Abstract

Kombucha is a fermented beverage traditionally produced from sweetened tea and a symbiotic culture of bacteria and yeast (SCOBY), valued for its probiotic and antioxidant properties. However, concerns over the bitterness, caffeine content, and potential aluminum exposure from tea-based kombucha have prompted interest in fruit-based alternatives. This study aimed to evaluate the effects of different carrier agent types (maltodextrin, gum arabic, and their combination) and concentrations on the physicochemical properties and phenolic content of spray-dried strawberry kombucha, and to compare these with the properties of the liquid product. Strawberry kombucha was fermented for 14 days, then spray dried with varying carrier formulations. Key parameters assessed included moisture content, powder yield, solubility, color, total acidity, and total phenolic content. The results demonstrated that both carrier agent type and concentration significantly influenced powder quality. Gum arabic at lower concentrations (30%) and maltodextrin-gum arabic blends at moderate concentrations (35%) yielded powders with good color retention, solubility, and phenolic preservation. Compared to the liquid product,spray-dried powders were able to retain a substantial proportion of antioxidant activity and phenolic compounds, reaching 18.31 ± 2.26 (mg GAE/L) and 16.11 ± 0.87 (mg GAE/L) in 1:1 Ratios of maltodextrin and gum Arabic at concentrations of 35% and 40%. These findings highlight the potential of strawberry kombucha as a functional beverage substrate and underscore the importance of carrier optimization in spray drying to preserve phenolic and antioxidant content. Further research is recommended to refine carrier formulations and assess long-term stability and phenolic viability.

Keywords:
Carrier agents, Functional beverage, Phenolic content, Spray drying, Strawberry kombucha.