Benjarat Tepsongkroh 2014: Effect of Polyglycerol Polyricinoleate and Biopolymers on the Encapsulation of Mango Seed Kernel Extract. Master of Science (Agro-Industrial Product Development), Major Field: Agro-Industrial Product Development, Department of Product Development. Thesis Advisor: Mrs. Thepkunya Harnsilawat, Ph.D. 108 pages.

Mango seed kernel extract (MSKE) is a good source of phenolic antioxidants but it is unstable to environmental conditions. Encapsulation technology offers the opportunity to solve it**.** Therefore, the objective of this study was to develop a system for encapsulating MSKE in W/O/W emulsions and producing encapsulated MSKE powder by spray drying. Initially, physicochemical characteristics of MSKE were studied. It found that the yield, total phenolic content and IC_{50} of MSKE were 6.27 %, 400.14 mg GAE/g and 11.14 µg/ml, respectively. Second, the influence of gelatin and NaCl in W/O/W emulsions containing MSKE was studied. In the mixture solutions containing gelatin (0-5 %), MSKE (1 %) and NaCl (0 or 100 mM), it was found that in the absence of NaCl, all mixture solutions were completely dissolved while in the presence of NaCl, mixture solutions containing 1% gelatin had precipitates. Considering the emulsion systems, the results showed that the presence of NaCl in the inner aqueous phase affected the stability of emulsions but did not affect the encapsulation efficiency (EE) values while the emulsion with the inner aqueous phase containing 1 % gelatin, 1 % MSKE and NaCl showed large droplet sizes and gave low EE. Third, the influence of polyglycerol polyricinoleate (PGPR) and biopolymers (gelatin and sodium alginate) concentration in W/O/W emulsions containing MSKE was studied. The results showed that PGPR affected the stability of the emulsions and EE. The presence of biopolymers in the inner aqueous phase of W/O/W emulsions increased EE. This may be due to the increase in the viscosity of biopolymers solution in the inner aqueous phases or the interaction between biopolymers and MSKE. Higher EE (more than 90 %) could be obtained when W/O emulsions stabilized by 1-5 % gelatin in inner aqueous phases were incorporated with 4-8 % PGPR, while sodium alginate required by 0.5-1.5 % sodium alginate in inner aqueous phases were incorporated with 8 % PGPR. Finally, the emulsions which contained 1 % gelatin in the inner aqueous phase and 4 % PGPR was selected to study the effect of maltodextrin (MD) concentration (10-30 %) on physicochemical properties of emulsions and encapsulated MSKE powder. It was found that MD concentration had an effect on the droplet size and viscosity of emulsions but did not affect EE. When considering the effect of MD on physicochemical properties of encapsulated MSKE powder, the results showed that increasing MD increased water solubility, L* values and surface bioactive compound but decreased water activity, a*, b*, chroma, hue angle, total bioactive compound and EE.

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