

Inhibition of Streptococcus Mutans Biofilm Development of Dental Caries In Vitro and In Vivo by Trachyspermum ammi Seeds: An Approach of Alternative Medicine

Authors : Mohd Adil, Rosina Khan, Danishuddin, Asad U. Khan

Abstract : The aim of this study was to evaluate the influence of the crude and active solvent fraction of *Trachyspermum ammi* on *S. mutans* cariogenicity, effect on expression of genes involved in biofilm formation and caries development in rats. GC-MS was carried out to identify the major components present in the crude and the active fraction of *T. ammi*. The crude extract and the solvent fraction exhibiting least MIC were selected for further experiments. Scanning electron microscopy was carried out to observe the effect of the extracts on *S. mutans* biofilm. Comparative gene expression analysis was carried out for nine selected genes. 2-Isopropyl-5-methyl-phenol was found as major compound in crude and the active fraction. Binding site of this compound within the proteins involved in biofilm formation was mapped with the help of docking studies. Real-time RT-PCR analyses revealed significant suppression of the genes involved in biofilm formation. All the test groups showed reduction in caries (smooth surface as well as sulcal surface caries) in rats. Moreover, it also provides new insight to understand the mechanism influencing biofilm formation in *S. mutans*. Furthermore, the data suggest the putative cariostatic properties of *T. Ammi* and hence can be used as an alternative medicine to prevent caries infection.

Keywords : bio-film, *Streptococcus mutans*, dental caries, bio-informatic

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