Penurunan aktivitas enzim proteinase pada Biofilm Candida albicans yang telah diinhibisi oleh ekstrak etanol temulawak (Curcuma xanthorhhiza Roxb.) = Reduction of proteinase enzyme activity in Candida albicans Biofilm that had been inhibited by java turmeric (Curcuma xanthorrhiza Roxb.) ethanol extract

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Abstrak

Latar belakang: Pembentukan biofilm dan sekresi enzim hidrolase merupakan faktor virulensi Candida albicans. Salah satu enzim hidrolase yang disekresikan adalah enzim proteinase yang banyak diekspresikan pada biofilm matur Candida albicans. Temulawak yang merupakan tanaman berkhasiat obat khas Indonesia yang diketahui mampu menghambat pertumbuhan biofilm dan aktivitas enzim fosfolipase pada Candida albicans planktonik.

Tujuan: Melihat aktivitas enzim proteinase pada biofilm Candida albicans yang telah terinhibisi ekstrak etanol temulawak.

Metode: Pemaparan ekstrak etanol temulawak pada biofilm Candida albicans yang telah diinkubasi 90 menit, lalu diinkubasi lebih lanjut hingga mencapai fase awal (6 jam), menengah (24 jam), dan maturasi (48 jam). Biofilm yang telah terinhibisi dipindahkan pada media uji berupa bovine serum albumin agar (BSAA). Aktivitas enzim proteinase dianalisis dengan mengukur zona proteolysis yang terbentuk di luar zona koloni Candida albicans pada BSAA.

Hasil: Fase awal biofilm Candida albicans yang telah terinhibisi ekstrak etanol temulawak tidak terjadi aktivitas enzim proteinase, sementara pada fase menengah dan maturasi terlihat ada aktivitas enzim proteinase tetapi tidak setinggi aktivitas enzim proteinase pada kontrol negatif.

Kesimpulan: Terjadi penurunan aktivitas enzim proteinase pada berbagai fase pertumbuhan biofilm Candida albicans Candida albicans yang telah terinhibisi oleh ekstrak etanol temulawak.
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Background: Biofilm formation and hydrolase enzyme secretion are the virulence factor of Candida albicans. One of the hydrolase enzyme is secreted aspartyl proteinase or proteinase enzyme. This enzyme expressed more on mature biofilm of Candida albicans rather than on Candida albicans planktonic. Java turmeric is a native Indonesian plant which is known to have inhibition effect toward Candida albicans biofilm and could decrease the phospholipase enzyme activity of planktonic Candida albicans.

Objective: To observe the activity of proteinase enzyme in Candida albicans biofilm that had been inhibited by Java turmeric ethanol extract.

Method: exposure of Java turmeric ethanol extract to Candida albicans biofilm that had been incubated for

90 minutes, was followed by further incubation to reach early phase (6 hours), intermediate phase (24 hours), and maturation phase (48 hours) of biofilm formation. Inhibited biofilm then moved to the solid medium containing bovine serum albumin agar (BSAA). The activity of proteinase enzyme was analyzed by measuring the proteolytic zone seen outside the zone of Candida albicans colony on the BSAA.

Result: No activity of proteinase enzyme showed on early phase of biofilm formation that had been inhibited by Java turmeric ethanol extract. On intermediate and maturation phase of biofilm that had been inhibited by Java turmeric ethanol extract showed high activity on proteinase enzyme although not as high as the activity of biofilm that had not been inhibited.

Conclusion: The activity of proteinase enzyme is decreased on Candida albicans biofilm that had been inhibited by Java turmeric ethanol extract.