Analisis Transmission Electron Microscopy: Ultrastruktur Sel Candida albicans ATCC 10231 Pada Biofilm Fase Maturasi yang Tereradikasi Ekstrak Etanol Temulawak (Curcuma xanthorrhiza Roxb.) = Transmission Electron Microscopy Studies on Candida albicans ATCC 10231 Biofilm at Maturation Phase Which Has Been Eradicated by Javanese Turmeric (Curcuma xanthorrhiza Roxb.) Ethanol Extract

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Abstrak

Latar Belakang: Temulawak (Curcuma xanthorrhiza Roxb.), sebagai salah satu tanaman obat unggulan Indonesia, dilaporkan memiliki efek eradikasi terhadap biofilm Candida albicans (C. albicans). Studi analisis Scanning Electron Microscopy (SEM) melaporkan penurunan densitas biofilm serta perubahan morfologi sel C. albicans yang terpapar Ekstrak Etanol Temulawak (EET). Namun bagaimana perubahan ultrastruktur sel C. albicans pada biofilm fase maturasi yang tereradikasi EET belum diketahui. Tujuan: Menganalisis gambaran ultrastruktur sel C. albicans ATCC 10231 pada biofilm fase maturasi setelah paparan EET. Metode: Biofilm C. albicans diinkubasi selama 48 jam agar mencapai fase maturasi, kemudian kelompok perlakuan dipaparkan EET dengan konsentrasi sesuai kadar eradikasi biofilm minimal (KEBM) yaitu 30%, kelompok kontrol positif diberikan paparan nystatin 100000 IU/ml, dan kelompok kontrol negatif tidak diberikan perlakuan. Transmission Electron Microscopy (TEM) dipakai untuk melihat perubahan ultrastruktur sel C. albicans pada biofilm. Hasil: Perubahan gambaran ultrastruktur sel C. albicans pada biofilm fase maturasi yang dipaparkan EET meliputi perubahan bentuk sel, perubahan ketebalan dinding sel, serta kerusakan organel. Kesimpulan: Analisis TEM menunjukkan perubahan sel Candida albicans ATCC 10231 pada sebagian sel biofilm fase maturasi yang tereradikasi EET.

.....Background: Javanese turmeric (Curcuma xanthorrhiza Roxb.), as one of Indonesia’s eminent medicinal plant, had been reported for having eradication effect towards Candida albicans biofilm. SEM studies have shown that the exposure of javanese turmeric ethanol extract decreases the biofilm density and made changes in C. albicans cells morphology. However, the changes in cellular ultrastructure of C. albicans in biofilm at maturation phase which has been eradicated by javanese turmeric extract is not yet known. Objective: Analyzing the image of cellular ultrastructure of C. albicans ATCC 10231 biofilm at maturation phase after exposed to Javanese turmeric ethanol extract using Transmission Electron Microscopy. Method: C. albicans biofilm was incubated for 48 hours to achieve maturation phase, then the treatment group was exposed to 30% javanese turmeric ethanol extract according to the minimum biofilm eradication concentration, the positive control group was exposed to nystatin 100000 IU/ml, and the negative control group wasn’t exposed to anything. TEM was used to observe the cellular ultrastructure changes of the C. albicans biofilm. Result: The changes observed in the image of cellular ultrastructure of C. albicans biofilm treatment group were different cellular shape, different cell wall thicknesses, and damaged organelles. Conclusion: TEM analysis showed the changes occurred in the image of some cells in C. albicans biofilm at maturation phase which has been eradicated by javanese turmeric ethanol extract.