ABSTRACT

Starches from unripe fruits (mango, banana, and plantain) were acid modified to form different degrees of lintners with the objective to increase the slowly digestible starch (SDS) and RS contents. Molecular, thermal, and structural characteristics were evaluated. Mango starch showed higher susceptibility to acid hydrolysis than banana and plantain starches. The peak temperature of gelatinization (T_p) showed a decrease at low hydrolysis percentage, but at higher hydrolysis percentage the T_p increased. However, the enthalpy of gelatinization presented an increase with the hydrolysis percentage, but was not higher than its native counterpart. In general, the peak temperature and enthalpy of retrogradation increased with hydrolysis percentage due to formation of linear chains during the modification that promoted retrogradation. High performance size exclusion chromatography (HPSEC) analysis demonstrated the presence of multiple-branches (DP = 96–109), single branched (DP = 28–31), and linear (DP = 16–18) polymers in the fruit starch lintners. The acid treatment (lintnerization) of mango starch had no effect on the SDS fraction, while for plantain and banana starches, the SDS content increased (6.14–35.4%) at low hydrolysis percentage (0–50%) followed by a decrease at higher days of hydrolysis. At higher hydrolysis percentage (70–80%) the RS content increased for the three fruit lintners.

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