ABSTRACT

Effect of Drying Lactic Acid Bacteria Fermented Uji on Its Pasting Properties and Content of Carboxylic Acids

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The effect of fermentation and drying on the pasting properties and carboxylic acids of pure flours of maize, finger millet and cassava and of composite flours of maize-finger millet and cassava-finger millet were studied. The pasting properties were measured between 30°C and 96°C in a Brabender Amylograph while carboxylic acids from the uji slurries were determined on thin layer chromatography plates coated with 0.25 mm silica gel. Irrespective of the treatment given, the cereal flours of maize, finger millet and the composite of maize-finger millet consistently had higher onset and peak gelatinization temperatures than pure cassava or the composite of cassava-finger millet. Also the latter two flours developed higher peak viscosities and disintegrated more rapidly after attaining the peak than either pure maize, finger millet or the composite of maize-finger millet. The higher viscosities of the root flours was also reflected in the higher swelling powers and solubility values at 85°C. Fermentation increased the viscosity of the slurries. The greatest increases were recorded by maize (500BU) and the composite of maize-finger millet (780 BU). Fermentation did not affect gelatinization temperatures except for the maize-finger millet composite whose gelatinization temperature decreased by 10°C. Fermentation and drying resulted in increased viscosity when compared to the non-fermented flours, except for the drum dried cassava-finger millet composite. For all the drum dried flours there was a spontaneous increase in viscosity at 30°C when the Brabender Amylograph was switched on. The drum dried flours absorbed about four times their own weight of water; and since the starch granules were pregelatinized, reconstitution in cold water was difficult, as the flour particles tended to lump together, getting wetted on the surface and inhibiting the penetration of water into the interior. In contrast, sun and cabinet dried flours absorbed about 1.9 times their own weight of water and formed smooth slurries in cold water. Fermentation increased total titratable acidity and fixed acidity of the slurries to about 3.9% and 3.6% respectively, while the pH declined from 5.5 to 3.9. On drying there were no significant changes in ($p0.05$) from the uji prepared from fermented and nondehydrated slurries.

Keywords: Fermentation, Drying, Pasting properties, Carboxylic acids, Gelatinization temperatures, Viscosity