Analisis Transmission Electron Microscopy (TEM): ultrastruktur sel candida albicans ATCC 10231 pada biofilm fase maturasi yang terinhibisi ekstrak etanol temulawak (curcuma xanthorrhiza roxb.) = Transmission Electron Microscopy (TEM) analysis: candida albicans ATCC 10231 cell ultrastructure of maturation phase biofilm inhibited by javanese turmeric (curcuma xanthorrhiza roxb.) ethanol extract

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Abstrak

Pendahuluan: Salah satu faktor virulensi utama yang mempengaruhi perubahan Candida albicans(C. albicans) dari flora komensal menjadi patogen adalah pembentukan biofilm. Pada biofilm fase maturasi, C. albicansmenjadi lebih resisten terhadap agen antifungal. Telah dibuktikan efek inhibisi ekstrak etanol temulawak (Curcuma xanthorrhiza Roxb.) terhadap pertumbuhan biofilm C. albicans.
Tujuan: Menganalisis gambaran TEM sel C. albicans ATCC 10231pada biofilm fase maturasi yang terinhibisi ekstrak etanol temulawak (EET).
Metode: Penelitian ini dibagi dua kelompok yaitu kelompok perlakuan dan tanpa perlakuan. Sebanyak 100Î¼L suspensi C. albicans ATCC 10231dalam 96-well-plate diinkubasi selama 1.5 jam pada 370C,kemudian diaspirasi dan dibilas menggunakan PBS. Pada kelompok perlakuan dipapar 100Î¼LEET dengan konsentrasi KHBM50(35%), sedangkan kelompok tanpa perlakuan tidak dipapar EET. Kedua kelompok di inkubasi kembali hingga 48 jam, kemudian dipindahkan ke Eppendorf tube untuk difiksasi dalam 2.5% glutaraldehyde dan dilakukan pemeriksaan TEM. Kontrol positif dipapar nystatin oral suspension.
Hasil: Pemeriksaan TEM pada kelompok perlakuan, sel C. albicansATCC 10231 pada biofilm fase maturasi yang terpapar ekstrak etanol temulawak terlihat perubahan gambaran ultrastruktur yang berupa perubahan bentuk sel, penebalan dinding sel, pembesaran vakuola, dan iregularitas sitoplasma berikut organel-organel di dalamnya seperti disorganisasi pada nukleus, mitokondria, dan retikulum endoplasma. Sedangkan pada kelompok tanpa perlakuan menunjukan gambaran sel C. albicans ATCC 10231 normal.
Kesimpulan: Pemeriksaan TEM dapat menunjukkan perubahan sel C. albicans ATCC 10231 pada biofilm fase maturasi yang terinhibisi ekstrak etanol temulawak.
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Introduction: One of main virulence factor that influence the alteration of Candida albicans (C. albicans) from commensal flora into pathogenic flora is biofilm formation. At the maturation phase, C. albicans ismore resistant to antifungal agent. It has been proven that there is an inhibition effect of Javanese turmeric (Curcuma xanthorrhiza Roxb) on the growth of C. albicans biofilm.
Objective: To analyze the TEM image of C. albicans cell on the maturation phase of biofilm inhibit by Javanese turmeric ethanol extract.
Method: This research divided into two groups, there were treated group and untreated group. A 100Î¼LC. albicans ATCC 10231 suspension on a 96-well-plate incubated for 1.5 hour at 370C, and then aspirated and washed by phosphate buffer saline (PBS). The treated group was exposed to 100Î¼L Javanese turmeric ethanol extract as MBIC50 concentration (35%), while the untreated group was not exposed to Javanese

turmeric ethanol extract. Both groups were incubated until 48 h, and then moved into the Eppendorf tube and fixed with glutaraldehyde 2.5% to examine using TEM. The positive control was exposed to nystatin oral suspension.
Result: Compared to the negative control, C. albicans cell on biofilm maturation phase treated by Javanese turmeric extract ethanol extract shows the alteration on the its ultra structure. The alteration showed in shape, the thickness of cell wall, the enlargement of vacuole, and irregularity of cytoplasm include the organelles in it such as disorganization on nucleus, cytoplasm, and endoplasmic reticulum.
Conclusion: TEM examination showed the alteration of C. albicans ATCC 10231 cell on maturation phase biofilm inhibited by Javanese turmeric ethanol extract.