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## **Optimasi Tween 80 Dan PEG 400 Nanoemulsi Ekstrak Bunga Telang (*Clitoria ternatea L*)**

### **ABSTRAK**

**Latar Belakang:** Bunga telang (*Clitoria ternatea L*) memiliki beragam manfaat kesehatan karena kandungan zat bioaktifnya. Penggunaan nanoemulsi sebagai metode pengiriman sangat tepat karena mampu meningkatkan stabilitas dan bioavailabilitas zat bioaktif yang terkandung dalam bunga telang. Penelitian ini bertujuan untuk mengoptimalkan formulasi nanoemulsi dari ekstrak bunga telang. Komposisi nanoemulsi, termasuk jenis minyak, surfaktan, dan kosurfaktan, sangat mempengaruhi sifat fisik dan kinerja formulasi, *Virgin Coconut Oil* (VCO) digunakan sebagai minyak, sementara Tween 80 dan PEG 400 sebagai surfaktan dan kosurfaktan.

**Metode:** Penelitian ini merupakan penelitian eksperimental. Bunga telang (*Clitoria ternatea*) di ekstraksi dengan metode maserasi menggunakan pelarut etanol 90%. Metode yang digunakan dalam pembuatan nanoemulsi yaitu *Self-Nanoemulsifying Drug Delivery System* (SNEDDS) dengan metode energi rendah *spontaneous emulsification* (SE). Untuk mengoptimalkan perbandingan surfaktan dan kosurfaktan menggunakan *Design Expert Versi 13 Trial* dengan metode *Simplex Lattice Design* yang dianalisis dengan, ukuran partikel, PDI, dan persen transmitan.

**Hasil:** Berdasarkan hasil penelitian, didapatkan formula optimum dengan perbandingan tween 80 dan PEG 400 yang diperoleh *Design Expert* sebesar 21,915%:9.085% dengan nilai ukuran partikel 48,93nm, 22,14nm, 36,23nm, persen transmitan 96,437%, 97.778%, 97,668%, dan PDI 0,440, 0,497, 0,473 dengan nilai *desirability* 0,753.

**Simpulan:** Sediaan nanoemulsi ekstrak bunga telang memiliki karakteristik ukuran partikel dengan nilai mean 35,77nm, PDI 0,47 dan persen transmitan 97,294%.

**Kata Kunci:** Bunga telang, nanoemulsi, formula optimum.

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## **Optimization Tween 80 and PEG 400 Nanoemulsion of Telang Flower Extract (*Clitoria Ternatea L*)**

### **ABSTRACT**

**Background:** Butterfly pea flowers (*Clitoria ternatea L*) have various health benefits due to their bioactive substance content. The use of nanoemulsion as a delivery method is very appropriate because it can increase the stability and bioavailability of the bioactive substances contained in butterfly pea flowers. This research aims to optimize the nanoemulsion formulation from butterfly pea flower extract. The composition of the nanoemulsion, including the type of oil, surfactant, and cosurfactant, greatly influences the physical properties and performance of the formulation, *Virgin Coconut Oil* (VCO) is used as the oil, while Tween 80 and PEG 400 as the surfactant and cosurfactant.

**Methods:** This research is experimental research. Butterfly pea flowers (*Clitoria ternatea*) were extracted using the maceration method using 90% ethanol solvent. The method used in making nanoemulsion is the *Self-Nanoemulsifying Drug Delivery System* (SNEDDS) with a low energy *spontaneous emulsification* (SE) method. To optimize the ratio of surfactant and cosurfactant, use *Design Expert Version 13 Trial* with the *Simplex Lattice Design* method which is analyzed by particle size, PDI and percent transmittance.

**Results:** Based on the research results, the optimum formula with a ratio of tween 80 and PEG 400 obtained by Design Expert was 21.915%:9.085% with particle size values of 48.93nm, 22.14nm, 36.23nm, percent transmittance of 96.437%, 97.778%, 97.668%, and PDI 0.440, 0.497, 0.473 with a desirability value of 0.753.

**Conclusion:** The nanoemulsion preparation of butterfly pea flower extract has particle size characteristics with a mean value of 35.77nm, PDI 0.47 and percent transmittance of 97.294%.

**Keywords:** Butterfly pea flower, nanoemulsion, optimum formula.