

A preliminary study on antimicrobial activity of traditional and contemporary betel quids used in Sri Lanka

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Betel chewing has been practiced by Sri Lankans since ancient times. Chewing of traditional betel quid (TBQ) containing betel, herbs such as clove, nutmeg, cardamom, arecanut, coriander, and ginger is known to support oral health. However, beneficial effects of TBQ are not scientifically proven yet. TBQ has remarkably transformed to contemporary betel quid (CBQ) which is now identified as a major risk factor for the development of oral cancer with the introduction of tobacco and slaked lime. The present preliminary study aimed to demonstrate the antimicrobial activity of TBQ and CBQ.

Betel quids were prepared by mixing equal weights of dry ingredients and extracted in ethyl acetate in a soxhlet apparatus and dried in a rotary evaporator. Extracts were dissolved in dimethyl sulphoxide (DMSO) and tested for dose dependant antimicrobial effects by agar well diffusion method against three common pathogenic bacteria; *S. aureus*, *E. coli*, and *P. aeruginosa*, and five *Candida* species; *C. albicans*, *C. galbrata*, *C. parapsilosis*, *C. tropicalis* and *C. krusei*. DMSO was used as the negative control. Gentamicin and fluconazole were used as positive controls.

Our results revealed that ethyl acetate extracts of both TBQ and CBQ have inhibitory effects against *S. aureus*, *E. coli*, and *P. aeruginosa*. CBQ extract showed a significantly larger zone of inhibition for *S. aureus* (18mm) than for *E. coli* (15.3±0.6mm) and *P. aeruginosa* (13.7±1.5mm) at the highest concentration tested (30 mg/ml). At the same concentration, TBQ extract showed significantly larger zones of inhibition for *S. aureus* (16±1mm) as well as for *E. coli* (14±1mm) than for *P. aeruginosa* (11.7±0.6mm). However, there was no inhibitory effect of TBQ and CBQ extracts against any of the *Candida* species tested.

Accordingly, it is concluded that TBQ and CBQ have antibacterial activity against *S. aureus*, *E. coli*, and *P. aeruginosa* while they have no inhibitory effect on *Candida* species at the concentrations tested in this study. Further studies are warranted to demonstrate the effects of TBQ and CBQ against oral bacteria.

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