Evaluation of antibacterial, antifungal and synergistic effect of ethanol and acetone extracts of Brassica nigra, Terminalia chebula, Anacyclus pyrethrumagainst pathogens involved in dental caries and periodontal diseases

Abstract

Introduction: Studying and investigating the antibacterial and antifungal properties of extracts extracted from plants is one of the main steps in knowing the effects of plants, in such a way that knowing these effects can be used to conduct studies and next steps for their clinical use. However, in previous studies, the antibacterial and antifungal effect of the mentioned plants has been investigated, but the effect of two by two and all three plants together in synergistic and antagonistic terms has not been investigated.

Materials and Methods: In this study, plant extracts were prepared by Soxhlet method. Then, pathogens were cultured in specific culture medium and their antimicrobial effect was determined by disk diffusion and microbroth dilution method. For data analysis, independent t-test was used to compare indicators, and one-way analysis of variance was used to compare these indicators between more than two groups.

Results: According to the conducted study, the acetone extract of Terminalia chebula with the lowest MIC, had the greatest effect on Streptococcus mutans bacteria. The acetone extract of Anacyclus pyrethrum with the lowest MIC, had the greatest effect on Pseudomonas aeruginosa. The acetone extract of Anacyclus pyrethrum and the acetone extract of combination of Terminalia chebula and Anacyclus pyrethrum with the lowest MIC, had the greatest effect on Candida albicans.The acetone extract of Anacyclus pyrethrum, acetone extract of combination of Terminalia chebula and Anacyclus pyrethrum with the lowest MIC, had the greatest effect on Lactobacillus bacteria and there was a significant difference between the MIC of acetone extracts (P.value <0.05).

Conclusion: According to the tests conducted, with the lowest MIC and MBC against all the bacteria examined, the acetone extract of Anacyclus pyrethrum, acetone extract of Terminalia chebula showed the most antimicrobial effect against all 4 microbia.

Keywords: Brassica nigra, Terminalia chebula, Anacyclus pyrethrum, herbal extract