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Anti-adherence Effect of Brucea javanica and Piper betle Extracts on Oral Candida

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Objectives: The study aimed to investigate the anti-adherence effect of Brucea javanica and Piper betle extracts on the adhesion capacity of candidal cells, specifically on the non-specific and specific bindings.

Methods: The percentage of adsorption of candidal cells to hexadecane following treatment with the extracts was measured. An artificial mouth model was setup to mimic the oral environment. The salivary pellicles were treated with the extracts before the cell suspension of $10^6$ cells/mL was allowed to circulate in the system. The anti-adhesion was determined based on the reduction number of colony forming unit (CFU) relative to the untreated pellicle.

Results: All seven Candida species demonstrated hydrophobic binding affinity to hexadecane with C. krusei was the most hydrophobic (30.23 ± 4.63%), whereas the others were within the range of 7% to 10%. The hydrophobicities of candidal cells were significantly affected by the extracts ($P<0.05$). C. parapsilosis showed the highest affinity in specific-bindings to pellicle with $18.72 \pm 0.71 \times 10^3$ CFU/mL. Exposing to P. betle-treated pellicle drastically reduced C. tropicalis, C. albicans and C. krusei by 86.01%, 61.41% and 56.34%, respectively. B. javanica exhibited similar effect on C. tropicalis (89.86%), C. lusitaniae (88.95%), C. albicans (79.74%), C. glabrata (76.85%) and C. krusei (67.61%).

Conclusion: B. javanica and P. betle extracts have modifying effect on the surface hydrophobicity and demonstrate anti-adherence activity on the specific bindings between the candida and salivary pellicles.