ABSTRAK

Latar Belakang: Sinamaldehid dari kayu manis (*Cinnamomum burmanii*) berpotensi sebagai antidiabetes, namun memiliki kelarutan dan bioavailabilitas yang rendah sehingga perlu diformulasikan dalam bentuk *Self-Nanoemulsifying Drug Delivery System* (SNEDDS).
Tujuan: Mengetahui pengaruh konsentrasi tween 80 dan propilen glikol terhadap karakteristik fisik sediaan, serta mengetahui aktivitas antioksidan, formula optimal, dan aktivitas antidiabetes SNEDDS sinamaldehid secara *in vivo*.
Metode: SNEDDS sinamaldehid diformulasikan dengan variasi konsentrasi tween 80 dan propilen glikol. Sediaan dievaluasi karakteristik fisik, stabilitas, dan aktivitas antioksidan, kemudian ditentukan formula optimal untuk diuji aktivitas antidiabetes pada tikus hiperglikemia. Analisis statistik menggunakan *One-Way ANOVA* dan *Paired Samples T-Test.*
Hasil: Formula optimal diperoleh pada F3 dengan rata-rata ukuran partikel 14,4 nm, indeks polidispersitas 0,2301, zeta potensial -11,17 mV, pH 6,86±0,02, viskositas 363,6±1,7 cP, persen transmitan 99,46±0,35%, waktu emulsifikasi 12,67±0,06 detik, serta persen inhibisi DPPH sebesar 83,84±1,35%. Pemberian SNEDDS sinamaldehid dosis 40 mg/kgBB dan metformin dosis 500 mg/ 70 kgBB mampu menurunkan kadar glukosa darah puasa sebesar 43,90±12,78% dan 52,45±13,16%.
Kesimpulan: Variasi konsentrasi tween 80 dan propilen glikol memengaruhi karakteristik fisik sediaan. SNEDDS sinamaldehid memiliki aktivitas antioksidan berdasarkan nilai persen inhibisi terhadap DPPH serta menunjukkan aktivitas antidiabetes yang tidak berbeda signifikan dengan metformin.

Kata kunci: *in vivo, propilen glikol, sinamaldehid, SNEDDS, tween 80.*

ABSTRACT

Background: Cinnamaldehyde from cinnamon (*Cinnamomum burmanii*) has potential as an antidiabetic agent, but has low solubility and bioavailability. Therefore, it was formulated into a Self-Nanoemulsifying Drug Delivery System (SNEDDS).
Objectives: To determine the effect of varying concentrations of tween 80 and propylene glycol on the physical characteristics, to determine the antioxidant activity, optimal formulation, and in vivo antidiabetic activity of cinnamaldehyde SNEDDS.
Methods: Cinnamaldehyde SNEDDS was formulated using varying concentrations of tween 80 and propylene glycol. The formulation were evaluated for physical characteristics, stability, and antioxidant activity. The optimal formulation was selected for antidiabetic testing in hyperglycemic rats. Statistical analysis were performed using One-Way ANOVA and Paired Samples T-Test.
Results: The optimal formulation (F3) showed a mean particle size 14,4 nm, polydispersity index 0,2301, zeta potential -11,17 mV, pH 6,86±0,02, viscosity 363,6±1,7 cP, transmittance 99,46±0,35%, emulsification time 12,67 ± 0,06 seconds, and DPPH inhibition 83,84±1,35%. Cinnamaldehyde SNEDDS 40 mg/kg body weight and metformin 500 mg/70 kg body weight reduced fasting blood glucose by 43,90±12,78% and 52,45±13,16%.
Conclusion: Variations in tween 80 and propylene glycol concentrations affected physical characteristics of the formulation. Cinnamaldehyde SNEDDS exhibited antioxidant activity based on DPPH inhibition and antidiabetic activity that was not significantly different from metformin.

Key words*: in vivo, propylene glycol, cinnamaldehyde, SNEDDS, tween 80.*