

# Loloz™ With Cavibloc™

## Scientific Literature Review

### October 2016

Loloz brand of lollipops and lozenges is the result of 7 years of research by a team of microbiologists at the UCLA School of Dentistry. The active ingredient in Loloz is Cavibloc, a patent-pending extract from a specific type of licorice root that targets and disables the recognized tooth decay causing organisms of Streptococcus Mutans, Sobrinus and Lactobacilli.

Short-term patient use of Loloz for just 10-days kills the bacteria that can lead to caries, suppressing their activity for 3 to 6 months.

This Scientific Literature Review is developed to provide you with the latest fair and balanced review of the product, the science and frequently asked questions. This will help insure that oral health professionals, and through them their patients, are as well informed as possible on this therapy.

The Food and Drug Administration classifies Loloz as a food product. This is the same designation as xylitol containing products like mints and gums.

This document is not assumed to contain all published information regarding licorice extracts, as that would be virtually impossible. It is however meant to provide a fair and balanced view of the benefits and risks of the use of Loloz. If after reading this document you have any questions please send an email to the address below and we will get back to you promptly.

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## Frequently Asked Questions

### *General*

#### **1. What's the active ingredient?**

Loloz cavity-fighting lollipops and lozenges uses Cavibloc, an all-natural, patented blend that is extracted from a specific licorice root. No man-made chemicals are used in Loloz lollipops or lozenges.

#### **2. What specifically is Cavibloc?**

Cavibloc is a patent-pending extract from the glycyorhiza glabra licorice root. This and other known extracts have been trusted remedies in traditional Chinese medicine for thousands of years. Since caries is a multi-factorial disease faced by patients, researchers sought to find a new bacterial suppressing therapy to adjunct current therapies like chlorhexidine gluconate 0.12% rinses, stannous fluoride and other anti-bacterial products.

#### **3. Are there any other benefits to taking Loloz?**

Licorice is used for various digestive issues including stomach ulcers, heart-burn, colic, and chronic gastritis. However, because Cavibloc is a single compound extracted from a specific type of licorice root (*Glycyorhiza glabra*), it is only proven to be effective as a caries prevention agent. Patients have also reported using Loloz for sore throat, bronchitis, cough, and infections caused by bacteria since Cavibloc inhibits *Streptococcus Mutans*, *Sobrinus* and *Lactobacilli*.

#### **4. How does it work?**

The exclusive blend of the licorice root in Cavibloc has been proven to kill the harmful bacteria that cause gum disease and tooth decay (*Streptococcus Mutans*, *Sobrinus* and *Lactobacillus*). As the patient uses Loloz more frequently, they possess fewer harmful bacteria.

#### **5. What is the impact of Loloz on the “good” bacterium in the oral cavity?**

Research from Dr. Wenyan Shi at UCLA found that Cavibloc acts like an anti-cavity smart bomb, in that it only disables and inhibits the harmful bacteria, leaving the healthy bacteria untouched.

#### **6. How is the action of Loloz different from that of the action of Xylitol from mints and gums?**

Research found that the specific licorice extract found in Loloz is bactericidal to *S. Mutans*, *Sobrinus* and *Lactobacilli*. These are the common bacteria associated with the caries process. The action of xylitol is different in that it inhibits acid production from these caries associated bacteria and is theorized to fatigue these bacteria through the process, but it does not kill the bacteria.

#### **7. How often should patients use Loloz?**

Directions for Use calls for 2X daily use of one (1) lollipop or lozenge, for ten

consecutive days. Recommended usage is in the morning and at night following tooth brushing. It is imperative the patient allows Loloz to melt in their mouth for at least five minutes. Patients determined to be high (D0603) and moderate (D0602) risk for caries should repeat the Loloz therapy at their recall appointments. For some that would be at three months and for others at six months.

**8. What kinds of results should I expect?**

There will be an immediate decrease in the bacteria that cause cavities, gum disease, and even bad breath.

**9. Can dry mouth sufferers benefit from the use of Loloz?**

Dry mouth is growing issue for many adults, especially older adults due to medically induced xerostomia (MIX) from a growing number of medications. All current caries risk assessment forms classify patients with dry mouth as either a moderate (D0602) or high risk (D0603) for caries. Loloz is an appropriate therapy for these patients. Additionally, dry mouth sufferers seek a long-lasting lozenge that is pleasant tasting, free of caries causing sugars and at a neutral pH. Loloz matches all of these needs.

**10. Will patients that dislike licorice not like Loloz?**

The process for extraction of the licorice root extract removes the licorice flavor. Three patient-friendly and tested flavors that both kids and grown-ups rated highly were chosen: orange, berry, and lemon.

