

Evaluation of Oral Biofilm Suppression by Caribbean Herbal Extracts

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Abstract : Background and significance: Oral biofilm formation is a well-known causative factor for caries and periodontal diseases. Scientists over the years have been trying to find a solution against the formation of oral biofilms. Though several advances have been made to understand the microbial ecology and how the bio film survives, it is still an enigma to researchers to find a chemical product that not only can inhibit the formation of oral bio film but also not disturb the oral micro flora required for oral health and not to cause damage to the cells of the oral cavity. One such product that has never been investigated much are herbal preparations. Some of the microorganisms important in the formation of biofilm are *Streptococcus mutans*, *Actinomyces naeslundii*, *Streptococcus oralis* and *Prevotella intermedia*. The aim of this study was to study the antimicrobial property of some herbal extracts available in Trinidad and Tobago against these pathogens. The significance of this study is that identification of biologically effective plant extracts can result in indigenous development of mouth rinses and tooth pastes that the people can benefit from to not only develop effective but also a cheap solution. Methodology: The extracts from the leaves of *Plectranthus amboinicus*, *Ocimum tenuiflorum*, *Azadirachta indica*, *Anacardium occidentale*, *Psidium guajava* were prepared by dissolving them in water. The extracts from the roots of *Curcuma longa* were prepared similarly and the antimicrobial activity of these six plant extracts was determined by the agar well diffusion method using minimum inhibitory concentration (MIC) against *Streptococcus mutans*, *Actinomyces naeslundii*, *Streptococcus oralis* and *Prevotella intermedia* and compared with chlorhexidine. Results: The six plant extracts showed variable effect on the oral micro-organisms. *Ocimum tenuiflorum* (16.66 ± 0.44 , 14 ± 0.58 , 13.33 ± 0.88 , 12.83 ± 0.60), *Azadirachta indica* (17.5 ± 0.28 , 14.83 ± 0.17 , 15 ± 0.58 , 12.83 ± 0.6) and *Curcuma longa* (16.16 ± 0.44 , 13.66 ± 0.88 , 12.33 ± 0.88 , 11.33 ± 0.67) were found to have highest inhibitory activity against all the four pathogens (*Streptococcus mutans*, *Streptococcus oralis*, *Actinomyces naeslundii*, and *Prevotella intermedia*) respectively. Conclusion: Although the extracts were not pure compounds we obtained antimicrobial results which determine that they are potent antimicrobial agents. Further derivation of pure compounds from these extracts could be lucrative as it might lead to the development of a cost effective and biologically safe medicine to act against oral biofilms. Acknowledgement: The authors would like to acknowledge the Campus Research and Publication Fund Committee, The University of the West Indies for funding this study and would also like to acknowledge Dr. Leonette Cox, Department of Chemistry, Faculty of Science and Technology, The University of the West Indies, St. Augustine Campus, Trinidad and Tobago for helping to prepare the plant extracts.

Keywords : agar well diffusion method, herbal extracts, minimum inhibitory concentration, oral biofilm forming microorganisms

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