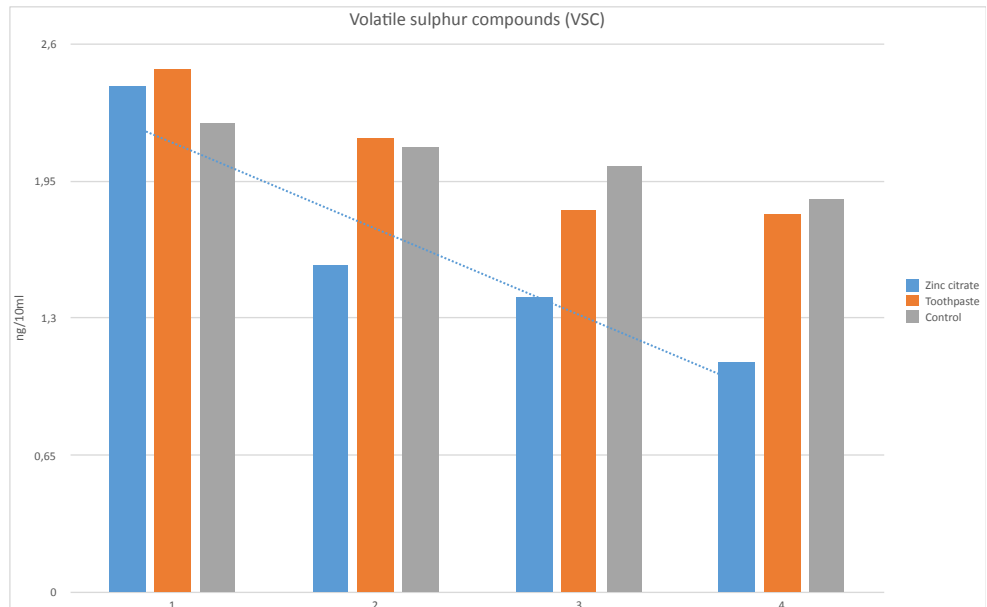


Zinc citrate:

Short-term effect of strontium- and zinc-containing toothpastes and mouth rinses on volatile sulphur compounds in morning breath: a randomized, double-blind, cross-over clinical study.

Eur J Oral Sci 2015
Soares LG1,
Jonski G,
Tinoco EM,
Young A.



Abstract 1

Zinc (Zn) reduces the formation of volatile sulphur compounds (VSCs) associated with oral malodour.

Although strontium (Sr) is included in some products for reducing dental hypersensitivity, it may also have anti-halitosis properties. This randomized, double-blind, cross-over clinical study compared the anti-VSC effect of brushing with commercial toothpastes and rinses containing Zn and Sr. The volunteers (n = 30) either brushed/rinsed with/without tongue brushing using Zn-containing toothpaste/rinse, Sr-containing toothpaste/rinse, or

placebo (control). Volatile sulphur compounds [hydrogen sulphide (H₂S) and methyl mercaptan (CH₃SH)] were measured, in morning breath, using gas chromatography.

The anti-VSC effects of the test toothpastes and test rinses were significantly better than the anti-VSC effects of the respective controls.

Toothbrushing with test toothpastes gave median reductions, compared with the control, of 70% for H₂S and 55-57% for CH₃SH. Rinsing with the Sr- and Zn-containing solutions had the same anti-VSC effect

as toothbrushing and tooth- and tongue brushing with the Sr- and Zn-containing toothpastes. Zinc-containing rinse resulted in a significantly higher median salivary level of Zn compared with brushing with Zn-containing toothpaste, although this effect did not correlate with the anti-VSC effect.

It can be concluded that the Sr- and Zn-containing toothpastes and the Zn- and Sr-containing rinses, when used in the evening, are equally effective in reducing morning-breath VSCs the following day.

Zinc citrate:

The Effect of Zinc-Citrate- Containing Dentifrice for Oral Malodor Control: A Clinical Study. Int J Clin Prev Dent 2016 Eun-Jin Cho, Hae-Woo Lee, Sung-Min Park, Hyung-Seo Koo, In-Sik Cho, Ja-Won Cho

Abstract 2

Objective:

The aim of this study is to investigate the effect of Zinc citrate containing dentifrice for oral malodor control.

