

ABSTRAK

Daun binahong diketahui memiliki efek antibakteri. Karbopol 940 sebagai basis gel menghasilkan viskositas tinggi pada konsentrasi kecil, dan memiliki daya sebar yang sempit. Kombinasi dengan propilen glikol sebagai humektan mampu memperbaiki sifat fisiknya. Penelitian bertujuan untuk mengetahui pengaruh karbopol 940 dan propilen glikol terhadap sifat fisik gel ekstrak etanol daun binahong, menentukan formula optimum, mengevaluasi stabilitas fisik serta aktivitas antibakteri terhadap *P. acnes*.

Ekstrak diperoleh dari maserasi menggunakan etanol 96%. Optimasi formula menggunakan metode *Simplex Lattice Design* dengan respon sifat fisik viskositas, *adhesiveness*, dan *gumminess*. Verifikasi formula optimum dianalisis secara statistik dengan *one sample t-test* taraf kepercayaan 95%. Gel dari formula optimum diuji stabilitas fisiknya dengan metode *freeze-thaw* dan uji mekanik (sentrifugasi). Stabilitas fisik dianalisis statistik dengan uji *one way ANOVA* taraf kepercayaan 95%. Uji aktivitas antibakteri dilakukan terhadap *P. acnes*.

Hasil penelitian diperoleh bahwa meningkatnya konsentrasi karbopol 940 berpengaruh terhadap peningkatan viskositas, penurunan *adhesiveness* dan *gumminess*. Formula optimum diperoleh dengan kombinasi karbopol 940 2,0 % dan propilen glikol 14,0 %. Hasil uji stabilitas formula optimum tidak menunjukkan perubahan viskositas, *adhesiveness* dan *gumminess* yang signifikan. Gel dari formula optimum mampu menghambat pertumbuhan *P. acnes* dengan diameter daya hambat $10,1875 \pm 1,11$ mm.

Kata kunci: Binahong, Karbopol 940, Propilen glikol, *Propionibacterium acnes*

ABSTRACT

Binahong leaves are known to have an antibacterial effect. Carbopol 940 as a gel base produces high viscosity at small concentrations, and has a narrow dispersion. The combination with propylene glycol as a humectant can improve its physical properties. This study aimed to determine the effect of carbopol 940 and propylene glycol on the physical properties of the ethanolic extract of binahong leaves, determine the optimum formula, evaluate physical stability and antibacterial activity against *P. acnes*.

The extract was obtained from maceration using 96% ethanol. Optimization using the Simplex Lattice Design method with response to physical properties of viscosity, adhesiveness, and gumminess. The optimum formula verification was analyzed statistically with one sample t-test 95% confidence level. The gel from the optimum formula was tested for physical stability using the freeze-thaw method and mechanical test (centrifugation). Physical stability was statistically analyzed by the one way ANOVA 95% confidence level. Antibacterial activity tests were carried out on *P. acnes*.

The results showed that the increasing concentration of carbopol 940 had an effect on increasing viscosity, decreasing adhesiveness and gumminess. The optimum formula was obtained with a combination of carbopol 940 2,0% and propylene glycol 14,0%. The stability test results showed no significant changes in viscosity, adhesiveness and gumminess. The gel from the optimum formula can inhibit *P. acnes* growth with a diameter of inhibition of $10,1875 \pm 1,11$ mm.

Keywords: Binahong, Carbopol 940, Propylene glycol, *Propionibacterium acnes*