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Research Article

Effect of ultrasonic treatment on the morphological, physicochemical, functional, and rheological properties of starches with different granule size

R. Carmona-García, L. A. Bello-Pérez, A. Aguirre-Cruz, A. Aparicio-Saguilán, J. Hernández-Torres, J. Alvarez-Ramirez

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Abstract

Sonication (25 kHz) was applied to plantain (large granule size) and taro (small granule size) starches for two treatment durations (20 and 50 min) using a flow-cell at controlled temperature of 4 ± 0.1°C. The granule size distribution of starches was only slightly affected by the ultrasound treatment. Ultrasound affected the granule surface morphology, as reflected by the profound cavities and fractures. Starch with larger granule size was more affected by ultrasound treatment, as reflected by the higher variation in the peak viscosity, swelling power, and solubility. Peak viscosity increased with ultrasound, whereas swelling power and solubility decreased after treatment. Additionally, ultrasound treatment of high granule size starch resulted in a more pronounced decrease in the storage modulus (*G'*) compared with its native counterpart.

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