

## EFFECT OF HIGH-FLUORIDE TREATMENT ON MICROBIAL COMPOSITION AND DENTINE DEMINERALIZATION USING A MULTISPECIES BIOFILM MODEL

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The aim of this study was to evaluate the effect of high fluoride content solution on dentine demineralization and bacterial composition in a multispecies biofilm model. In this *in vitro* study, a seven-organism bacterial consortium (*Streptococcus mutans* UA-159, *Streptococcus gordonii* DSM 6777, *Fusobacterium nucleatum* DSM 20482, *Actinomyces naeslundii* DSM 43013, *Veillonellaparvula* DSM 2008, *Lactobacillus casei* DSM 20011 and *Prevotellanigriscens* DSM 13386) was grown on bovine dentine discs in a high-throughput active attachment model. Each strain was cultivated individually and purity-checked. For inoculum growth,  $1 \times 10^8$  colony forming units of each strain was diluted in hog gastric mucin supplemented medium. 2 ml of the inoculum were placed in each well of a 24-well polystyrene plate. The biofilms were exposed to sucrose 0.2% supplementation during 8 h per day and the remaining 16 hours without sucrose with medium being refreshed daily. Additionally, biofilms were submitted two times per day to following solution treatments: 5000 ppm F (A), 1100 ppm F (B) and placebo solution as a negative control (C). After 5 days of biofilm growth, dentine samples were assessed by transversal microradiography (TMR) and biofilm collected for bacterial counts. All experiments were done in triplicate. Overall microbiological counts decreased with increasing F concentration. The values (mean  $\pm$  SD) of integrated mineral loss (IML, by TMR) for treatments A, B and C were respectively:  $421.29 \pm 33.80$ ,  $606.61 \pm 103.30$  and  $1390.54 \pm 198.82$ . Tukey post-ANOVA test showed statistical differences among all treatment groups, with lower IML values observed when treatment A was used in comparison with the other treatments ( $p < 0.05$ ). The 5000 ppm F solution caused a shift in microbial composition and reduced the dentin demineralization in this *in vitro* experimental model.

**Keywords:** fluoride, multispecies biofilm, dentine.

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