



HEAT-MOISTURE TREATMENT OF FOXTAIL MILLET STARCH: EFFECT ON PASTING, TEXTURAL AND RHEOLOGICAL PROPERTIES

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ABSTRACT

The impact of heat-moisture treatment carried out at moisture content basis of 20%, 25%, and 30% on the physicochemical, textural, pasting and rheological characteristics of foxtail millet starch was evaluated. The swelling capacity and solubility index of modified starches accelerated with temperature but decreased significantly ($p \leq 0.05$) with increased moisture percent. The decreased swelling capacity and solubility could be caused by the reduced stability of granules arising due to the disentanglement of double helices in the crystalline region of the starch granules. The heat-moisture treated foxtail millet starch depicted a decrease in the birefringence intensity at the granular centre and remained unaltered at the periphery. The reorientation of molecules of heat-moisture treated starches resulted in a significant ($p \leq 0.05$) decrease in peak viscosity, breakdown, and final viscosity. The significant ($p \leq 0.05$) increase in the gel hardness was observed for HMT20 as comparison to native starch. Dynamic rheological properties of the native and modified foxtail millet starches revealed the fragile gel structure. The increase in loss tangent of paste resulted in the gummy nature of starches.
