OPTIMASI CMC NA DAN GLISERIN PADA FORMULA GEL EKSTRAK ETANOL DAUN KERSEN (*Muntingia calabura* L.) DAN UJI AKTIVITAS ANTIBAKTERI TERHADAP *Staphylococcus aureus*

Salsabila Putri Handayani
Program Studi Farmasi

ABSTRAK

Latar Belakang: Ulkus diabetik dari diabetes mellitus berupa luka terbuka pada permukaan kulit dan adanya kematian jaringan tubuh. Bakteri patogen paling utama ditemukan pada ulkus diabetik, yaitu *Staphylococcus aureus.* Daun kersen (*Muntingia calabura* L.) dilaporkan mengandung senyawa metabolit sekunder yang berpotensi sebagai agen antibakteri dan diketahui ekstrak etanol 70% daun kersen (*M. calabura* L.) memiliki aktivitas antibakteri terhadap *S. aureus*. Namun, belum ada laporan sediaan gel dengan variasi *gelling agent* dan humektan sebagai agen antibakteri terhadap *Staphylococcus aureus*.

Tujuan: Mengetahui pengaruh variasi konsentrasi CMC Na dan gliserin terhadap karakterisitik gel dan aktivitas antibakteri terhadap *S. aureus*, serta mengetahui formula optimum sediaan gel ekstrak etanol 70% daun kersen (*Muntingia calabura* L.) dengan variasi konsentrasi CMC Na dan gliserin yang memiliki karakteristik fisik sediaan gel yang baik dan aktivitas antibakteri terhadap *S. aureus*.

Metode: Penelitian dilakukan dengan pembuatan simplisia dan ekstrak etanol 70% daun kersen (*Muntingia calabura* L.), karakterisasi simplisia dan ekstrak, kemudian uji aktivitas antibakteri ekstrak terhadap *Staphylococcus aureus*. Formulasi gel dibuat dengan variasi konsentrasi CMC Na dan gliserin, kemudian evaluasi sediaan gel, dan uji aktivitas antibakteri sediaan gel terhadap *Staphylococcus aureus*. Penentuan formula optimum dilakukan menggunakan *software Design Expert*.

Hasil: Formula optimum gel ekstrak etanol 70% daun kersen yang diperoleh melalui *Design Expert* adalah konsentrasi CMC Na 2,234% dan gliserin 11,766%. Sediaan gel kental, homogen, dan berwarna cokelat muda; pH 5,2 ± 0,03; daya lekat 0,5 ± 0,05 detik; daya sebar 5,13 ± 0,15 cm; dengan diameter zona hambat terhadap *S. aureus* 18,75 ± 1,02 mm.

Kesimpulan: Variasi konsentrasi CMC Na dan gliserin berpengaruh signifikan pada pH, daya lekat, dan daya sebar, tetapi tidak berpengaruh signifikan pada aktivitas antibakteri terhadap *S. aureus*. Formula optimum gel ekstrak etanol daun kersen adalah kombinasi konsentrasi CMC Na 2,234% dan gliserin 11,766%.

Kata kunci: *antibakteri, daun kersen, formula optimum, gel, karakteristik fisik.*

OPTIMIZATION OF CMC NA AND GLYCERIN IN THE GEL FORMULA OF CHERRY LEAF ETHANOL EXTRACT (*Muntingia calabura* L.) AND ANTIBACTERIAL ACTIVITY TEST AGAINST *Staphylococcus aureus*

Salsabila Putri Handayani
Pharmacy Program

ABSTRACT

Background: Diabetic ulcers from diabetes mellitus in the form of open wounds on the surface of the skin and the death of body tissues. The most pathogenic bacteria found in diabetic ulcers, namely Staphylococcus aureus. Cherry leaves (*Muntingia calabura* L.) are reported to contain secondary metabolite compounds that have potential as antibacterial agents and it is known that 70% ethanol extract of cherry leaves (*M. calabura* L.) has antibacterial activity against *S. aureus*. However, there have been no reports of gel preparations with variations of gelling agents and humectants as antibacterial agents against *Staphylococcus aureus*.

Objective: To determine the effect of variations in CMC Na and glycerin concentrations on gel characteristics and antibacterial activity against *S. aureus*, as well as determining the optimal formula of 70% ethanol extract gel preparations of cherry leaves (*Muntingia calabura* L.) with variations in CMC Na and glycerin concentrations that have good gel preparation physical characteristics and antibacterial activity against *S. aureus*.

Method: The study was conducted by making simplisia and 70% ethanol extract of cherry leaves (*Muntingia calabura* L.), characterizing simplisia and extract, then testing the antibacterial activity of the extract against *Staphylococcus aureus*. The gel formulation is prepared with variations in the concentration of CMC Na and glycerin, then the evaluation of the gel preparation, and the antibacterial activity test of the gel preparation against *Staphylococcus aureus*. Determination of the optimum formula is done using Design Expert *software.*

Results: The optimum formula of 70% cherry leaf ethanol extract gel obtained through Design Expert is CMC Na concentration of 2.234% and glycerin 11.766%. The gel preparation is viscous, homogeneous, and light brown in color; pH 5.2 ± 0.03; adhesion 0.5 ± 0.05 seconds; dispersion 5.13 ± 0.15 cm; with an inhibitory zone diameter to *S. aureus* 18.75 ± 1.02 mm.

Conclusion: Variations in CMC Na and glycerin concentrations had a significant effect on pH, adhesion, and dispersion, but had no significant effect on antibacterial activity against *S. aureus*. The optimum formula of cherry leaf ethanol extract gel is a combination of CMC Na concentration of 2.234% and glycerin 11.766%.

Keyword: *antibacterial, cherry leaves, optimum formula, gel, physical characteristics.*