CHEMICAL COMPOSITION, THERMAL AND VISCOELASTIC CHARACTERIZATION OF TUBER STARCHES GROWING IN THE YUCATAN PENINSULA OF MEXICO.

ABSTRACT

Optical microscopy, *proximate analysis,* differential scanning calorimetry and rheological oscillatory tests were done to evaluate the physical, thermal and rheological properties of starches isolated from the tubers makal (*Xanthosoma yucatanensis*), sweet potato (*Ipomea batata*), cassava (*Manihot esculenta*) and sago (*Marantha arundinacea*). Mean starch granule size ranged from 10.6 to 16.5 μm. Makal and sweet potato starch granules were spherical, cassava starch granules were spherical-truncated and sago starch granules were polygonal.

The proximate composition showed that overall, the starches studied were within the group of the normal ones, with low fat and protein content (<7%) and amylose content <30%. Gelatinization peak temperature range was 61.3 to 78.4C and enthalpy (ΔH) range was 9.2 to 14.9 J/g. The rheological profiles of all tuber starches exhibited viscoelastic gel-like behavior with G′ (storage modulus) > G″ (loss modulus) at the tested amplitude and frequency ranges. Makal and sago starches are potentially useful in the manufacture of products requiring high processing temperatures. Sweet potato starch may have applications in food systems as a thickening and gelling agent, while cassava starch could be used to stabilize low viscosity foods.

http://onlinelibrary.wiley.com/doi/10.1111/j.1745-4530.2009.00362.x/abstract

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Revista: Journal of Food Process Engineering. Volume 34, Issue 2,_pages 363–382.