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Determination of antimicrobial efficacy of some commercially available therapeutic mouthwashes

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Mouthwashes are medically formulated liquids, which are held in the mouth and swished by the action of perioral musculature to eliminate oral pathogens. Many mouthwashes are often used by people as they are prescribed by the dentistry, in order to prevent several oral conditions and to treat them. Many of the commercially available mouthwashes are claiming to have antimicrobial properties. This *in vitro* study, mainly aims to determine the different levels of antimicrobial efficacies in some commercially available therapeutic mouthwashes. The study included four commercially available mouthwashes and they were named as Mouthwash 1, 2, 3 and 4. A newly formulated Ayurvedic mouthwash was also included. The antimicrobial efficacies of these mouthwashes were tested against five selected microorganisms; namely, *Escherichia coli* ATCC 25922, *Staphylococcus aureus* ATCC 25923, *Pseudomonas aeruginosa* ATCC 27853, *Streptococcus pyogenes* and *Candida albicans*. Many of the microorganisms used in the test are significant in dentistry for causing several oral problems. Original concentration of the mouthwashes used in the study was decided as per the medical directions given for each mouthwash. Agar well-diffusion method and agar disc-diffusion method were used to determine the antimicrobial efficacy levels of the mouthwashes. Each experiment was replicated thrice. Validation test was carried out to confirm that the analytical procedure employed in the test is suitable for its intended use, which ensured there is no effect of penetrability of the substances in agar that may affect the results. The diameter of the inhibition zones obtained from the agar well diffusion and disc-diffusion methods were measured in each case and the obtained results were statistically compared using the Tukey's method. The results obtained from the Tukey's method indicated that the highest antimicrobial effectiveness was shown by mouthwash 1 against *C. albicans* in both disc diffusion and well diffusion methods showing an average inhibition zone diameter of 20.67 cm in both methods. The second highest antimicrobial effectiveness was shown by the mouthwash 1 against *S. pyogenes* and the third highest antimicrobial effectiveness was also shown by the mouthwash 1 against *E. coli*. The active antimicrobial component contained in Mouthwash 1 was chlorohexidine gluconate. When comparing the two non-herbal mouthwashes, the least effectiveness was showed by the mouthwash 2 against *P. aeruginosa*. Mouthwash 2 contained chlorohexidine digluconate as the active antimicrobial ingredient. The herbal and Ayurvedic mouthwashes did not show any antimicrobial properties in the particular tests.

Keywords: Mouthwash, Antimicrobial efficacy, Antimicrobial agents