

## Review

# Comprehensive Review on Herbal or Medicated Toothpaste--A

## Review on Herbal v/s Medicated Toothpaste

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### **Abstract**

*A dentifrices are the products which are used for oral hygiene such as freshness of mouth and to avoid tooth decay. The oral hygiene can be maintained throughout the day by using various dentifrices prepared by herbal and medicated ingredient. A tooth is small, calcified, whitish, structure found in the jaws of many vertebrates and used to breakdown food. Teeth are not made of bone but rather of multiple tissues of varying density and hardness. Dentifrices contain ingredients that help reduce caries, plaque, gingivitis, hypersensitivity, calculus, slain, halitosis. Herbal toothpaste where no chemicals, preservatives are added; instead glycerin and common salt are added as natural preservative. This toothpaste can cure various diseases as teeth like gingivitis, tooth decay, cavity, gum bleeding, bad breath and dental caries as well as it has antismoking and anti cancer properties. While medicated toothpaste is a type of toothpaste that applies a medicine to the teeth, gum and mouth. Some medicated toothpaste require pacific application technique or a set duration of contact with the teeth, gums and mouth in order to provide a medical benefit. As the name suggest, these toothpaste have some medicinal properties. They are created pacifically to help in solving an oral health issues.*

### **Keywords**

*dentifrices, calcified, gingivitis, toothdacay, calculus*

### **1. Introduction**

Toothpaste is a paste or gel dentifrice used with a toothbrush to clean and maintain the aesthetics and health of teeth. Toothpaste is used to promote oral hygiene; it is an abrasive that aids in removing dental plaque and food from the teeth, assists in supressing halitosis, and delivers active ingredients to help prevent tooth decay and gum disease (gingivitis). Owing to difference in composition and fluoride content not all toothpaste are equally effective in maintaining oral health. The decline of tooth decay during the 20<sup>th</sup> century has been attributed to the introduction and regular use of fluoride-containing

toothpastes worldwide. Large amounts of swallowed toothpaste can be toxic. Toothpastes are generally useful to maintain dental health. Toothpastes containing fluoride are effective at preventing tooth decay. Toothpastes may also help to control and remove plaque build-up, promoting healthy gums. A 2016 systematic review indicated that using toothpaste when brushing the teeth does not necessarily impact the level of plaque removal. However, the active ingredients in toothpaste are able to prevent dental diseases with regular use. Since their introduction several thousand years ago, toothpaste formulations have evolved considerably - from suspensions of crushed egg shells or ashes to complex formulations with often more than 20 ingredients. Among these can be compounds to combat dental caries, gum disease, malodor, calculus, erosion and dentin hypersensitivity. Furthermore, toothpastes contain abrasives to clean and whiten teeth, flavors for the purpose of breath freshening and dyes for better visual appeal. Effective toothpastes are those that are formulated for maximum bioavailability of their actives. This, however, can be challenging as compromises will have to be made when several different actives are formulated in one phase. Toothpaste development is by no means complete as many challenges and especially the poor oral substantivity of most active ingredients are yet to overcome.

Multiple toothpastes have become available, which contain all the ingredients that would take care over gingivitis, tartar control and whitening of teeth. Tooth whitening is an important criteria for many of us. Toothpaste remove plaque, stains for which whitening abrasive particles on the toothpaste plays an important role. Currently the advances in the ingredients and additives to toothpaste offers some good clinical choices. In present study 10 different marketed brands of toothpastes were evaluated for various parameters like appearance, pH, spreadability, homogeneity, moisture content, heavy metals, anti-microbial activity and the result are compliance with the standards of BIS. Lastly all the brands of toothpastes taken for the study possess anti-microbial activity, the better activity was seen in Sensocheck-F and the Enshine when compared with the other brands, Sensocheck-F being a medicated toothpaste and it possess good anti-microbial effect to maintain oral hygiene. Even the herbal toothpastes like Vedshakti and Himalaya also have anti-microbial activity but it was less compared to medicated toothpastes.

