

Physicochemical Characterization of Starch From Mango Seed Kernel Extracted Using Different Methods

Abstract

Mango seeds are by-products of mangoes that are high in nutrients, but they are usually discarded as waste. The objective of this study is to investigate the physicochemical characterizations of starch from mango seeds extracted using different extraction strategies. In this research, starch from Chokanan mango seed kernel was extracted using water extraction method (WES), water-ultrasonic extraction method (WSES), and alkali extraction method (AES). The results showed that the percentage of yield using WSE method was the highest (28.59 %) compared to starch yield from WE (15.51%) and AE (22.73%) methods. Furthermore, WSE extracted starch has higher amylopectin content (67.16%), swelling power (19.96 g/g) and solubility (12.72%) compared to WSES and AES. Starch with higher long chain amylopectin content tends to swell easily. Ultrasonic treatment on starch granules breaks down the crystal molecular structure resulting in higher water uptake through new hydrogen bonds thus increasing swelling and solubility properties. The FTIR spectra showed the presence of carboxyl and hydroxyl functional groups on WSE starch samples and found its similarity of these important functional groups with commercial tapioca and sago starch. Due to the excellent properties of WSE starch, it plays great potential as an alternative starch especially as the texture enhancer in the preparation and production of various foods.