

EFFICACY OF *TRIFOLIUM PRATENSE* IN PREVENTING TOOTH DECAY

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ABSTRACT

The potential of *Trifolium pratense* (Red clover) in preventing tooth decay was evaluated during present study. Phytochemical analysis of the flowers of Red clover showed the presence of flavonoids, tannins, saponins, terpenoids and phenolic compounds Isoflavone profiling showed formononetin as the major compound, followed by genistein. Antimicrobial activity showed inhibition in the growth of oral pathogens like *Streptococcus salivarius* and *Candida albicans*. Synergistic studies with clove and cinnamon extracts showed enhanced antimicrobial effects. The antioxidant DPPH assay showed weak to moderate activity. Demineralization studies on teeth revealed better protective effect at lower concentrations. These findings suggested that red clover has the potential to act as a natural oral care agent, however, further clinical validation is required

Key words: Red clover, Dental caries, *Streptococcus salivarius*, *Candida albicans*, Demineralization

Introduction

Many studies are currently being conducted to identify suitable herbs for treatment of oral and dental hygiene. Red clover or *Trifolium pratense*, is one of them, which is a herbaceous flowering plant belonging to family Fabaceae (Esmaeili *et al.*, 2013). Its flowering tops, are rich in isoflavones such as genistein, daidzein, formononetin and biochanin A, which are widely used as herbal medicine (Raman *et al.*, 2025), especially in the field of dentistry (Abebe *et al.*, 2019). Present study was undertaken to evaluate antimicrobial, antioxidant, and anti-demineralization potential of red clover extract against oral pathogens and to determine its possible use in dental formulations

Materials and Methods

Commercial red clover flower powder was obtained from the dealers of herbal medicines, macerated with 95% ethanol,

fileted and concentrated in rotary evaporator. Cultures of *Streptococcus salivarius* (MTCC 13009) and *Candida albicans* (MTCC 227) were obtained from IMTECH, Chandigarh, and stored at -80 °C until used. Qualitative phytochemical tests were performed following Shaikh and Patil, (2020); and Tiwari *et al.*, (2020). Total phenolic content in the extracts was determined as described by Singleton *et al.*, (1965). The technique of High-Performance Liquid Chromatography (HPLC) was used to analyze the extract, as suggested by Krenn *et al.*, (2002). Antimicrobial activity of the extract was assessed by agar well diffusion technique following Bajpai *et al.*, (2024) method wherein diameters of the inhibition zones were measured in millimeters.

Synergistic antimicrobial activity of red clover extract in association with clove and cinnamon extracts was investigated against *Streptococcus*, *Staphylococcus*, *Bacillus* and *Candida* species by using agar well diffusion method on MHA and YPD plates. The antioxidant activity of the crude extract was