

ABSTRACT

ANTIBACTERIAL ACTIVITY TEST OF ETHANOL EXTRACT EMULGEL FROM MANGROVE BARK *Rhizophora apiculata* AGAINST *Streptococcus pyogenes* DAN *Pseudomonas aeruginosa*

By

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Background: *Streptococcus pyogenes* and *Pseudomonas aeruginosa* are pathogenic bacteria that cause various skin infections such as impetigo, erysipelas, cellulitis, and folliculitis. The extract of the bark of bakau minyak *Rhizophora apiculata* has potential antibacterial activity, and formulation into an emulgel offers advantages including improved stability, ease of application, and enhanced penetration of the active compound.

Methods: This laboratory experimental study employed the well diffusion, broth dilution, and agar dilution methods. The extract was obtained through maceration using 96% ethanol and subsequently subjected to phytochemical screening. The extract was then formulated into an emulgel and tested at concentrations of 0.5%, 1%, 2%, 3%, 4%, and 5%.

Results: The emulgel demonstrated an increase in inhibition zone diameters against *Streptococcus pyogenes* (2.56–7.20 mm) and *Pseudomonas aeruginosa* (3.46–6.10 mm) as the concentration increased, indicating weak to moderate antibacterial activity. The minimum inhibitory concentration (MIC) against *S. pyogenes* was observed at 4% and 5%, while the MIC against *P. aeruginosa* was achieved at 5%. Negative results were obtained for the minimum bactericidal concentration (MBC) for both bacteria.

Conclusions: The mangrove bark extract *Rhizophora apiculata* emulgel contained bioactive metabolites such as alkaloids, flavonoids, tannins, phenols, saponins, terpenoids and exhibited antibacterial effects by inhibiting the growth of *Streptococcus pyogenes* and *Pseudomonas aeruginosa* at a concentration of 3%, corresponding to a moderate inhibition level.

Keywords: Emulgel, *Rhizophora apiculata*, *Streptococcus pyogenes*, *Pseudomonas aeruginosa*.

ABSTRAK

UJI AKTIVITAS ANTIBAKTERI EMULGEL EKSTRAK ETANOL KULIT BATANG BAKAU MINYAK *Rhizophora apiculata* TERHADAP BAKTERI *Streptococcus pyogenes* DAN *Pseudomonas aeruginosa*

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Latar Belakang: *Streptococcus pyogenes* dan *Pseudomonas aeruginosa* merupakan bakteri patogen penyebab infeksi kulit seperti impetigo, erisipelas, selulitis, dan folikulitis. Ekstrak kulit batang bakau minyak *Rhizophora apiculata* berpotensi sebagai antibakteri, dan formulasi dalam bentuk emulgel dipilih karena memberikan stabilitas, kemudahan aplikasi, serta peningkatan penetrasi zat aktif.

Metode: Penelitian eksperimental laboratorik ini menggunakan metode sumuran, dilusi cair, dan dilusi padat. Ekstrak diperoleh melalui maserasi menggunakan etanol 96% dan diuji fitokimia. Ekstrak kemudian diformulasikan menjadi emulgel dan diuji pada konsentrasi 0,5%, 1%, 2%, 3%, 4%, 5%.

Hasil: Emulgel ekstrak menunjukkan peningkatan zona hambat terhadap *Streptococcus pyogenes* (2,56–7,20 mm) dan *Pseudomonas aeruginosa* (3,46–6,10 mm) seiring peningkatan konsentrasi, dengan efek lemah hingga sedang. KHM terhadap *Streptococcus pyogenes* positif pada konsentrasi 4% dan 5%, sedangkan terhadap bakteri *Pseudomonas aeruginosa* KHM tercapai pada konsentrasi 5% dan negatif untuk KBM pada kedua bakteri.

Kesimpulan: Emulgel ekstrak bakau minyak *Rhizophora apiculata* mengandung senyawa metabolit bioaktif seperti alkaloid, flavonoid, tanin, fenol, saponin, terpenoid dan memiliki efek antibakteri menghambat pertumbuhan *Streptococcus pyogenes* dan *Pseudomonas aeruginosa* pada konsentrasi 3%, yang termasuk kategori daya hambat sedang.

Kata Kunci: Emulgel, Bakau Minyak, *Streptococcus pyogenes*, *Pseudomonas aeruginosa*