**11. Would it be helpful to give an extra lozenge after the consumption of sugar or is it better to give only one in the morning and one in the evening?**

Yes, *S. mutans* increase after meals or sugar consumption. Post-eating/snacking and post-tooth brushing are good treatment periods for Loloz. Also *S. mutans* are most prevalent and damaging to tooth structure when patients sleep, due to decreased salivary flow. Thus, use just prior to bed is emphasized.

**12. Has this product been sold under a different name?**

Loloz is a re-engineered version of the original product called Dr. John's Cavity-fighting Lollipops. Moda Health bought the patent from a biotech firm and reformulated the product. All artificial flavorings and colorings were removed. Flavor choices were evaluated and expanded. Previously only orange flavor was offered. Next a lozenge was developed for adult application. Finally the efficacy of the extract was optimized through product development. Loloz now features three flavors, two delivery forms (lollipop and lozenge) and now contains no artificial additives.

***Safety and Precautions***

**1. Are there any risks?**

Loloz are 100% natural. There are no known risks from use of Loloz. This therapy is an adjunct to, not a replacement for, effective brushing, flossing, and twice-yearly cleanings and oral health exams.

**2. I've read that too much licorice and/or licorice root can cause adverse side effects?**

When used as directed, there are no concerns about side effects associated with overconsumption of licorice or licorice root. The amount of Glycyrrhizol A, the specific active extract from the licorice root used for Loloz, is provided in a very small per lozenge or lollipop dosage. It would take over 200 lozenges or lollipops daily to provide potentially unsafe levels.

Licorice root has been reported to be unsafe when used in very large amounts for more than 4 weeks of consecutive use. Loloz is different in that it contains only one of the compounds found in licorice. Also, each Loloz candy contains a small, yet effective amount of the targeted extract.

**3. Is it important to stop after 10 days or would it be even better to consume the lollipops/lozenges continuously?**

There are no known adverse effects on continuous use of Loloz brands. Since there is no known benefit to continuous use of Loloz, good pharmacokinetics dictates use limited to package instructions.

**4. Is Loloz gluten-free?**

Yes, Loloz lollipops and lozenges are gluten-free.

**5. Will Loloz help improve my breath?**

Yes, since Loloz helps kill cavity causing bacteria it also has an impact on odor causing organism that reside on the dorsum of the tongue, leading to volatile sulphur compound production. Combine Loloz with effective tongue cleaning and patients can control the most common causes of oral malodor.

## **Ingredients**

**Orange lollipops and lozenges:** Isomalt Syrup, Natural Flavor, Citric Acid, Cavibloc (Licorice Extract), Annatto and Stevia.

**Berry lollipops and lozenges:** Isomalt Syrup, Natural Flavor, Citric Acid, Grape Juice Extract, Caviloc (Licorice Extract) and Stevia.

**Lemon lollipops and lozenges:** Isomalt Syrup, Natural Flavor, Citric Acid, Turmeric, Caviloc (Licorice Extract) and Stevia.

**Why isomalt instead of sugar or other sugar free sweeteners?** A handful of research papers reported that isomalt facilitated tooth remineralization. (Primary research: Takatsuka T, Exterkate RA, Ten Cate JM. Effects of isomalt on enamel de- and remineralization, a combined in vitro pH-cycling model and in situ study. Clin Oral Investig. 2008; 12:173-177.)

## Studies

### **Antibacterial compounds from *Glycyrrhiza uralensis***

#### **From the Journal of Natural Products**

*Glycyrrhiza uralensis*, widely recognized as Chinese licorice, has been used in traditional medicine and naturopathy for thousands of years. In this study, several compounds isolated from *G. uralensis* were tested against *Streptococcus mutans*, a bacteria largely responsible for tooth decay. The study found that Glycyrrhizol A showed antibacterial properties against *S. mutans*, while Glycyrrhizol B and isoflavanoid gancaonin G also showed moderate antibacterial results.

**Read the complete study at <http://lolo.com/studies>**

### **Can a Licorice Lollipop Decrease Cariogenic Bacteria in Nursing Home Residents?**

#### **Research in Gerontological Nursing**

This population is particularly vulnerable to dental caries due to physical and mental limitations. Eight senior citizens were given at least one lollipop with licorice root extract per day for 21 days. Saliva samples were taken periodically throughout the study. In the end, the participants who consumed the lollipops more consistently had lower levels of *Streptococcus mutans* than the participants who occasionally missed a day. Those who consistently consumed two per day had even lower levels of *S. mutans* bacteria.

