

Flow and Sensory Properties of Solid-Dispersed *Moringa Oleifera* Leaf Powder Effervescent Beverage Granules

Nontsikelelo Noxolo Tafu¹, Victoria A Jideani²

¹Food Science and Technology Department; Cape Peninsula University of Technology, Bellville, Cape Town, South Africa. ²Food Science and Technology Department; Cape Peninsula University of Technology, Bellville, Cape Town, South Africa

Abstract

In recent years, attention has been focused on functional foods and beverages due to heightened health awareness. *Moringa oleifera* leaf powder (MOLP), rich in various phenolic compounds, vitamins, and minerals, can be developed into a functional beverage in the form of effervescent granules. The objective of this study was to design, formulate and evaluate the flow and sensory characteristics of effervescent beverage granules of solid-dispersed MOLP (SDMOLP). SDMOLP effervescent beverage granules with varying acid (citric and tartaric acids at 1:1) concentrations 10%, 15%, and 20%, respectively, were developed using the wet granulation technique and optimised using a quadratic response design. The resulting effervescent granules were evaluated for physical and flow properties such as bulk density and tapped density, Hausner's ratio, Carr's index and angle of repose, mean particle size, pH, moisture content, and solubility time. In addition, the consumer acceptability of 6.5% of effervescent granules in water was assessed for appearance, colour, aroma, taste, texture, and overall acceptability using a 5-point hedonic test scale [1 (dislike very much) to 5 (like very much)], using 53 consumer panellists. Bulk and tapped densities ranged from 0.40 to 0.44 g/mL and 0.46 to 0.51 g/mL, respectively. The three formulations exhibited excellent flow properties. The pH and moisture content of effervescent granules differed significantly ($p < 0.05$). Mean hedonic scores of sensory attributes ranged from neither like nor dislike to like moderately for appearance (3.19-3.92), colour (3.23-4.04), aroma (4.00-4.13), taste (3.08-3.77), texture (3.04-3.66) and overall acceptability (3.40-4.00). Formulations with 15% and 20% acid were the most acceptable in aroma, taste, texture, and overall acceptability. This study has shown the feasibility of using SDMOLP as a functional ingredient for easy-to-drink effervescent beverage granules.