**In Vitro** Comparison of Stannous Fluoride, Sodium Fluoride, and Sodium Monofluorophosphate Dentifrices in the Prevention of Enamel Erosion

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**Abstract**

- **Objective**: To compare the relative performance of commercially available dentifrices containing different types of fluoride to reduce enamel erosion from citric acid.

- **Methods**: Two randomized parallel-group experiments were conducted, each with 48 bovine enamel samples randomly divided into six treatment legs. Each treatment leg went through 24 toothpaste treatment cycles, acid challenge (0.05M citric acid), and remineralization in artificial saliva. Total acid immersion after all cycles was 300 minutes for each test product; two test products in Experiment 1 were also evaluated for 180 minutes for comparison. Samples were analyzed blinded to treatment group for enamel loss by contact profilometry. One stabilized stannous fluoride (SnF₂) dentifrice was compared to three sodium fluoride (NaF) dentifrices, two sodium monofluorophosphate (MFP) dentifrices, and one MFP plus calcium sodium phosphosilicate (CSP) dentifrice. All fluoride levels were 1450 ppm. A water control was also included.

- **Results**: The dentifrice containing stabilized SnF₂ was significantly (p < 0.0001) better at preventing enamel erosion compared to the NaF and MFP dentifrices. The SnF₂ dentifrice provided a 61.7% (p < 0.0001) reduction in enamel loss versus the water control. The comparable figures for NaF and MFP dentifrices were 36–39% (p < 0.0001) and 33% (p < 0.0001) reductions, respectively, compared to the water control. The MFP+CSP dentifrice was significantly (p < 0.05) less effective, providing a 23.2% (p = 0.0007) reduction versus the water control.

- **Conclusion**: Of the dentifrices included in this research, the stabilized SnF₂ dentifrice was the most effective at reducing enamel erosion from citric acid.

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