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Antimicrobial Efficacy of Novel Hand Scrub with 4% Chlorhexidine Gluconate and Medicinal Aloe Against Selected Pathogens

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Abstract: Hand hygiene is effective in preventing healthcare-associated infections. Aim of this study was to develop a novel hand scrub and evaluate the antimicrobial efficacy against selected pathogens. The formulation was prepared using 4% chlorhexidine gluconate, aqueous extract of medicinal aloe (moisturizing agent) and distilled water. Agar well diffusion method was performed against selected standard cultures of microbes (*Escherichia coli* (ATCC 25922), *Enterobacter cloacae* (ATCC 23355), *Acinetobacter baumannii* (ATCC 19606), *Pseudomonas aeruginosa* (ATCC 27853), *Klebsiella pneumonia* (ATCC 70603), *Salmonella typhi* (Clinical isolates), *Shigella sonnei* (Clinical isolates), *Proteus mirabilis* (ATCC 12453), *Candida albicans* (ATCC 10231), *Streptococcus pyogenes* (ATCC 12384), *Enterococcus faecium* (ATCC 29212) and *Staphylococcus aureus* (ATCC 25923)) to evaluate *in-vitro* antimicrobial efficacy of the freshly prepared formulation. The stability was also studied by evaluating the physical parameters for three months at room temperature. Formulated hand scrub was found to be homogenous, liquid, and reddish with a pleasant odour. The mean values of inhibition zones for formulation were 23.10 ± 1.00 , 21.67 ± 0.58 , 20.00 ± 1.00 , 22.67 ± 0.58 , 17.67 ± 0.58 , 25.00 ± 1.00 , 23.50 ± 0.71 , 18.00 ± 1.00 , 34.33 ± 0.58 , 23.67 ± 0.58 , 24.33 ± 0.58 , and 27.33 ± 0.58 mm against *E. coli*, *E. cloacae*, *A. baumannii*, *P. aeruginosa*, *K. pneumonia*, *S. typhi*, *S. sonnei*, *P. mirabilis*, *C. albicans*, *S. pyogenes*, *E. faecium* and *S. aureus* respectively. Zero values were obtained for the inhibition zones for distilled water (Negative control) while the market product (Positive control) showed the inhibition zones of 8.00 ± 0.00 , 9.33 ± 1.15 , 11.33 ± 1.53 , 10.00 ± 0.00 , 10.00 ± 0.00 , and 12.33 ± 1.15 mm against *E. cloacae*, *S. typhi*, *C. albicans*, *S. pyogenes*, *E. faecium* and *S. aureus* respectively. In conclusion, the formulated hand scrub is having promising antimicrobial activity against the pathogens tested compared to the positive control.

Keywords: *chlorhexidine gluconate, hand scrub, medicinal aloe, pathogens*