

ABSTRAK

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OPTIMASI GEL KARBOPOL 940 DAN GLISEROL EKSTRAK ETANOL DAUN TEH HIJAU (*Camellia sinensis* (L.) Kuntze) SEBAGAI ANTIBAKTERI TERHADAP *Propionibacterium acnes*
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(xvi + 109 halaman; 7 tabel; 21 gambar; 17 lampiran)

Jerawat adalah gangguan kulit paling umum yang disebabkan oleh infeksi bakteri *Propionibacterium acnes*. Daun teh hijau memiliki aktivitas antibakteri karena mengandung senyawa katekin (senyawa flavonoid) karena dapat bekerja dengan mencegah sintesa dinding sel bakteri. Penelitian ini bertujuan untuk mendapatkan sediaan gel optimal dengan aktivitas antibakteri ekstrak daun teh hijau terhadap *Propionibacterium acnes*.

Ekstrak daun teh hijau diekstraksi menggunakan metode maserasi dengan pelarut etanol 70%. Uji aktivitas antibakteri ekstrak daun teh hijau pada konsentrasi 0,1%, 0,25%, 0,5%, 1%, 1,25%; 2,5%; 5%, kontrol negatif (DMSO 10%), kontrol positif (*vancomycin* 4 μ g/ml) dengan metode difusi sumur. Konsentrasi ekstrak daun teh hijau 1% diformulasikan dalam sediaan gel karbopol 940 dan gliserol yang dioptimasi menggunakan *Design Expert*® versi 13.0.5.0 metode SLD. Optimasi gel ekstrak daun teh hijau dilakukan evaluasi yaitu uji daya lekat, uji daya sebar dan uji pH. Uji aktivitas antibakteri sediaan gel dilakukan pada formula dengan ekstrak daun teh hijau 0,5%, 1% dan 2%, kontrol positif (basis gel yang mengandung *vancomycin* 8 μ g/ml) dan kontrol negatif (basis gel). Hasil uji aktivitas antibakteri gel dilakukan analisis data dengan uji ANOVA untuk menilai perbedaan pada tiap kelompok.

Rendemen ekstrak daun teh hijau 27,54%. Uji aktivitas antibakteri ekstrak memiliki daya hambat berturut-turut 0 mm; 5,41 \pm 0,46 mm; 6,73 \pm 0,05 mm; 7,59 \pm 0,3 mm; 8,75 \pm 0,19 mm; 8,98 \pm 0,21 mm; 11,55 \pm 0,61 mm; kontrol negatif 0 mm dan kontrol positif 9,52 \pm 2,2 mm. Hasil optimasi gel ekstrak daun teh hijau 1% diperoleh proporsi karbopol 940 0,8% dan gliserol 9,7%. Hasil evaluasi daya lekat 1,63 \pm 0,2 detik, uji daya sebar 5,19 \pm 0,05 cm dan uji pH 5,63 \pm 0,09. Formula gel memiliki daya hambat pada *Propionibacterium acnes* berturut-turut sebesar 5,18 \pm 0,29; 7,76 \pm 0,3; 8,62 \pm 0,1 mm, kontrol negatif 0 mm, kontrol positif 12,37 mm. Uji ANOVA diperoleh hasil yang berbeda signifikan pada tiap kelompok.

Kata Kunci: Ekstrak Daun Teh Hijau; Antibakteri; *Propionibacterium acnes*; Optimasi Gel

Referensi: 190 (1966 – 2022)

ABSTRACT

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OPTIMIZATION OF GEL CARBOPOL 940 AND GLYCEROL GREEN TEA LEAVES (*Camellia sinensis* (L.) Kuntze) ETHANOL EXTRACT AS ANTIBACTERIALS *Propionibacterium acnes*

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Acne is the most common skin disorder caused by infection with the *Propionibacterium acnes* bacteria. Green tea leaves have antibacterial activity because they contain catechin compounds (flavonoid compounds) because it can work by preventing the synthesis of the bacterial cell wall. This study aims to obtain an optimal gel preparation with antibacterial activity of green tea leaves extract against *Propionibacterium acnes*.

Green tea leaves extract was extracted using maceration method with 70% ethanol solvent. Antibacterial activity test of green tea leaves extract at concentrations of 0.1%, 0.25%, 0.5%, 1%, 1.25%; 2.5%; 5%, negative control (DMSO 10%), positive control (vancomycin 4 μ g/ml) using the well diffusion method. Green tea leaves extract concentration of 1% was formulated in carbopol 940 and glycerol gel preparations which were optimized using the Design Expert® version 13.0.5.0. with SLD method. Optimization of green tea leaves extract gel was evaluated, namely the stickiness test, spreadability test and pH test. Antibacterial activity test of gel preparations was carried out on formulas with green tea leaves extract 0,5%, 1% and 2%, positive control (gel base containing vancomycin 8 μ g/ml) and negative control (gel base). The results of the antibacterial activity test of the gel were analyzed using the ANOVA test to assess differences in each group.

The yield of green tea leaves extract was 27.54%. The extract antibacterial activity test had inhibition successively, 0 mm; 5.41 \pm 0.46mm; 6.73 \pm 0.05mm; 7.59 \pm 0.3 mm; 8.75 \pm 0.19 mm; 8.98 \pm 0.21 mm; 11.55 \pm 0.61mm; negative control 0 mm and positive control 9.52 \pm 2.2 mm. Optimization results of 1% green tea leaves extract gel obtained the proportion of carbopol 940 0,8% and 9,7% glycerol. The results of the evaluation stickiness test was 1.63 \pm 0,2 seconds, the spreadability test was 5.19 \pm 0.05 cm and the pH test was 5.63 \pm 0,09. The gel formula had an inhibitory activity against *Propionibacterium acnes* of 5,18 \pm 0.29 mm; 7.76 \pm 0,3 mm; 8,62 \pm 0,1 mm, negative control 0 mm, positive control 12.37 mm. The ANOVA test obtained significantly different results for each group.

Keywords: Green Tea Leaves Extract; Antibacterial; *Propionibacterium acnes*; Gel Optimization

References: 190 (1966 – 2022)