ABSTRACT

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CHARACTERISTICS AND ANTIOXIDANT ACTIVITY OF CURCUMINOIDS-NANOEMULSION FROM TURMERIC (Curcuma longa L.) AND THE APPLICATION IN KUNYIT ASAM DRINK

Turmeric (Curcuma longa L.) contains curcuminoids as bioactive ingredients which have many therapeutic activity such as antioxidant and anti-inflammatory activity. However, curcuminoids is fairly soluble in water. The alternative for insoluble substance is by making it as an emulsion. The aim of this research was to produce curcuminoids nanoemulsion (NE) by phase inversion method and the application in kunyit asam drink. The curcuminoids-NE was processed by ratio of oil-to-surfactant (o/s) and with or without the addition of co-surfactant. The o/s ratios which were applied in the NE were 0.03, 0.09, and 0.15. Droplet size, antioxidant activity, solubility of curcuminoids in the NE, stability, turbidity, and viscosity were analyzed for all curcuminoids nanoemulsions produced. The result showed that 0.15 o/s ratio and without the addition of co-surfactant was considered as the chosen formulation which had droplet size 14.8±0.7 nm, IC₅₀ of DPPH free radical 69.2254±2.1258 mg/mL, could solubilize 12.9±0.1 mg/g of curcuminoids, show no separation after centrifugation, quite turbid, and low viscosity (29.6±0.6 cP). In addition, zeta potential of the chosen curcuminoids-NE was -51.00 mV. The result showed that solubility of curcuminoids was proven to improve in NE while the antioxidant activity of curcuminoids-NE was lower compared to curcuminoids extract. The chosen curcuminoids-NE was applied in kunyit asam drink to improve the antioxidant activity with 4 different concentrations (5, 10, 15, and 20%) of curcuminoids-NE. Antioxidant activity and sensory evaluation were assessed to determine the chosen formulation. The result showed that kunyit asam drink with 10% curcuminoids-NE was selected as the chosen formulation with IC₅₀ 12.8975±0.0532mg/mL.

Keywords: Antioxidant, curcuminoids, kunyit asam, nanoemulsion
References: 97 (1992 – 2016)