GROWTH INHIBITORY EFFECT OF PIPER BETLE EXTRACT ON ORAL CANDIDA

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Introduction: Piper betle is a tropical plant belonging to the pepper family. The leaves of
P. betle have been reported to possess antimicrobial properties, thus making it widely used
as traditional remedy to treat infectious diseases including those occurring in the oral
cavity.

Objectives: The study was undertaken to evaluate the antifungal activities of P. betle against
oral Candida based on their growth profiles produced following treatment with the extract
of P. betle.

Materials and Methods: Crude aqueous extract of P. betle leaves was prepared and stored at
4°C. Seven strains of oral Candida species used in the study were purchased from the
American Type Culture Collection (ATCC), USA. The strains were C. albicans ATCC
14053, C. dubliniensis ATCC MYA-2975, C. glabrata ATCC 90030, C. parapsilosis ATCC
22019, C. krusei ATCC1243, C. lusitaniae ATCC64125 and C. tropicalis ATCC 13803. The
growth of the Candida was monitored periodically and the changes in the growth turbidity
were recorded. Growth curves of each of the strains were plotted and the generation time
was determined. The readings obtained were compared to those obtained following
treatment of the strains with the P. betle extract.

Results: At concentration of 12.5 mg/mL, which represents the minimal inhibitory
concentration (MIC) value of P. betle extract, it was found that P. betle was able to highly
suppress the growth of all oral Candida as indicated by the extended lag phase. These
suggest fungistatic effect of the extract whereby cells become dormant for a period of time
before being able to multiply. In addition, P. betle-treated Candida also exhibited reduction
in the generation time which involves the time taken for the cells to double. P. betle extract
has caused the growth generation time to reduce as much as 80.7% for C. dubliniensis
followed by C. parapsilosis (45.6%), C. albicans (35.8%), C. glabrata (30.1%), C. tropicalis
(17.43%), C. lusitaniae (12.95%) and C. krusei (3.14%). In addition, the cells were only able to
be in the log phase for a shorter period of time and ended with less population produced.
The presence of P. betle aqueous extract is thought to possibly interfere with the normal
biological functions and suppress the growth generation time of Candida species.

Conclusion: P. betle exhibited fungistatic activity towards oral Candida. The extended lag
phase and reduced generation time indicates the ability of P. betle extract to interfere with
the normal growth activities of the candidal cells that leads to the inhibition of growth.