#### A. ORAL HEALTH CARE PRODUCTS

Wide variety of oral health care products is available to consumers for over the counter(OTC) sale, and includes;

- Dentifrices (toothpaste, toothpowder)
- Toothbrushes
- Mouthrinses
- Interdental cleaning aids (dental floss)
- Denture cleansers and fixatives
- Saliva substitutes

Dentifrices and mouthrinses contain therapeutic agents designed to control various diseases and conditions of the mouth such as dental decay, gum diseases, tartar and tooth sensitivity. Toothbrushes

and the different interdental cleansers and accessories are primarily designed for the mechanical removal of plaque. There is still a sizeable market for denture cleansers and fixatives despite the fact that the number of people having teeth extracted has fallen considerably since the 1970s. Dry mouth is a problem for many people, particularly those in the older age bracket, hence the increasing market for saliva substitutes.

## **2. Dental Problems**

Dental problems are never any fun, but the good news is that most of them can be easily prevented. Brushing twice a day, flossing daily, eating properly and regular dental check-ups are essential steps in preventing dental problems. Educating your self about common dental problems and their cause can also go a long way in prevention. Here is a list of common dental problems.

### **Bad Breath**

Bad breath, also called halitosis, can be embarrassing and in some cases may even cause anxiety. Halitosis, is an unpleasant smell coming from mouth. Gum disease, cavities, oral cancer, dry mouth, and bacteria on the tongue are some of the dental problems that can cause bad breath.

### **Tooth Decay**

Tooth decay is damage to a tooth surface, or enamel. It happens when bacteria in your mouth make acids that attack the enamel. Tooth decay can lead to cavities (dental caries), which are holes in your teeth. If tooth decay is not treated, it can cause pain, infection, and even tooth loss.

### **Gum (periodontal) disease**

Gum disease, also known as periodontal disease, is an infection of the tissues that hold your teeth in place. It is typically caused by poor brushing and flossing habits that allow plaque- a sticky film of bacteria – to build up on the teeth and harden. In advance stages, periodontal disease can lead to sore, bleeding gums; painful chewing problems; and even tooth loss.

### **Oral cancer**

Oral cancer is cancer that develops in the tissues of mouth or throat. It belongs to a large number of cancers called head and neck cancers. Most develop in the squamous cells found in your mouth, tongue, and lips. Oral cancers are most often discovered after they have spread to the lymph nodes of the neck. Early detection is key to surviving oral cancer. The biggest risk factors are tobacco and alcohol use, including chewing tobacco.

### **Tooth Erosion**

Tooth erosion is the loss of tooth structure and is caused by acid attacking the enamel. Tooth erosion signs and symptoms can range from sensitivity to more severe problems such as cracking. Tooth erosion is more common than people might think, but it can also be prevented.

### **Gingivitis**

Gingivitis is a common and mild form of gum disease (periodontal disease) that causes irritation, redness and swelling (inflammation) of your gingiva, the part of your gum around the base of your teeth. The

cause is poor oral hygiene. Untreated gingivitis can lead to tooth loss and other serious conditions. Symptoms include gums that are swollen, puffy, receding, sometimes tender or that bleed easily. Treatment involves a professional cleaning as well as oral rinses.

### 3. Dentifrices

Dentifrices, including toothpowder and toothpaste, are agents used along with a toothbrush to clean and polish natural teeth. They are supplied in paste, powder, gel, or liquid form. Many dentifrices have been produced over the years, some focusing on marketing strategies to sell products, such as offering whitening capabilities. The most essential dentifrice recommended by dentists is toothpaste which is used in conjunction with a toothbrush to help remove food debris and dental plaque. Dentifrice is also the French word for toothpaste.

#### Types of dentifrices

Toothpaste is a dentifrice used in conjunction with a toothbrush to help maintain oral hygiene. The essential components are an abrasive, binder, surfactant and humectant. Other ingredients are also used. The main purpose of the paste is to help remove debris and plaque with some marketed to serve accessory functions such as breath freshening and teeth whitening.

#### Tooth powder

Tooth powder was historically used among the Romans to clean and whiten teeth, to fix them when loose, to strengthen the gums, and to assuage toothache. They made tooth powder from a variety of substances, such as the bones, hoofs, and horns of certain animals; crabs; oyster and murex shells; and egg-shells. These ingredients were reduced to a fine powder, sometimes after having been previously burnt.

