

Abstract

Pop corn, dent corn and baby corn (dent type) grains were fractionated into different fractions on the basis of their size. The starches were separated from these fractions and evaluated for physicochemical, morphological, thermal and rheological properties. Significant difference was observed in various properties among different fractions of dent corn and pop corn. Mean granule diameter of the starches separated from different fractions ranged between 6.33 and 13.64 μm . The shape of starch granules varied from oval to polyhedral. Baby corn starch showed the presence of oval shape granules whereas polyhedral shape granules were observed in starches from other corn types. Amylose content of starches from different corn types ranged between 15.3% and 25.1%. Baby corn starch showed lowest swelling power, solubility, amylose content and mean granule diameter. The transition temperatures (T_o , T_p and T_c) and enthalpy of gelatinization (ΔH_{gel}) of starches were determined using differential scanning calorimetry. T_o , T_p , T_c and ΔH_{gel} varied from 66.3 to 69.3, 71.5 to 73.1, 76.5 to 78 °C and 8.9 to 10.9 J/g, respectively. Baby corn starch showed lowest T_o , T_p , ΔH_{gel} and PHI. The values of these parameters were highest for both the fractions of dent corn and large grain fraction of pop corn starch. The rheological properties of the starches from different fractions of pop corn and dent corn measured using a dynamic rheometer, showed significant variation in the peak G' , G'' and peak tan values. Pop corn large grain fraction showed highest values for peak G' , G'' and breakdown in G' , whereas pop corn small grain fraction showed lower values of these parameters. The turbidity of the gelatinized aqueous starch pastes from all the corn types increased with increase in storage period. Baby corn starch showed the lowest and pop corn large grain fraction showed highest retrogradation values during storage.