CORRELATION BETWEEN THE SIZE OF GRANULES AND FUNCTIONAL PROPERTIES OF NATIVE STARCH FROM PROMISING CLONES OF CRIOLLA POTATO (Solanum tuberosum Group phureja)

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ABSTRACT

Criolla potato is a Colombian tuber widely accepted internationally. Therefore, CORPOICA has made improvement in plants for getting strong crops against pests and has gotten 10 promising clones with potential industrial evaluated by Universidad de La Salle. Clones were harvested in Granada and Sibate towns from Cundinamarca Department (Colombia), which were extracted native starch to evaluate the relationship between the size of granules and functional properties of these. The sizes of granules were found by optical microscopy (40X) and the granules showed shapes as: circular, oval and reniform, with 3μm of common diameter. Clones from Sibate had diameters between 0.2-22.2μm and from Granada between 0.7-23.1μm. The granules of native starches of two towns were thus: small (75-80%), medium (16-21%) and large (3-4%) diameters. The functional properties were determined in triplicate testing, as: swelling power (SP), water absorption index (WAI), water solubility index (WSI), brightness and opacity (BO) and Brabender viscosity. These testing showed the following ranges for the clones of two towns, thus: WAI 1.91-8.23 g gel/g sample, WSI 0.72-3.29 g insoluble/g sample, SP 1.92-8.32%, BO 8.5-20.5% and viscosity 2,020-3,982BU. The results were analyzed by Pearson correlation (r>0.9 of significance) and linear model general AOV/AOCV (p<0.05). By correlating the size of granules and functional properties showed significant differences for two towns because clones were affected by environmental condition of the soil. Clones from Granada showed higher WAI, SP and small granules percent than clones from Sibate. The gels formed were opaque for medium and large granules present with viscosities nearby.