#### Mouthwash

Mouthwashes come in a variety of compositions, many claiming to kill bacteria that make up plaque or to freshen breath. In their basic form, they are usually recommended for use after brushing but some manufacturers recommend pre-brush rinsing. Dental research has recommended that mouthwash should be used as an aid to brushing rather than a replacement, because the sticky resistant nature of plaque prevents it from being actively removed by chemicals alone, and physical detachment of the sticky proteins is required.

#### Tooth soap

Tooth soap cleans gums as well as fissures and pits in teeth using soap. The soap helps to remove oils, residue, and other contaminants. It is available in hard, liquid and gel.

### 4. Toothpaste and Its Ingredients

Toothpaste is a paste or gel dentifrice used with a toothbrush to clean and maintain the aesthetics and health of teeth. Toothpaste is used to promote oral hygiene; it is an abrasive that aids in removing dental plaque and food from the teeth, assists in suppressing halitosis, and delivers active ingredients to help prevent tooth decay and gum disease (gingivitis).

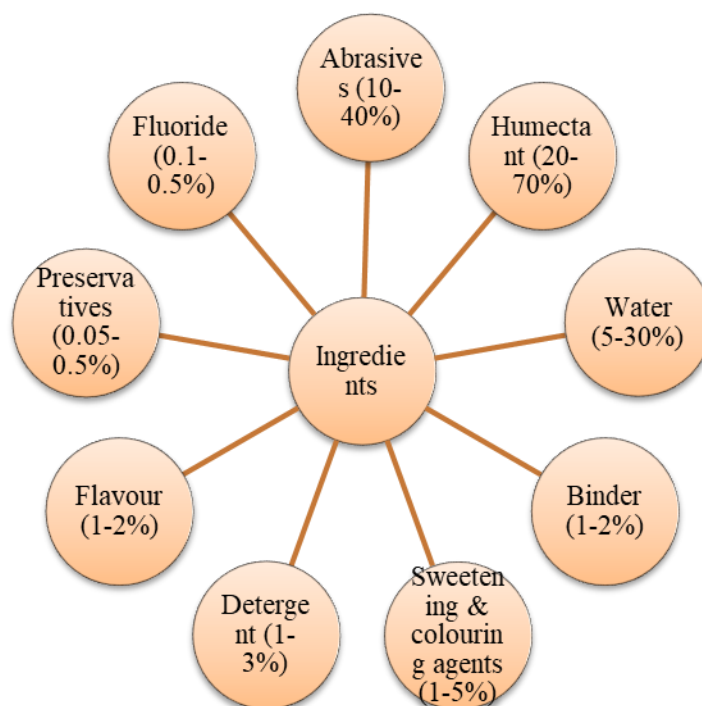
Type of toothpaste:-

(a). Herbal toothpaste – Herbal toothpaste is a toothpaste where no chemical preservatives are added; instead glycerin and common salt are added as natural preservatives. This toothpaste can cure various diseases of teeth like gingivitis, tooth decay, cavity, gum bleeding, bad breath and dental-caries as well as it has anti-smoking and anti-cancer properties.

(b). Medicated toothpaste – Medicated toothpaste is a type of toothpaste that applies a medicine to the teeth, gums and mouth. Some medicated toothpastes require specific application techniques or a set duration of contact with the teeth, gums and mouth in order to provide a medical benefit.

### What is in toothpaste?

The exact composition of a particular toothpaste varies with each manufacturer, but a typical formulation is –



### 5. Active Ingredients

The active ingredients are abrasives, fluorides, desensitizing agents, anti plaque agents, and antitartar ingredients.

- Abrasives perform the primary functions of removing plaque and stain from teeth.
- Common fluorides in toothpaste include stannous fluoride, sodium monophosphate fluoride, and sodium fluoride. Fluoride's primary action is to be incorporated into the tooth substrate (enamel and dentin) making the tooth more resistant to acid attack by cariogenic bacteria (oral bacteria). Fluoride is also bactericidal and has additional antiplaque effects.
- Desensitizing agents are active ingredients, usually potassium nitrate, in toothpaste that reduce dentin hypersensitivity through a depolarizing effect on the odontoblastic processes in the dentinal

tubules. The nerve endings of the odontoblastic processes then repolarize and have a reduced pain sensing ability.

