Discrimination of orange beverage emulsions with different formulations using multivariate analysis.

ABSTRACT

BACKGROUND: The constituents in a food emulsion interact with each other, either physically or chemically, determining the overall physico-chemical and organoleptic properties of the final product. Thus, the main objective of present study was to investigate the effect of emulsion components on beverage emulsion properties. RESULTS:In most cases, the second-order polynomial regression models with no significant ($P > 0.05$) lack of fit and high adjusted coefficient of determination (adjusted R(2), 0.851-0.996) were significantly fitted to explain the beverage emulsion properties as function of main emulsion components. The main effect of gum arabic was found to be significant ($P < 0.05$) in all response regression models. CONCLUSION:Orange beverage emulsion containing 222.0 g kg(-1) gum arabic, 2.4 g kg(-1) xanthan gum and 152.7 g kg(-1) orange oil was predicted to provide the desirable emulsion properties. The present study suggests that the concentration of gum arabic should be considered as a primary critical factor for the formulation of orange beverage emulsion. This study also indicated that the interaction effect between xanthan gum and orange oil showed the most significant ($P < 0.05$) effect among all interaction effects influencing all the physicochemical properties except for density.

Keyword: Turbidity; Average droplet size; Polydispersity index; Apparent viscosity; Beverage emulsion.