

Mucilage from Yam (*Dioscorea Rotundata*): Physico-Chemical, Rheological and Functional Characterization and Applications in Food Industry

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This research aims to characterize the freeze-dried mucilage of yam (*Dioscorea rotundata*) and evaluate its potential use as a stabilizer in mango nectar and vanilla-flavored ice cream. Yam mucilage was characterized physicochemically, rheologically, and functionally, for its later use as a stabilizer in mango nectar evaluating the concentration of stabilizers (0.01 and 0.03%) and mucilage: carboxymethyl cellulose (CMC) ratio (20:80, 50:50, 80:20 and 100:0). Likewise, the stabilizing properties of the mucilage were evaluated in soft vanilla cream ice cream, with the same factors changing the concentration of stabilizers (0.4 and 0.8%). The effect of the independent variables on the dependent variables with the analysis of variance (ANOVA) was determined and the Tukey multiple rank test was used to select the treatments that presented the best stability using the RStudio software. The proximal analysis of the mucilage showed that it contains 27.18% of protein and 18.94% of ash, which positions it as a possible source of minerals, and potential as an emulsifier. Infrared spectroscopy showed the most pronounced wavelength at 1638 cm⁻¹ present at the peptide bond R-CO-N corresponding to the amide group and the thermogravimetric analysis yielded a multi-stage decomposition starting to decompose the material after 220°C, Which allows the mucilage to be used up to this temperature. The functional properties of the mucilage reflected high solubility with values between 88 and 96.96% and swelling power of 75.69%, which show the water absorption of the mucilage. In addition, the suspensions of the yam mucilage presented a rheological behavior of the non-Newtonian fluid, specifically dilating. On the other hand, yam mucilage did not present good results as a stabilizer in mango nectar, because the best treatments were when using 20:80 mucilage:CMC ratio in both concentrations (0.01 and 0.03%), while the ice cream showed good behavior, which is evidenced by the results of physical stability when 100% mucilage was used, because the mucilage acts well as an emulsifier. However, the coefficient of consistency of the ice cream mixture was higher when the ratio of 20:80 mucilage: CMC with 0.8% stabilizers.