- Antiplaque agents reduce plaque growth. This can have a positive effect in reducing plaque growth on teeth, reducing gingivitis, and potentially reducing caries. Some antiplaque agents include triclosan, papain, and sanguinaria extract.
- Antitartar ingredients that reduce calculus buildup on teeth include tetrapotassium pyrophosphate, tetra sodium pyrophosphate, disodium pyrophosphate, papain and citroxaine.

## 6. Inactive Ingredients

Toothpaste also contains inactive ingredients like detergents, humectants, thickeners, preservatives, flavouring agents, sweeteners, coloring agents and water.

- Detergents are responsible for the foaming action of toothpaste. Sodium lauryl sulfate, the most widely used detergent in toothpastes, has been reported to cause adverse effect on oral soft tissues. SLS in toothpastes significantly increased incidence of desquamation of the oral mucosa compared with toothpastes containing the detergent cocoamidopropyl-betaine (CAPB). Detergent also referred to as soap, foaming agents, or surfactants. They are used to remove compounds that have varied properties such as oil and water.
- Humectants provide toothpaste texture and help the toothpaste maintain its moisture. Some common humectants in toothpaste are glycerine, sorbitol, and water. Xylitol is also a humectants.
- Thickeners are added to a toothpaste to provide body to the toothpaste. Some thickeners are carrageenan and xanthan gum.
- Preservatives prevent growth of microbes in the toothpaste. Some common preservatives used in toothpastes are methyl paraben and sodium benzoate.
- Flavoring agents are added to improve the taste of toothpastes. They can range from minty flavors to fruity flavors. Commonly used flavorings are peppermint, cinnamon, and menthol.
- Sweeteners also improve the taste of toothpaste. Most toothpaste sweeteners are artificial and are not able to be used by carcinogenic bacteria. Examples of sweeteners are xylitol, calcium or sodium saccharin.
- Coloring agents are added to provide toothpastes with a pleasing appearance. Examples of coloring agents are red, green (D&C #5), and blue. Titanium dioxide is used to make toothpaste white.

**Table 1. Formulation Excipients Used in Toothpaste**

S.no.	Excipients	Concentration	Types	Uses
1.	Abrasives	9-13%	Dicalcium phosphate, Alumina, calcium carbonate	Remove food debris, stains as well as polishes the tooth surface
2.	Humectants	37-45%	Glycerol, Xylitol, water,	Provide moisture content and prevent formation of plug-in nozzle tube.
3.	Binding Agents	0.8-2.5%	Agar, Carrageenan, Gum tragacanth, Isapgol mucilage	Stability and consistency of the toothpaste can be maintained
4.	Preservatives	0.05-0.5%	Formaldehyde, Benzoic acid, Parabens, Phenolics, citric acid.	Prevents growth of micro-organisms and provide stability
5.	Foaming agents	1-2%	SLS, Sodium stearyl lactate, Amine fluorides, Dioctyl sodium sulfosuccinate	Assist in penetration of plaque deposition and enables dispersion
6.	Flavors	1-6%	Cloveoil, aniseed, Peppermint, Eucalyptus, fennel, Spearmint	Key constituents that impact on consumer acceptability
7.	Colors	1-2%	Titanium dioxide, chlorophyll	Impart colour to the toothpaste
8.	Sweeteners	18-24%	Saccharine, Aspartame, Sorbitol, xylitol	Mask palatable taste

**(A) Herbal toothpaste**

Herbal toothpaste is a toothpaste where no chemical preservatives are added; instead glycerin and common salt are added as natural preservatives. This toothpaste can cure various diseases of teeth like gingivitis, tooth decay, cavity, gum bleeding, bad breath and dental-caries as well as it has anti-smoking and anti-cancer properties.

Formulation containing natural ingredients is more acceptable in the belief that they are safer than synthetic drugs. Herbal toothpaste containing natural ingredients like Neem stem and bark, Acacia

leaves, Guava leaves, Cinnamon bark, Camphor etc. Which were traditionally used for tooth cleaning. Calcium carbonate, Sorbitol, Silica, Sodium Lauryl sulphate, Polyethylene Glycol, Sodium carboxymethyl cellulose, Sodium monofluorophosphate, sodium saccharin, myrrh extract, Tea tree oil, Sodium silicate, Xanthan, Chamomile, Echinacea, sage, rhatany, myrrh.

