

## **Evaluation of antibacterial, antifungal and synergistic effect of aqueous and methanol extracts of Brassica nigra, Terminalia chebula, Anacyclus pyrethrum against pathogens involved in dental caries and periodontal diseases**

### **Abstract**

**Introduction:** Studying and investigating the antimicrobial property of plant extracts is one of the key steps in understanding the effects of plants. In previous studies, the effects of Brassica nigra, Terminalia chebula and Anacyclus pyrethrum plant extracts on pathogens involved in caries and periodontal diseases and the effect of two by two and all three plants together in synergistic and antagonistic terms have not been investigated. This study aims to investigate the antimicrobial effect and effects Synergism of methanolic and aqueous extracts of the mentioned plants against pathogens involved in dental caries and periodontal diseases was performed.

**Materials and Methods:** In this study, extracts of medicinal plants were prepared by Soxhlet method. Then the pathogens Streptococcus mutans, Lactobacillus, Pseudomonas aeruginosa and Candida albicans were cultured in specific culture medium and their sensitivity to plant extracts was determined by disc diffusion method, as well as the minimum inhibitory concentration and minimum lethal concentration of plant extracts on microorganisms by microbroth dilution method. 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 investigations carried out in this study, the greatest antimicrobial effect of plant extracts against various microorganisms was as follows: 1) aqueous extract of Terminalia chebula and methanolic extract of Terminalia chebula – Anacyclus pyrethrum on Streptococcus mutans, 2) aqueous extract of Anacyclus pyrethrum and methanolic extract of Terminalia chebula on Lactobacillus, 3) Aqueous and methanolic extracts of Terminalia chebula on Pseudomonas aeruginosa, 4) Methanolic extract of Terminalia chebula on Candida albicans and aqueous extracts on Candida albicans did not show any antibacterial effect (P.value<0.05).

**Conclusion:** The methanolic and aqueous extracts of Terminalia chebula have the most antimicrobial properties against caries-causing pathogens and periodontal diseases

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