

## The effect of surfactant on the solubility of kencur rhizome ethanol extract in self-nanoemulsifying drug delivery system

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<b>Abstract</b>	<p>Kencur (<i>Kaempferia galanga</i> L.) rhizome ethanol extract contains a lipophilic compound of ethyl p-methoxycinnamate. Self-nanoemulsifying drug delivery system (SNEDDS) formulation can increase the solubility of the extract in water. The purpose of this study was to determine the effect of surfactant combination on the kencur rhizome extract in the SNEDDS system. The SNEDDS formulations were carried out by selecting the surfactant ratio of Tween 80:Span 80 and Tween 80:Chremophor RH 40, followed by selecting the ratio of surfactant mixtures to polyethylene glycol 400 as co-surfactant, and to virgin coconut oil as the oil phase. The clarity, transmittance, emulsification time, particle size, and polydispersity index were evaluated. The stability test was carried out in aquadest, artificial gastric fluid, and artificial intestinal fluid for 4 hours at 37°C. The results showed that the combination of Tween 80: Chremophor RH 40 produced better SNEDDS than Tween 80:Span 80. The combination of surfactant-cosurfactant of Tween 80:Chremophor RH 40:PEG 400 at ratio 3:1 and 1:1 could produce homogenous dispersed SNEDDS showing droplet size of 23,0 and 21,8 nm; transmittance of 95.63% and 93.83%, and SNEDDS preconcentrate emulsified less than 35 seconds. The single surfactant Tween 80:PEG 400 at the ratio 3:1 produce better dispersed SNEDDS than the combined surfactant with droplet size 16.3 nm, transmittance 97.85%, and SNEDDS preconcentrate emulsified less than 45 seconds. The SNEDDS system could produce a smaller droplet size than the extract in aquadest.</p>
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