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ABSTRACT BOOK

  
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# COMPARISON OF THE EFFECT OF DIFFERENT GALLIC ACID ESTERS ON THE ABILITY TO INHIBIT *STREPTOCOCCUS MUTANS* BIOFILM FORMATION AND ACIDOGENICITY

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**Background and Aim.** Dental caries still has a high worldwide prevalence. Cariogenic bacteria such as *Streptococcus mutans* are implicated in the pathogenesis of dental caries due to the production of biofilm and organic acids from dietary sucrose. According to biological therapy trends, it is important to find the new pharmaceuticals in order to combat tooth decay without disturbing the balance of the oral ecosystem. This study aim is to investigate the efficacy of different gallic acid esters, which found naturally in plants, against *S. mutans* biofilm formation on solid surface and acidogenicity *in vitro* conditions.

**Material and Methods.** For the investigation, *S. mutans* UA159 bacteria were grown anaerobically in 24-well polystyrene cell culture plates, containing Todd Hewitt broth with 1% sucrose, under exposure to different concentrations of methyl gallate (550, 700, 850, 1000 µg/ml), ethyl gallate (610, 640, 670, 700 µg/ml), octyl gallate (27.7, 27.9, 28.1, 28.3 µg/ml) and lauryl gallate (30.5, 31.5, 32.5, 33.5 µg/ml). Untreated bacteria served as controls. After 24 h, biomass of the formed biofilm was evaluated using colorimetric assay and pH of the biofilm growth medium was measured with microelectrode. Data were analyzed using SPSS 23.0 program, One-Way ANOVA, LSD post-hoc test.

**Results.** The highest concentrations of studied gallic acid esters significantly reduced *S. mutans* biofilm biomass as well as prevented a decrease in pH level, as compared to controls ( $p < 0.05$ ). This investigation showed that gallic acid esters containing longer alkyl chains produce up to ~27.6-fold stronger inhibitory activity against *S. mutans* biofilm formation.

**Conclusions.** Due to capacity to inhibit effectively *S. mutans* biofilm formation and the acidogenicity, gallic acid esters with longer alkyl chain might be used as anticaries agents for oral formulations to reduce the prevalence of dental caries.

**Keywords:** ethyl gallate, lauryl gallate, methyl gallate, octyl gallate, *Streptococcus mutans*