Methods:

The experimental dentifrice containing zinc citrate, the comparison dentifrice, and the control dentifrice prepared from the removal of major constituents of the experimental dentifrice were applied to the experimental group (n=30), the comparison group (n=30), and the controlled group (n=30). Thus, a total of 90 volunteers were instructed to use the corresponding dentifrice for 4 weeks. Calculus index, papillary marginal attachment gingivitis

index, gingival index, patient hygiene performance index, and plaque index were measured at a total of 4 sessions, i.e., prior to the experiment, at week 1, at week 2, and at week 4. The degree of mouth odor was recorded with the Oral Chroma and B&B checker.

Results:

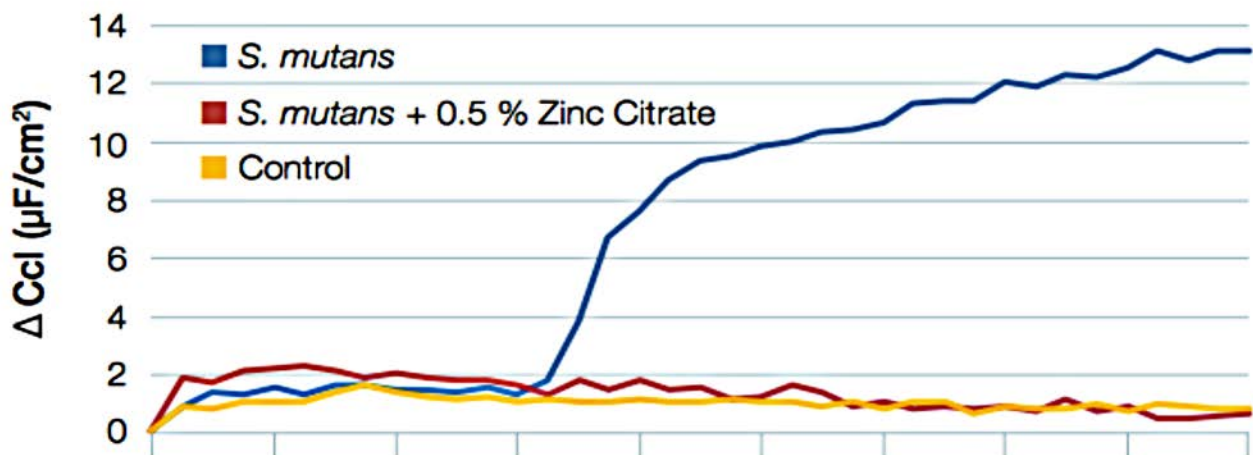
Pre-experimental measurements of volatile sulfur compounds using Oral Chroma were 2.40 ng/10 ml in the experimental group, 2.48 ng/10 ml in the comparison group, and 2.22 ng/10 ml in the controlled group. At 4 weeks, these values were decreased to 1.09 ng/10 ml, 1.79 ng/10 ml, and 1.86 ng/10 ml, respectively. The mouth odor was significantly reduced

in the experimental group. Pre-experimental mouth odor measures using the B&B checker were 70.2 BBV in the experimental group, 70.9 BBV in the comparison group, and 72.5 BBV in the controlled group. At 4 weeks, these values were decreased to 49.5 BBV, 59.9 BBV, and 62.9 BBV, respectively.

The experimental group showed a significant reduction in mouth odor after week 2.

Conclusion:

These results indicated that a zinc citrate containing dentifrice was more effective and prompt, as compared with a conventional type of dentifrice for mouth odor.



Erythritol:

Comparative inhibitory effect of xylitol and erythritol on the growth and biofilm formation of oral Streptococci. African Journal of Microbiology Research 2012 Gholam Reza Ghezalbash*, Iraj Nahvi and Mohammad Rabbani Department of Biology, Faculty of Science, University of Isfahan, Isfahan 81746-73441, Iran. Accepted 22 March, 2012

Table 1. Growth inhibition of xylitol and erythritol on oral streptococci.

Polyol	Concentration (% w/v)	Percentage reduction (%) of ^a		
		<i>S. mutans</i>	<i>S. sobrinus</i>	<i>S. sanguinis</i>
Xylitol	2	66	71	57
	4	68	72	65
Erythritol	2	69	71	76
	4	71	76	77

^aData points: mean values from three independent experiments, *significance level set at P<0.01.

