



ABSTRACT

There are areas in Mexico, where local varieties of blue corn are grown (*Zea mays* L.), which have variability in size, density and grain hardness as well as chemical composition. Although these variables are defined by genetic factors, they also depend on farming practices, climatic conditions and soil type. The physical characteristics of corn grain are related to production and yield aspects, while its chemical composition and Starch granules morphology, help to define the nutritional quality and its use in food processing. The objective of this study was to determine the physical and chemical properties of blue corn grain from two races and morphologically characterize the starch granules of the endosperm. The study was conducted at the Centre for Development of Biotic Products of the National Polytechnic Institute and the Valley of Mexico Experimental Station of the National Forestry, Agriculture and Livestock Research Institute. The samples were collected in the field with the producers, six Tabloncillo race materials at locations in Sinaloa and nine from Chalqueño race at Tlaxcala and Mexico State locations. Tabloncillo corn has small grains, higher hardness and damaged starch, and lowest levels of anthocyanins than Chalqueño corn has. The starch amount in both races was from 0.78 to 0.89 g g⁻¹ of dry sample, and they are classified as normal because of their amylose content. The starch granules were spherical with smooth surface and a bimodal distribution (small granules were 2-8 μm and large granules were 16-18 μm). The main differences between the two races were their grain size, floating rate and anthocyanin content.

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