Influence of processing conditions on rheological properties of aqueous extract chia (Salvia hispanica L.) mucilage

ABSTRACT

The purpose of this study was to determine the effects of soaking temperature (25 and 80° C) and different processing conditions on the rheological properties of chia seeds (Salvia hispanica L.) mucilage. In this study, chia mucilage was first extracted using a ratio of seed to water at 1:10 for 4 hrs for control (25°C) and treated mucilage (80°C). Both extracted mucilage were evaluated in terms of yield, color, solubility, and water holding capacity. Then, the mucilage were subjected to different processing conditions including temperatures (5, 25, 45, and 65°C), pH (3, 5, 7, 9), sucrose concentrations (10, 20, 30, 40%), and salts (NaCl and KCl from 0 to 0.172 M; CaCl2 and MgCl2 from 0 to 0.049 M) to determine their rheological properties. Results show that high extraction temperature (80°C) significantly affected the mucilage yield higher than control. However, lightness (L*), solubility and water holding capacity of the treated sample were lower compared to control. Apparent viscosity of the 3% of mucilage for both extracts increases with temperatures and sucrose concentration. The high apparent viscosity of the treated mucilage at MgCl2 (0.049 M) and CaCl2 (0.049 M) concentration were found higher than 0.01 M. Meanwhile, NaCl (>0.069 M), KCl (>0.035 M), and CaCl2 (<0.03 M) had decreased the apparent viscosity value of the control sample. Thus, the treated mucilage could be suitable for application as a thickening agent in food.

Keyword: Chia seed; Chia mucilage; Aqueous extract; Thickener; Viscosity; Rheological properties