

PENGARUH PERBEDAAN KONSENTRASI DAUN SIRIH MERAH (*Piper crocatum*) DENGAN METODE UAE (*Ultrasonic Assisted Extraction*) TERHADAP PERTUMBUHAN *Trichophyton rubrum* SECARA IN VITRO

ABSTRAK

Pendahuluan: Dermatofitosis merupakan infeksi jamur superfisial pada jaringan berkeratin yang paling sering disebabkan oleh *Trichophyton rubrum*. Daun sirih merah (*Piper crocatum*) diketahui mengandung senyawa metabolit sekunder yang berpotensi memiliki aktivitas antijamur. **Tujuan:** Penelitian ini bertujuan untuk mengetahui pengaruh perbedaan konsentrasi serta menentukan konsentrasi ekstrak daun sirih merah (*Piper crocatum*) yang paling efektif dalam menghambat pertumbuhan *T. rubrum* secara in vitro. **Metode Penelitian:** Penelitian ini merupakan penelitian eksperimental in vitro dengan desain *post-test only control group*. Ekstraksi daun sirih merah dilakukan menggunakan metode *Ultrasound-Assisted Extraction* (UAE) dengan pelarut etanol 70% pada konsentrasi 20%, 40%, 60%, dan 80%. Ketokonazol 2% digunakan sebagai kontrol positif dan DMSO 1% sebagai kontrol negatif. Uji aktivitas antijamur dilakukan dengan metode difusi sumuran. **Hasil:** Seluruh konsentrasi ekstrak daun sirih merah (*Piper crocatum*) menunjukkan aktivitas penghambatan terhadap pertumbuhan *T. rubrum* secara in vitro pada pengamatan 24 jam dan 48 jam. Pada pengamatan 24 jam, konsentrasi 20% menunjukkan daya hambat paling optimal. Pada pengamatan 48 jam, seluruh konsentrasi masih menunjukkan zona hambat, namun terjadi penurunan diameter zona hambat. Hasil uji *One Way ANOVA* menunjukkan tidak terdapat perbedaan bermakna antar variasi konsentrasi pada pengamatan 24 jam ($p > 0,05$), sedangkan pada pengamatan 48 jam terdapat perbedaan bermakna antar kelompok perlakuan ($p < 0,05$). **Kesimpulan:** Ekstrak daun sirih merah (*Piper crocatum*) berpotensi sebagai agen antijamur alami terhadap *T. rubrum* secara in vitro. Konsentrasi 20% merupakan konsentrasi yang paling efektif pada pengamatan 24 jam, dan penurunan diameter zona hambat pada pengamatan 48 jam menunjukkan bahwa aktivitas antijamur ekstrak bersifat fungistatik.

Daftar Pustaka: 56

Kata kunci: Dermatofitosis, daun sirih merah, difusi sumuran, *Trichophyton rubrum*, *Ultrasound-Assisted Extraction*.

Effect of Different Concentrations of Red Betel Leaf (*Piper crocatum*) Extract Obtained by Ultrasonic-Assisted Extraction (UAE) on the In Vitro Growth of *Trichophyton rubrum*

ABSTRACT

Introduction: Dermatophytosis is a superficial fungal infection of keratinized tissues and is most commonly caused by *Trichophyton rubrum*. Red betel leaf (*Piper crocatum*) is known to contain secondary metabolites with potential antifungal activity. **Objective:** This study aimed to determine the effect of different concentrations and to identify the most effective concentration of red betel leaf extract (*Piper crocatum*) in inhibiting the growth of *T. rubrum* in vitro. **Methods:** This study was an in vitro experimental study using a post-test only control group design. Red betel leaf extraction was performed using the Ultrasound-Assisted Extraction (UAE) method with 70% ethanol as the solvent at concentrations of 20%, 40%, 60%, and 80%. Ketoconazole 2% was used as the positive control and 1% DMSO as the negative control. Antifungal activity was tested using the well diffusion method. **Results:** All concentrations of red betel leaf extract (*Piper crocatum*) demonstrated inhibitory activity against the growth of *Trichophyton rubrum* in vitro at 24-hour and 48-hour observations. At 24 hours, the 20% concentration showed the most optimal inhibitory effect. At 48 hours, all concentrations still exhibited inhibition zones; however, a decrease in the diameter of the inhibition zones was observed. One Way ANOVA analysis showed no statistically significant differences among extract concentrations at 24 hours ($p > 0.05$), whereas at 48 hours, there were statistically significant differences among treatment groups ($p < 0.05$). **Conclusion:** Red betel leaf extract (*Piper crocatum*) has potential as a natural antifungal agent against *T. rubrum* in vitro. The 20% concentration was the most effective at the 24-hour observation. The reduction in inhibition zone diameter at 48 hours indicates that the antifungal activity of the extract is fungistatic.

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Keywords: Dermatophytosis, red betel leaf, *Trichophyton rubrum*, Ultrasound-Assisted Extraction, well diffusion.