

## Efek in vitro ekstrak etanol temulawak (*curcuma xanthorrhiza roxb.*) dalam menghambat biofilm *candida albicans* fase maturasi = In vitro effect of javanese turmeric (*curcuma xanthorrhiza roxb.*) ethanol extract in inhibiting of *candida albicans* biofilm on maturation phase

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### Abstrak

Latar belakang: Temulawak adalah tanaman obat asli Indonesia yang mengandung zat aktif xanthorrhizol dan memiliki efek antifungal. Dengan membentuk biofilm, *Candida albicans* menjadi virulen dan semakin virulen ketika mencapai fase maturasi.

Tujuan: Mengetahui potensi ekstrak etanol temulawak dalam menghambat biofilm *C. albicans* isolat klinis dan *C. albicans* ATCC 10231 pada fase maturasi.

Metode: Pemaparan ekstrak etanol temulawak berbagai konsentrasi pada biofilm *C. albicans* dimulai pada 1.5 jam setelah inkubasi dan dilanjutkan selama 48 jam. MTT assay digunakan untuk mengukur persentase viabilitas sel *C. albicans* pada biofilm yang kemudian dikonversi menjadi persentase inhibisi biofilm oleh ekstrak temulawak.

Hasil: Terhadap *C. albicans* isolat klinis, Kadar Hambat Minimum KHM dan Kadar Bunuh Minimum KBM ekstrak etanol temulawak adalah 15 dan 30, sedangkan terhadap *C. albicans* ATCC 10231 adalah 20 dan 35. Nilai Kadar Hambat Biofilm Minimum KHBM50 ekstrak etanol temulawak adalah 35 terhadap *C. albicans* isolat klinis dan 40 terhadap *C. albicans* ATCC 10231. Dibutuhkan konsentrasi ekstrak etanol temulawak yang lebih tinggi untuk menghambat *C. albicans* ATCC 10231 daripada untuk menghambat *C. albicans* isolat klinis.

Kesimpulan: Baik terhadap *C. albicans* isolat klinis maupun *C. albicans* ATCC 10231, ekstrak etanol temulawak berpotensi menghambat biofilm *C. albicans* fase maturasi.

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Background: Javanese turmeric is an Indonesian medicinal plant which contains xanthorrhizol had been reported to have antifungal effect. By forming biofilms, *C. albicans* becomes virulent and more virulent as it reaches the maturation phase.

Objective: To investigate the capability of Javanese turmeric ethanol extract in inhibiting the formation of maturation phase *C. albicans* biofilm both of clinical isolate and ATCC 10231.

Methods: The Exposure of various concentrations of Javanese turmeric ethanol extract to *C. albicans* biofilm started at 1.5 hours after incubation and continued for 48 hours. MTT assay was used to measure the percentage viability of *C. albicans* cells on the biofilm which was then converted into the percentage of biofilm inhibition.

Results: Against *C. albicans* clinical isolate, Minimum Inhibition Concentration MIC and Minimum Fungicidal Concentration MFC of javanese turmeric ethanol extract was 15 and 30 whereas against *C. albicans* ATCC 10231 was 20 and 35. Minimum Biofilm Inhibition Concentration MBIC50 of javanese turmeric ethanol extract was 35 against *C. albicans* clinical isolate and 40 against *C. albicans* ATCC 10231 biofilm. Higher concentration of the extract was required to inhibit *C. albicans* ATCC 10231 compared to the concentration to inhibit *C. albicans* clinical isolate.

Conclusion: Both against *C. albicans* clinical isolat and *C. albicans* ATCC 10231, javanese turmeric ethanol extract has potential in inhibiting mature phase of *C. albicans* biofilm.