C, 6 h) and the starch residue soaked in aqueous NaOH (0.05% w/v) for 12 h to remove soluble impurities and then subjected to a bleaching treatment (HCl, 0.01 N). Solubility, swelling power, water absorption, oil absorption and extent of syneresis of the starch were measured and hypoglycin content was determined by reversed phase HPLC. Pasting, thermal properties, crystalline pattern, granule morphology and gel texture were determined, and the gelatinised starch used to prepare retrograded resistant starch. Ackee seed starch comprised small granules which exhibit a C-type diffraction pattern. The starch showed restricted swelling, moderate peak viscosity, and low breakdown compared with commercial corn and potato starches, while the water absorption and oil absorption values were similar to the commercial starches. Ackee starch had a high setback, high syneresis, produced opaque pastes and formed a hard gel texture. Apparent amylose content and the content of retrograded starch were high. Based on the properties, the starch may be suitable in manufacturing of noodles and to produce retrograded resistant starch and may have applications in fat replacers, dusting/face powders and bioplastics.*

Keywords: *Ackee seed, starch, properties, physicochemical, functional*