



STRUCTURAL AND RHEOLOGICAL DIFFERENCES BETWEEN FRUIT AND CEREAL STARCHES.

ABSTRACT

Starches are used for several purposes in industry depending on their functional properties, which are affected by their structural organization. The objective of this study was to evaluate the morphological, physicochemical and rheological characteristics of cereals (maize, *Zea mays* L., and barley, *Hordeum volgare* L.) and fruits (banana, *Musa paradisiacal*, and mango, *Mangifera indica*) starches. Maize starch granules were spherical, elliptical and polygonal, between 5 and 20 μ m; those of barley were spherical between 2 and 5 μ m and oval, between 15 and 25 μ m; those of mango starch were spherical or dome-shaped and split, with sizes between 5 and 12 μ m; those of banana were long, with an average length of 40 to 45 μ m. The X-ray diffraction pattern of cereal starches was type A- and that of fruits was type C-. The latter had higher pasting profiles and higher indexes of consistency than cereal starches. All starches exhibited non-Newtonian behavior. In their gels, the level of reorganization of the starches was not dependent on their source, but on their structure. Peak temperature and enthalpy of gelatinization was directly related to granule size. Their percentage of retrogradation, however, was independent of granule size and of X-ray diffraction pattern. Therefore, crystal organization depended on the conformation of the double helices of amylopectin. It is concluded that the use of starches depends on their structural organization that confers certain characteristics, regardless of the source.

<http://www.colpos.mx/agrocien/Bimestral/2012/jul-ago/jul-ago-12.html>

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