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Research Article

Dual Modification of Chayotextle Starch: Effect on Physicochemical, Functional, and Structural Properties

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Abstract

Chemically modified starches are widely used as food additives to improve the appearance and physicochemical and biological properties of foods. The aim of this work is to chemically modify chayotextle (*Sechium edule*) starch by hydroxypropylation-crosslinking, and evaluate the effects of degree of substitution (DS), swelling power (SP), solubility index (SI), pasting, thermal properties, and morphological and molecular characteristics. Polar-Tex (modified maize starch) is used as control. The modified chayotextle starches (CHSs) exhibit a white color and DS values between 0.34% and 1.19% hydroxypropyl, depending on propylene oxide concentration-response. In addition, the SP and pasting properties are higher in modified CHS than in native CHS and Polar-Tex. The SI and temperature of gelatinization of modified starches decrease compared to native sample. The morphology of native and modified CHS granules is spherical and oval. Fourier transform infrared and nuclear magnetic resonance studies confirm the structural modifications of CHS by hydroxypropylation-crosslinking. Dual-modified CHS can be potentially used as an additive in the food industry.

Conflict of Interest