It is made from herbs, barks, roots and flowers, no artificial ingredients or sweeteners, no harsh abrasives fluoride just the best ingredients for dental care.

Herbal toothpastes, at least the ones on retail shelves in India, cater to the demand of consumers who want 'natural' alternatives to chemical based products. There is not much difference in the texture or consistency of the herbal toothpastes when compared to conventional toothpastes, and are different mainly in colour and flavor. Most herbal toothpastes do not look pristine white, but have range of colours and also tend to taste rawer and less sweet. However, herbal toothpastes should ideally not contain any unnatural chemicals, dyes or artificial flavours and preservatives. These ingredients should not be treated with growth hormones, chemicals or pesticides.

Advantages of Herbal toothpaste:-

- Natural toothpastes use natural ingredients like mint and other herbs to freshen your breath. They are free of artificial flavoring and dyes. Many natural toothpaste use natural ingredients like hydrated silica to whiten teeth, which is gentler on your teeth than artificial bleaching agents found in common toothpastes.
- Natural oral care products are effective in removing bacteria and keeping the entire mouth healthy.
- Peppermint and spearmint oils are present in herbal toothpaste which helps in destroying the bacteria.
- Gives a effective protection and long life to teeth and gums by making them healthy.
- Fights against dental problems like pyorrhea, bleeding and swollen gums, sensitivity and yellowing of teeth.
- Makes a natural protective shield around the teeth and gums to fight against germs for 24 hrs. To help to protect teeth from bacteria.
- The antibacterial action produced by the herbs present in the toothpaste helps to get rid of the infective organisms.

Disadvantages of Herbal toothpaste

- Safest product of herbal toothpaste that which is certified as organic otherwise they may also endanger our tooth.
- It should not contain cinnamon and any artificial chemicals and dyes.

Some examples of herbal toothpastes:

Brands name:-

1. Patanjali Dantkanti
2. Dabur Meswak
3. Vicco Vajradanti toothpaste



4. Dabur Red
5. Dabur Babool
6. Colgate Herbal white
7. Dant Jeevan toothpaste
8. Herbodent Premium
9. Himalaya Herbal Complete Care
10. Bentodent toothpaste
11. Ayush Freshness Gel toothpaste
12. Colgate Swarna Vedshakti Toothpaste
13. Dr. Jaikaran's Herbodent Sensitive toothpaste
14. Dr. Jaikaran's Thermodent Sensitive Herbal toothpaste
15. Himalaya Herbals Sparkling White Toothpaste
16. Dabur Herb'L Neem toothpaste
17. Biotique Micro Clove Action toothpaste
18. Dabur Dant Rakshak toothpaste

#### Action of herbal toothpaste

Herbal dentifrices are as effective as non-herbal dentifrices in the control of plaque and gingivitis. Dental plaque deposit on teeth is a concern for both cosmetic and its pathogenic nature. Presence of plaque may be the culprit for dental caries, gingivitis, periodontal problems, and halitosis. Many mechanical aids are used worldwide to remove or control plaque, including tooth brushes, dental floss, mouth rinses, and dentifrices. Mechanical plaque removal is one of the most accepted methods of controlling plaque and gingivitis. But it is expected that less than one-third of the population can effectively perform mechanical plaque removal. Several chemical preventive agents have beneficial effects in the control of plaque and to reduce or prevent oral disease. Hence, various chemical formulations were tried in dentifrices. Chemicals, mainly triclosan and chlorhexidine, have been added in mouth rinses and dentifrices to prevent plaque and gingivitis. But some of these substances show undesirable side effects such as tooth staining and altered taste. This had led to paying increased attention on using natural ingredients in herbal dentifrices. Herbal ingredients have several benefits neem has anti – bacterial property, myrrh is a natural antiseptic property, chamomile has anti – inflammatory effect, sage and rhatany have anti hemorrhagic property, peppermint oil has analgesic, antiseptic, and anti inflammatory properties.

