

Title: EFFECT OF NICOTINE ON METABOLISM OF STARVED AND UNSTARVED *STREPTOCOCCUS MUTANS*

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Streptococcus mutans is the major etiological agent of dental caries. Nicotine is the addictive ingredient present in most tobacco products that has been shown to have an effect on the growth and metabolism of oral bacteria, specifically *S. mutans*. This same bacterium has been recently linked to heart disease. Smokers regularly introduce this chemical into their system which causes an increased growth and metabolic rate of the bacteria, thus increasing their chances for dental caries. This research worked to further qualify the increase of metabolic rates by subjecting the bacteria to nicotine in a starved environment, on the basis that humans do not constantly have nutrients available to oral bacteria. Metabolic rates of an established biofilm of *S. mutans* were measured through an XTT and menadione assay with a spectrophotometer. The unstarved bacteria were grown in a full concentration of TSBS while the starved were grown in a 1:10 dilution of TSBS with sterile saline in various nicotine concentrations (0.0, 0.25, 0.50, 1.0, 2.0, 4.0, 8.0, 16.0, 32.0, 64.0, and 128.0 mg/ml). As the concentration of nicotine increase, the metabolic rates of *S. mutans* also increased. The high concentrations in which the bacteria were no longer metabolically active are very high and a normal smoker would not be able to reach these concentrations. However, as more nicotine is present in smokers these more metabolically active bacteria would be more likely to cause caries.