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Rheological properties of Costa Rican guava (Psidium friedrichsthalianum (O. Berg) Niedenzu) pulp
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Costa Rican guava is a tropical fruit more aromatic and sour than the common guava, native from the seasonally flooded forest from south Mexico to northern South America. The interest for better understanding of processing and properties of this and other exotic fruits has been increasing due to their nutraceutical benefits [1]. An important tool for unit operations design and process optimization is the rheological characterization, which has not been studied yet for this exotic fruit. In the present work the dynamic shear rheological properties of Costa Rican guava (Psidium friedrichsthalianum (O. Berg) Niedenzu) pulp has been evaluated. Pulp samples were reconstituted with distilled water to 10 °Brix, from lyophilized and milled pulp. Flow behavior of the samples was measured at temperatures between 0-80 °C and evaluated using the Casson (C), Herschel-Bulkley’s (HB), Mizrahi-Berk (MB), Bingham (B) and power law (P) models. The yield stress was calculated by extrapolation from experimental data for the C, HB and MB models. The models best described the flow behavior were the P and the HB models (R2>0.95). The consistency coefficient (CC) and flow behavior index (F) of these models were described as function of temperature by Arrhenius (R2>0.95) and linear (R2>0.89) equations respectively. The results showed that CC decreased when temperature increased, with a significant change between 40 and 60 °C (16.99-7.96 Pa sn). The F was in the range of 0.27-0.32 and 0.31-0.41 for P and HB models, respectively. The temperature effect on yield stress was not significant for both models. The parameters of HB and P models of guava pulp were influenced by temperature; however yield stress of pulp could be affected by milling process. The obtained data are useful for future studies on food properties.