**Table 2. Herbs Used in Dentistry**

S.no.	Herbs	Chemical constituents	uses	References
1.	Aloevera	Aloin, flavonoids, sterols, aminoacids, aloeride.	Used in treatment of mouth ulcer, Denture adhesive, Osteitis	20
2.	Chirata	Swertanone, Swertianin, Swerchirin	Decreases increased level of Proinflammatory cytokines	21
3.	Clove	Gallic acid, oleanolic acid, Ellagic acid	Control of gingivitis, halitosis, Plaque	22
4.	Guduchi	Alkaloids, tannins, phenols, Glycosides	Used in treatment of aggressive and chronic periodontitis	23,
5.	Turmeric	Curcuminoids, demethoxycurcumin, bisdemethoxycurcumin	Antibacterial agent, relief from gum inflammation.	24,25
6.	Green Tea	epicatechin	Suppresses	26
7.	Triphala	Consist of thiamin, riboflavin, ascorbic acid, galloyl glucose, chebulinic acid	Anti oxidant, anti microbial properties. It is use in ulcerated and bleeding gums as well as in dental caries	27
8	Citrus medica	Citric acid, hesperidin, diosmin, eriocitrin	Used to treat scurvy, bleeding gums due to rich Antioxidant potential	28

**(B) Medicated toothpaste**

Medicated toothpaste is a type of toothpaste that applies a medicine to the teeth, gums and mouth. Some medicated toothpastes require specific application techniques or a set duration of contact with the teeth, gums and mouth in order to provide a medical benefit.

Toothpaste is an effective way to apply medicine to the teeth, mouth and gums when treating certain diseases or conditions in those areas. Common conditions for which medicated toothpaste are typically prescribed include bacterial and fungal infections, cavities, gingivitis, root exposure, dry mouth, enamel demineralization, lesions, and furcation (bone loss).

Most medicated toothpastes have specific instructions on their labeling or packaging that describe how to use the toothpaste. Some medicated toothpastes require specific application techniques or a set duration of contact with the teeth, gums and mouth in order to provide a medical benefit. Some medicated toothpastes require a specific periodicity of use, or should not be used too often, in order to

maintain a healthy mouth. Medicated toothpastes will have instructions detailing all risks, side effects, warnings, and specific instructions for use. The medical professional who prescribes the medicated toothpaste will also be able to explain the purpose of the toothpaste and how to integrate it into a healthcare treatment plan for a medical condition or disease.

Medicated toothpaste may be brand-name or generic, Over-the-Counter (OTC) or prescription only. Medicated toothpaste will typically not qualify for reimbursement.

Advantages of Medicated toothpaste:-

- Helps whiten teeth
- Promotes healthy gums
- Helps prevent and remove tooth stains.
- Helps prevent gingivitis
- Helps remove plaque from teeth
- Helps prevent tartar build-up
- Dental hypersensitivity
- Dental Caries
- Gum inflammation

Disadvantages of Medicated toothpaste:-

- Staining of tooth.
- Itching or rash.
- Peeling of skin.
- Gum irritation.
- Excessive salivation.
- It has some side effects such as Oral discomfort, swollen tongue, oral pain, swollen tongue.

Some examples of Medicated toothpastes:

Brands name:-

1. Sensodyne Sensitive Toothpaste
2. Thermosteal
3. Thermodent
4. Thermokind F
5. Colgate toothpaste
6. Close Up
7. Pepsodent
8. Oral – B
9. Desent
10. Dentrox
11. Dentogard
12. Parodontax

13. EMOFORM-R
14. Glister Multi Action toothpaste
15. Sensoform toothpaste
16. Colgate strong teeth
17. Colgate Cavity Protection toothpastes

#### Action of medicated Toothpastes

Approximately one out of every eight adults experiences tooth sensitivity. Technically termed “dentinal hypersensitivity”, this condition leads to short, painful sensations in one or more teeth, usually caused by hot, cold or sweet stimuli.

This leads many to seek relief from their sensitivity in the toothpaste aisle at their local grocery or drugstores. Sensodyne is the most popular anti-sensitivity toothpaste on the market. Sensodyne earned its reputation as the go-to toothpaste for sensitivity because of the effectiveness of its active ingredients.

Pepsodent toothpaste fights germs to protect teeth against cavities and gives strong teeth, fresh breath and healthy gums. Pepsodent as an oral care expert offers solution to specific problems like bleeding gums and sensitive teeth. White system. With Lamella that contains Perlite, a professional polishing ingredient, removes stains and polishes enamel for whiter teeth that stay white.

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