

Molecular Basis of Anti-Biofilm and Anti-Adherence Activity of *Syzygium aromaticum* on *Streptococcus mutans*: In Vitro and in Vivo Study

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Abstract : The study examined the effects of *Syzygium aromaticum* extracts on the virulence properties of *Streptococcus mutans*. The activity of glucosyltransferases in the presence of crude and diethylether fraction was reduced to 80% at concentration 78.12µg/ml and 39.06µg/ml respectively. The glycolytic pH drop by *S. mutans* cells was also disrupted by these extracts without affecting the bacterial viability. Microscopic analysis revealed morphological changes of the *S. mutans* biofilms, indicating that these plant extracts at sub-MICs could significantly affect the ability of *S. mutans* to form biofilm with distorted extracellular matrix. Furthermore, with the help of quantitative RT-PCR, the expression of different genes involved in adherence, quorum sensing, in the presence of these extracts were down regulated. The crude and active fractions were found effective in preventing caries development in rats. The data showed that *S. aromaticum* holds promise as a naturally occurring source of compounds that may prevent biofilm-related oral diseases.

Keywords : biofilm, quorum sensing, *Streptococcus mutans*, *Syzygium aromaticum* extract

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