

In-Vitro Antimicrobial Properties of a Bioactive Glass (NovaMin®) Containing Dentifrice

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Objective: The objective of this study was to determine the antimicrobial properties of a bioactive glass (NovaMin®) containing dentifrice against a number of common oral pathogens, and to compare these to a commercial fluoride dentifrice.

Methods: *S. mutans* (ATCC #25175), *S. sanguinis* (ATCC #10556), *F. nucleatum* (ATCC #10953) and *A. naeslundii* (ATCC #19039) were used in this study. The bacterial were grown in DE broth to a concentration of at least 10^6 CFU/ml. A non-aqueous base (glycerin) was used to formulate the bioactive glass containing dentifrices. NovaMin® was added in either 3% w/w or 10% w/w. A commercial, fluoride dentifrice was used as a control. The test articles were diluted 1:3 in distilled water, and the bacterial colonies were inoculated with the test articles. Two minutes after inoculation, aliquots were taken and plated on Brain Heart Infusion Agar for 3 to 7 days, depending on the organism to be counted. Viable CFU's were visually counted. All experiments presented represent the average of three replicates.

Results: The log reduction in viable CFU's for the NovaMin® containing dentifrices (both 3% and 10% w/w) and NovaMin® powder ranged from 4.5 log against *F. nucleatum* to 8.3 log against *S. sanguinis*. Log reduction of CFU's against *A. naeslundii* was 6.0 log for the NovaMin® dentifrices, and 6.6 log for the NovaMin® powder. By comparison, the log reduction in CFU from the commercial fluoride dentifrice was only 1.1 log against *A. naeslundii*, 1.3 against *F. nucleatum*, 1.4 against *S. mutans* and 3.0 against *S. Sanguinis*. All three NovaMin® formulations were significantly more effective at reducing bacterial count than the commercial fluoride dentifrice.

Conclusion: These tests demonstrate a strong anti-microbial effect of bioactive glass in a dentifrice formulation. These compounds may prove useful in maintaining optimal oral health.