

# Efek Ekstrak Etanol Temulawak (*Curcuma xanthorrhiza* Roxb.) Terhadap Fase Awal, Menengah, dan Maturasi Perkembangan Biofilm *Candida albicans* Isolat Klinis = Javanese Turmeric Ethanol Extract (*Curcuma xanthorrhiza* Roxb.) Effect on Early, Intermediate, and Maturation Phase of Clinical Isolate of *Candida albicans*' Biofilm Development

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## Abstrak

Latar belakang: Temulawak yang mengandung xanthorrhizol diketahui memiliki efek antijamur.

Xanthorrhizol dilaporkan mampu mengeradikasi biofilm *Candida albicans*.

Tujuan: Menganalisis korelasi antara efek hambat ekstrak etanol temulawak EET dengan perkembangan biofilm *C. albicans* isolat klinis pada berbagai fase, serta mengamati gambaran mikroskopis biofilm *C. albicans*.

Metode: Uji MTT digunakan untuk menguji viabilitas *C. albicans* pada biofilm dan dikonversikan persen hambat ekstrak etanol temulawak KHB50. Efek EET terhadap gambaran mikroskopis setiap fase perkembangan biofilm *C. albicans* diamati dengan Scanning Electron Microscopy.

Hasil: Nilai Konsentrasi Hambat Biofilm Minimal KHB50 EET terhadap biofilm *C. albicans* isolat klinis pada fase awal, menengah, dan maturasi secara berturut-turut adalah 20, 30, dan 35. Gambaran mikroskopis pada setiap fase perkembangan biofilm *C. albicans* terlihat penurunan jumlah sel dan densitas *C. albicans*, serta terhambatnya pembentukan filamen dibandingkan dengan kelompok tanpa perlakuan.

Kesimpulan: EET mampu menghambat perkembangan fase awal, menengah, dan maturasi biofilm *C. albicans* isolat klinis. Semakin matur fase perkembangan biofilm, *C. albicans* akan semakin resisten terhadap ekstrak temulawak. Paparan ekstrak temulawak memengaruhi kemampuan *C. albicans* isolat klinis dalam membentuk filamen serta menurunkan jumlah sel dan densitas biofilm.

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Background: Javanese turmeric which contains xanthorrhizol is known to have antifungal effect.

Xanthorrhizol is reported to be able to eradicate *Candida albicans*' biofilm formation.

Objective: Analyze the correlation between inhibition concentration of Javanese turmeric ethanol extract JTEE and each development phase of *C. albicans*' biofilm, and observing microscopic appearance of each phase of *C. albicans* biofilm.

Method: MTT assay was used to test the viability of *C. albicans* towards biofilm and converted to Minimum Biofilm Inhibitory Concentration MBIC50. JTEE's effect on each phase of microscopic appearance of *C. albicans*' biofilm is observed by Scanning Electron Microscopy.

Result: MBIC50 of JTEE towards development of clinical isolate of *C. albicans*' biofilm in the early adhesion and proliferation, intermediate, and maturation phase as follows 20, 30, and 35 respectively. The microscopic appearance on each phase of *C. albicans*' biofilm development shows decrease in cell number and density, as well as inhibition of filament formation compared with control group.

Conclusion: JTEE can inhibit the development phases of *C. albicans*' biofilm. The potency of JTEE to inhibit development of *C. albicans*' biofilm was decreased along with the maturation of biofilm. The JTEE's

exposure leads to changes of microscopic appearance of *C. albicans*' biofilm development.