**Read the complete study at <http://lolo.com/studies>**

### **Effects of herbal lollipops on *Streptococcus Mutans* levels, *Lactobacilli* levels and the dental caries experience of children with asthma taking beta2-adrenergic drugs**

#### **From the University of Nebraska Medical Center**

The objective of this study was to determine how effective the six-month regimen of herbal lollipops is at controlling the *Streptococcus Mutans* levels, *Lactobacilli* levels, and the caries process in the study group. This study showed evidence that the herbal lollipops decrease bacterial levels in the oral cavity. A decrease in bacteria, aids in decreasing the caries process, which most children using a beta2-<sup>o</sup>©-adrenergic agonist would benefit from.

**Read the complete study at <http://lolo.com/studies>**

### **Clinical reduction of *S. mutans* in pre-school children using a novel liquorice root extract lollipop: a pilot study**

#### **School of Public Health, University of Michigan**

Pre-schoolers aged 2-5 years were given a lollipop with an active ingredient of *Glycyrrhiza uralensis* each morning and afternoon for three weeks. Of the 66 students who participated fully in the study, 12 were low-risk for future caries risk, 37 were moderate-risk and 17 were high-risk. The study found that high-risk children had a significantly reduced population of *Streptococcus Mutans* that continued for 22 days after the three-week course of lollipops were administered.

**Read the complete study at <http://lolo.com/studies>**

**Effectiveness of a Novel Delivery System on Salivary Flow Rate, Quality of Life, and Inhibition of Caries Microbiota in Sjögren's Syndrome Patients From the University of Toronto**

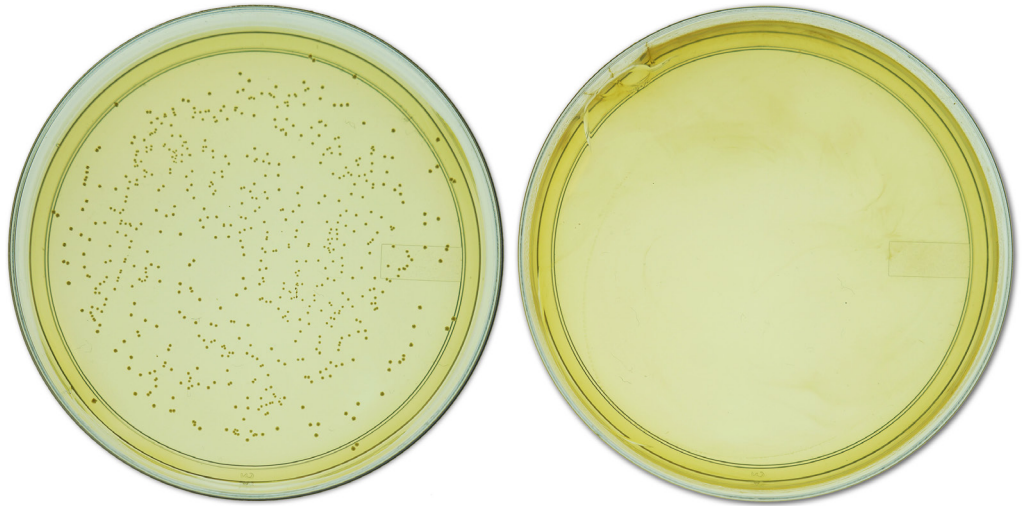
*Sjögren's Syndrome is an auto immune disease, marked by an occurrence of dry mouth and lack of saliva production. Patients with Sjögren's Syndrome were recruited, and instructed to consume two lollipops a day. Some contained xylitol, some contained licorice root extract, and some contained an artificial sweetener. The study has so far found that patients who used the lollipops increased saliva production even after the 10-day course, and some patients showed a lowered bacterial count.*

**Read the complete study at <http://loloz.com/studies>**



## Oregon Health Science University Study

These images were taken during a study at Oregon Health and Science University. Both plates contained *S. mutans* bacterial culture and underwent a 2-day incubation period. The image on the left is the control the image on the right contains Cavibloc. No growth was detectable on the THYE agar plates supplemented with Cavibloc extract. The Cavibloc-supplemented plates show that the extract completely inhibited *S. mutans* growth, rather than simply slowing its growth through partial inhibition.



**Without Cavibloc**

**With Cavibloc**

Study was conducted with *S. mutans* bacterial culture UA159 (a caries isolate) plated onto both unsupplemented and Cavibloc-supplemented THYE agar plates. The plates were incubated anaerobically for 48 hr at 37 Celsius. After the incubation period, the plates were photographed.