Abstract

Our aims were to examine the effects of xylitol and a novel polyol sweetener, erythritol, on growth of oral Streptococci and compare their effects. The inhibitory effects of xylitol and erythritol on Streptococcus strains, as well as on streptococcal biofilm formation were examined. Streptococcus mutans, Streptococcus sobrinus, and Streptococcus sanguinis were

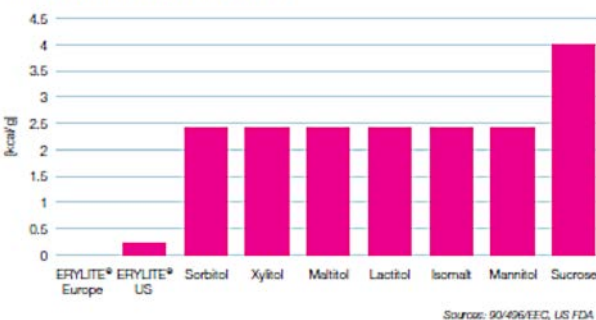
used as representatives of oral Streptococci.

The effects of these polyols on biofilm formation were determined by microtiter plate assay. The growth was compared at each experiment using analysis of variance of repeated measures (SPSS 16.0 for Windows). Our results indicated that in the presence of 4% xylitol and 4% erythritol the growth of *S. mutans* was decreased by 68 and 71%, respectively. Biofilm formation by *S. mutans* was reduced to 31.32%

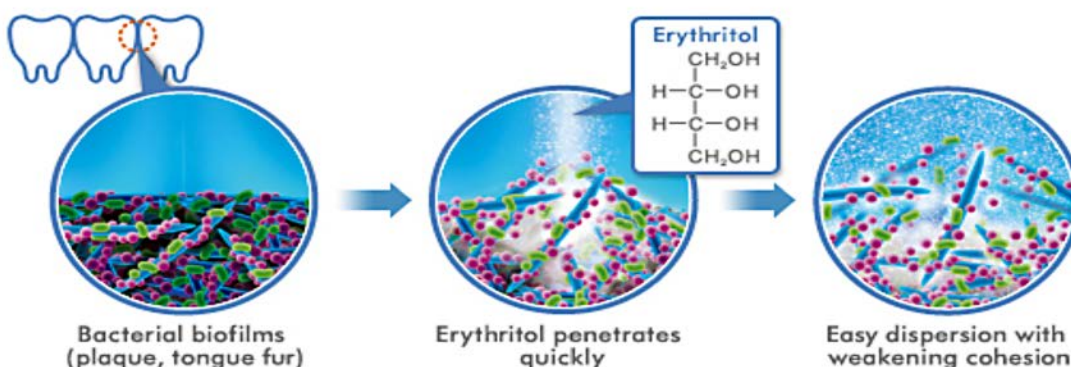
Laxation thresholds of ERYLITE® and other polyols



Caloric value of polyols and sucrose



in the presence of 4% erythritol. Regardless of concentration, in general, erythritol was found more effective than xylitol in inhibiting the growth and biofilm formation of Streptococci strains used in this study. Xylitol and especially erythritol both inhibited microplate surface adherence of oral Streptococci, which are known to contribute to plaque accumulation.

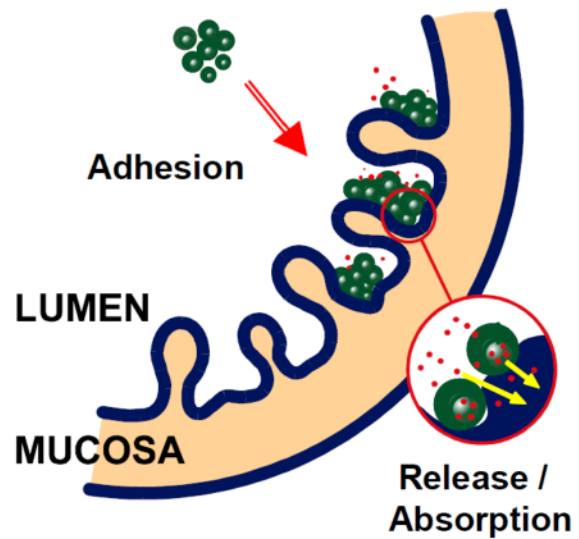


Muco-adhesive polymer:

Bio adhesion is the mechanism by which two biological materials are held together by interfacial forces. When relating this mechanism to the pharmaceutical sciences, mucous-adhesion describes the attractive forces between a biological material and mucus or mucous membrane.

