

**The Antibacterial Effects of Pimpinella  
Anisum Extracts on Mutans  
Streptococci in Comparison to  
Chlorhexidine**  
**(A comparative in vitro and in vivo study)**

**A Thesis**  
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## Abstract

**Background:** Pimpinella Anisum is one of the commonly utilized traditional medicines due to its pharmaceutical properties such as anti-inflammatory, anti-viral, anti-fungal, and anti-bacterial effects. It is employed as a flavoring agent in sweets and used to relieve coughs, sore throats and contraction of epilepsy also used in refreshing mouth and against bad breath.

**Aim of the study:** This study was conducted to test the effects of Pimpinella Anisum extracts on the growth, adherence, and acidogenicity of *Streptococci* and *Mutans Streptococci* in comparison with chlorhexidine and deionized water.

**Materials and methods:** Pimpinella Anisum was extracted using ethanol; Different concentrations of the extracts were prepared in gm/100 ml of deionized water. Chlorhexidine used as control positive and deionized water as control negative. Sample collected from 15 volunteers, they were divided into three groups each group rinse with one of the test agent (Pimpinella Anisum extract, chlorhexidine and deionized water) for 1min. Counts of bacteria recorded at five time interval (before rinsing, 1min., 15min., 30min. and 1hr). *Mutans Streptococci* were isolated from stimulated saliva of the students, purified and diagnosed according to morphological characteristics and biochemical tests.

**Results:** *Mutans Streptococci* were sensitive to different concentrations of the extracts in vitro. The diameter of inhibition zone was found to increase as the concentrations of the extracts increase; chlorhexidine shows higher inhibition zones than 6.5% and 7% of the extract, while the higher concentrations of the extract show higher inhibition zones than chlorhexidine. Statistically highly significant increase in the number of bacteria after 24 hr. was reported, also significant reduction when use

Pimpinella Anisum extract of concentration 7% and highly significant reduction when use concentration 7.5% and chlorhexidine. There was growing of dental plaque on the teeth treated with 6.5% and 7% Pimpinella Anisum extract, while teeth treated with 7.5% extract and chlorhexidine showed no accumulation of dental plaque, the effects of Pimpinella Anisum extracts of the concentrations 7% and 7.5% were effective in retardation of acid production in vitro.

6.5% Pimpinella Anisum mouth rinse had significantly antibacterial activity against salivary *Streptococci* in vivo. Highly significant differences between the extract and both chlorhexidine and deionized water after one min., 15 min. and 30 min. and after one hr. of rinsing. While the counts of *Mutans Streptococci*, there were significant difference after one min, and highly significant difference 15 min., and 30 min. and after one hour of rinsing, while significant differences between the extract and deionized water after one min. and highly significant differences for the rest time. There were no significant differences between extract and chlorhexidine at all time points regarding flow rate and pH, while between the extract and deionized water no significant differences after one min. highly significant differences for the rest time. While there was significant difference between the extract and deionized water at all time points except after 30 minutes it was highly significant difference regarding pH.

**Conclusion:** Pimpinella Anisum ethanol extract was effective against *Mutans Streptococci* and at high concentrations it is more effective than chlorhexidine.