

ABSTRAK

Latar Belakang: Tanaman binahong (*Anredera cordifolia* (Ten.) Steenis) memiliki aktivitas antibakteri dengan daya hambat sebesar 15,60 mm. Untuk mempermudah penggunaannya, dapat diformulasikan dalam bentuk sediaan pasta gigi gel. Formulasi dipengaruhi oleh *gelling agent* dan konsentrasinya, sehingga dapat dilakukan optimasi untuk memperoleh formula optimum.

Metode: Penelitian ini mencakup persiapan sampel, penentuan formula dengan metode *simplex lattice design*, pembuatan dan evaluasi sediaan, penentuan serta verifikasi formula optimum, dan uji aktivitas antibakteri. Optimasi dilakukan menggunakan *software* desain eksperimental dengan variabel optimasi berupa carbopol 940 (0,5–2%) dan trietanolamin (1–2,5%). Respon optimasi meliputi pH, viskositas, daya sebar dan tinggi busa. Analisis data menggunakan uji normalitas, *one sample t-test* dan *one-way ANOVA* dengan kepercayaan 95%.

Hasil: Hasil optimasi menunjukkan formula optimum terdiri dari carbopol 940 2,000% dan trietanolamin 1,000%. Sifat fisik yang dihasilkan adalah pH $5,546 \pm 0,122$; viskositas $8496 \text{ cP} \pm 738,676$; daya sebar $5,2 \text{ cm} \pm 0,264$; dan tinggi busa $1,4 \text{ cm} \pm 0,1$. Uji antibakteri formula optimal menunjukkan daya hambat 19,76 mm dengan kategori kuat.

Kesimpulan: Konsentrasi carbopol yang tinggi berpengaruh signifikan terhadap viskositas dan tinggi busa. Sedangkan konsentrasi trietanolamin yang tinggi berpengaruh signifikan terhadap pH dan daya sebar. Interaksi antara keduanya cenderung menurunkan daya sebar.

Kata Kunci: Ekstrak Daun Binahong, Carbopol 940, Trietanolamin, Optimasi, Antibakteri.

ABSTRACT

Background: Binahong plant (*Anredera cordifolia* (Ten.) Steenis) has antibacterial activity with an inhibitory power of 15,60 mm. To facilitate its use, it can be formulated in the form of gel toothpaste. The formulation is influenced by the gelling agent and its concentration, so that optimization can be carried out to obtain the optimum formula.

Method: This study includes sample preparation, formula determination using the simplex lattice design method, preparation manufacture and evaluation, determination and verification of the optimum formula, and antibacterial activity test. Optimization was carried out using experimental design software with optimization variables in the form of carbopol 940 (0,5–2%) and triethanolamine (1–2,5%). Optimization responses include pH, viscosity, spreadability and foam height. Data analysis used normality test, *one sample t-test* and *one-way ANOVA* with 95% confidence.

Results: The optimization results showed the optimum formula consisted of carbopol 940 2,000% and triethanolamine 1,000%. The resulting physical properties were pH $5,546 \pm 0,122$; viscosity $8496 \text{ cP} \pm 738,676$; spreadability $5,2 \text{ cm} \pm 0,264$; and foam height $1,4 \text{ cm} \pm 0,1$. The optimal formula antibacterial test showed an inhibition power of 19,76 mm with a strong category.

Conclusion: High concentration of carbopol significantly affects viscosity and foam height. While high concentration of triethanolamine significantly affects pH and spreadability. The interaction between the two tends to reduce spreadability.

Keywords: Binahong Leaf Extract, Carbopol 940, Triethanolamine, Optimization, Antibacterial.