Abstract

The microbial safety of cosmetic products is an important consideration. It is integral to ensuring the stability of the products for the entire shelf-life and to prevent damage to health of the consumers. Currently, the number of accepted substances for microbial stabilization is limited due to legal restrictions or public discussion. However, since the global consumers demand for natural ingredients is steadily increasing, the investigation of effectiveness of potential natural antimicrobials is necessary. To reduce microbial spoilage of cosmetics different approaches have been used. ‘Hurdle Technology’ and the intelligent combination of multifunctional additives help to design microbiologically stable products. The mixture of the intelligent combination of multifunctional ingredients using synergism and boosting effects can be a solution to protect products from microbial contamination. In this study, the *in vitro* antimicrobial activity of Nisin, cinnamon and turmeric extracts against cosmetic degrading microbes was investigated. Furthermore the extracts were combined to study their synergistic activity in cosmetics.

The study showed Nisin to be active against only gram positive organism, *S.aureus*. Cinnamon extracts showed activity against all cosmetic degrading microbes, while turmeric showed no activity against the selected organisms. The three substances were tried in various permutations and combinations to learn the best synergistic amalgamation. Turmeric showed no synergy with nisin or cinnamon. However, Cinnamon and Nisin showed appreciable synergy. The best synergistic combination of nisin and cinnamon was then applied in cosmetics. Preservative challenge test was used to study the synergistic effect. The results showed significant reduction in microbial load. If this natural antimicrobial compound showed stability with regards to different cosmetic formulation then a natural cosmetic preservative i.e., a bio preservative could be achieved.