Development and characterisation of a moisture-activated bio adhesive drug delivery system for percutaneous local anaesthesia. International 1998

A.David Woolfson,
Dermot F McCafferty,
Gary P Moss



Abstract

This study describes the design, formulation and characterisation of a moisture-activated device incorporating the tetracaine phase-change system for percutaneous local anaesthesia.

Gel intermediates for candidate devices were formulated with various concentrations of bio adhesive polymer, viscosity builder and tetracaine at pH values from 5 to 10.

Gels were cast onto a release liner, dried and a backing layer attached, thus forming a percutaneous anesthetic patch system. Patches were characterized by in vitro measurement of tetracaine flux through a polydimethylsiloxane barrier membrane, apparent viscosities of the casting gels, patch bio adhesion to a porcine skin substrate, uniformity of drug content and chemical stability of the active agent in the system.

The clinical efficacy of candidate formulations was evaluated by a volunteer trial. Patches were of a consistent appearance and exhibited a uniform thickness and drug distribution throughout the matrix.

Varying formulation parameters significantly ($p < 0.05$) affected drug release, patch viscosity and, thus, clinical efficacy. Tetracaine was stable in the patch system during storage for 6 months at 4 and 25°C.

Patches with lower concentrations of bio adhesive and thickener, formulated at pH 8 or above, demonstrated the highest levels of drug flux and provided optimum percutaneous anesthetic activity.

All volunteers reported complete cutaneous anaesthesia at the treated site, with a mean onset time for anaesthesia of 44±6.7 min.

The optimized bio adhesive patch device offered a more patient-compliant and convenient alternative to tetracaine percutaneous anesthetic gel, particularly where large areas of skin are to be treated.

PolyGlycerin:

Treatment of oral dryness related complaints (xerostomia) in Sjögren's syndrome.

Ann Rheum Dis 1999 Willy A van der Reijden, Arjan Vissink, Enno C I Veerman, Arie V Nieuw Amerongen

General:

Primary Sjögren's syndrome (SS) is a systemic autoimmune disorder characterised by a chronic, progressive loss of salivary and lacrimal function resulting in symptoms of oral and ocular dryness. The involvement of exocrine glands is the result of a focal, periductal mononuclear cell infiltrate and the subsequent loss of secretory epithelial cells. As a consequence, major changes occur in both the salivary flow rate and salivary composition. In the case of secondary SS a second autoimmune disease is involved, mostly rheumatoid arthritis.

The role of saliva in maintaining oral health and even quality of life is obvious in people who are lacking sufficient saliva. The effects of the reduced salivary flow rate (xerostomia) and changed salivary composition in SS are apparent: there are problems in eating, speaking, and swallowing and frequently disturbances in taste perception. In addition, reduced clearance of food, changes in microbial ecology and a reduced buffer capacity have their effects on oral health: an increased susceptibility to dental caries and oral infections are important clinical manifestations of the oral component of SS. When the systemic disease advances, salivary secretion declines further.

A reduction of the salivary flow rate below physiological values can be induced by several other

causes as well. Dry mouth symptoms are known as a side effect of more than 400 drugs. In most of these cases the level of reduction of the salivary flow is slight and can be compensated for by mechanical or gustatory stimulation.

Other common causes of prolonged hypo salivation include other autoimmune disorders such as systemic lupus erythematosus, uncontrolled diabetes mellitus and salivary gland injury as a result of radiotherapy in the head and neck region.

Conclusions:

The oral component is a main symptom in SS. However, the pathogenesis is not understood yet, and more research is needed to develop effective systemic treatments, both curative and symptomatic.

The treatment to relieve dryness related symptoms is mainly based on stimulation of the residual secretory capacity of the affected salivary glands and, if this is no longer successful, replacement of natural saliva with a saliva substitute. Worthwhile saliva substitutes contain a thickening agent to provide longer retention on the oral mucosa and biologically active compounds for the prevention of dental decay and (fungal) opportunistic infections. Such additions may support the optimal oral care that is a sine qua non.

New prospects are incorporation of antimicrobial compounds in saliva substitutes and mouth gels, and the ongoing research in gene therapy by integration of water channels into the ductal cells of the salivary glands to increase the secretory potency of these glands.

Immunomodulation using vaccination with attenuated T cells or T cell receptor epitopes has not been proved successful in a 100% of the patients with multiple sclerosis or RA tested but it will be the new challenge for treating auto-immune diseases.

