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Occurrence of amylose–lipid complexes in teff and maize starch biphasic pastes

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Abstract

The occurrence of amylose–lipid complexes was determined in maize and teff starch biphasic pastes i.e. peak viscosity pastes at short and prolonged pasting times. Maize and teff starches were pasted for 11.5 and 130 min with or without added stearic acid followed by thermo-stable alpha-amylase hydrolysis in a rapid visco-analyzer. X-ray diffraction analysis of pastes before and residues after hydrolysis showed crystalline V-amylose diffraction patterns for the starches pasted for a prolonged time with added stearic acid while less distinct V-amylose patterns with non-complexed stearic acid peaks were observed with a short pasting time. Differential scanning calorimetry of pastes before and residues after paste hydrolysis showed that Type I amylose–lipid complexes were formed after pasting for the short duration with added stearic acid, while Type II complexes are formed after pasting for the prolonged time. The present research provides evidence that amylose–lipid complexes play an important role in starch biphasic pasting.