ABSTRACT

Structure-function relationship of rice starch is scarce in the literature. Starch was isolated from diverse Mexican rice varieties and their swelling power (SP), soluble solids (ss), thermal and pasting properties, XRD pattern, in vitro starch digestibility, and AP chain-length distribution were evaluated. Rice starches with low SP at 60°C had higher temperature and enthalpy of gelatinization. The peak viscosity of rice starches ranged between 2426 and 3519 cP, and the samples presented high values for setback due to the AM content. Rice starches presented the typical A-type XRD pattern with crystallinity values between 32.7 and 36.3%. Rice starches presented high amounts of short chains (A and B1), and differences were found among the cultivars. AM content for rice starches ranged between 18.4 and 22.9%, and the main fraction recorded by HPSEC was the Fraction III (short chains) with values around 60%. The uncooked rice starch samples presented high values of slowly digestible starch (SDS) and rapidly digestible starch (RDS), and differences were found among the cultivars. In cooked samples decreased SDS and increased RDS and RS. Onset temperature and enthalpy of gelatinization were correlated with the percentage of A-chains and an opposite pattern was found with the percentage of B1 chains. AP structural characteristics affect the functional, physicochemical, and digestibility properties of rice starches.

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