Microencapsulation of Morinda citrifolia L. extract by spray-drying

Abstract

Microcapsules containing Morinda citrifolia L. microparticles were produced by a spray-drying technique using various proportions of κ-carrageenan and maltodextrin as the binding materials. In this work, the effects of spray-drying on the encapsulation yield, particle size, moisture content, DPPH scavenging activity, total phenolic content and total flavonoid content of the bioactive components of M. citrifolia L. were determined for different volume ratios in the inlet air temperature range of 90-140 °C. The results showed that the percentage of 2,2-diphenyl picrylhydrazyl (DPPH) scavenging activity of the spray-dried powder was the highest for the 1:2 ratio (volume ratio of M. citrifolia L. extract to additive solution) at 90 °C, with maltodextrin at a concentration of 33. mg/ml. The results also showed that the microcapsules had a regular spherical shape. The spray-dried M. citrifolia fruit extract showed high antioxidant activity (28.36% DPPH activity), thus suggesting that it might be useful as a food additive and/or ingredient under the above optimum operating conditions.