

ABSTRAK

Daun bandotan (*Ageratum conyzoides* L.) merupakan tanaman liar yang banyak dimanfaatkan sebagai obat tradisional karena mengandung metabolit sekunder seperti flavonoid, alkaloid, terpenoid, tanin dan saponin yang berpotensi dikembangkan menjadi sediaan topikal. Penelitian ini bertujuan mengoptimasi komposisi Carbopol 940 sebagai *gelling agent* dan Trietanolamin (TEA) sebagai *alkalizing agent* yang optimal dalam sediaan emulgel ekstrak daun bandotan menggunakan metode desain faktorial (*Factorial Design*) 2^2 dengan Carbopol 940 pada level tertinggi 2 gram dan level rendah 0,5 gram, serta Trietanolamin (TEA) dengan level tertinggi 1,5 gram dan level rendah 1 gram. Sediaan yang dihasilkan akan dievaluasi berdasarkan parameter organoleptis, homogenitas, pH, viskositas, daya sebar dan stabilitas fisik sediaan. Analisis data dilakukan dengan *Two-Way ANOVA* dengan bantuan perangkat lunak *Design Expert ver. 13*. Hasil penelitian menunjukkan komposisi Carbopol 940 dan Trietanolamin berpengaruh terhadap sifat fisik emulgel. Carbopol cenderung menurunkan pH dan daya sebar sediaan tetapi meningkatkan viskositas sedangkan Trietanolamin meningkatkan pH dan viskositas namun menurunkan daya sebar sediaan. Area optimum diperoleh berada pada komposisi Carbopol 940 1,7 gram dan Trietanolamin 1,2 gram. Formula optimum diperoleh berdasarkan nilai *desirability* dan penelitian yang telah dilakukan, yaitu Formula Fa dengan komposisi Carbopol 940 sebesar 2 gram dan Trietanolamin (TEA) sebesar 1 gram.

Kata kunci: Optimasi, Carbopol 940, Trietanolamin, Emulgel, Ekstrak Daun Bandotan.

ABSTRACT

Ageratum conyzoides L. are widely utilized in traditional medicine due to their content of secondary metabolites, including flavonoids, alkaloids, terpenoids, tannins, and saponins, which have the potential to be developed into topical dosage forms. This study aimed to optimize the composition of Carbopol 940 as a gelling agent and Triethanolamine (TEA) as an alkalizing agent in an emulgel formulation containing *Ageratum conyzoides* leaf extract using a 2^2 factorial design. Carbopol 940 was evaluated at a high level of 2 gram and a low level of 0,5 gram. The resulting emulgel formulations were evaluated based on organoleptic properties, homogeneity, pH, viscosity, spreadability, and physical stability. Data were analyzed using Two-Way ANOVA with the assistance of Design-Expert version 13 software. The results demonstrated that the composition of Carbopol 940 and TEA significantly affected the physical characteristics and stability of the emulgel. Carbopol 940 tended to decrease the pH and Spreadability of the formulation while increasing its viscosity. In contrast, TEA increased the pH and viscosity but decreased the spreadability of the emulgel. The optimum region was obtained at a composition of 1,7 gram Carbopol 940 and 1,2 gram Triethanolamine (TEA). Based on the desirability value and experimental verification, the optimum formulation was formula Fa containing 2 gram Carbopol 940 and 1 gram Triethanolamine (TEA).

Keyword: Optimazition, Carbopol 940, Tierthanolamine, Emulgel, *Ageratum conyzoides* Leaf Extract.