

Study on Formulation and Evaluation of Herbal Toothpaste

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Abstract: *Due to its safety and effectiveness in preventing dental caries and other dental issues that this generation is prone to, the public now views the use of herbal toothpaste containing natural ingredients as more acceptable in oral dental care than synthetic formulations based on chemicals. We use ingredients in this formulation that have not previously been used in any other study endeavor, including trikatu, neem powder, clove oil, and aloe vera gel.*

A number of botanical components with antibacterial, antiseptic, and cooling qualities were used to make the toothpaste. The perfect herbal toothpaste is made with neem, clove, babool, banyan, amla, and many other natural ingredients that fulfill all the requirements to keep the mouth feeling fresh and to stop bacteria-caused tooth decay. The trituration procedure is the one utilized to formulate the herbal toothpaste. To make sure the prepared toothpaste had every quality needed to combat dental illness, its organoleptic and physical characteristics—such as color, odor, taste, stability, foamability due to bacteria, and abrasiveness—were assessed. Because of this, the herbal toothpaste that was created was superior to the regular toothpaste in terms of effectiveness

Keywords: Herbal toothpaste, oral hygiene, oral care, neem

I. INTRODUCTION

Herbal and herbal-based toothpaste has been used in ancient life for many years and is one of the most significant aspects of oral health care. The manufacture and development of toothpaste formulations dates back to 300-500 BC in China and India. During that time, abrasives such as squashed bone, crumbled egg, and clam shells were used to clean teeth. In the nineteenth century, modern toothpaste compositions were created.

Dental caries is the microbial infectious disease. In recent years it is the most common health problem in the world. It is chronic disease which destroyed the tooth tissue and affect chewing and asthetic appearance.

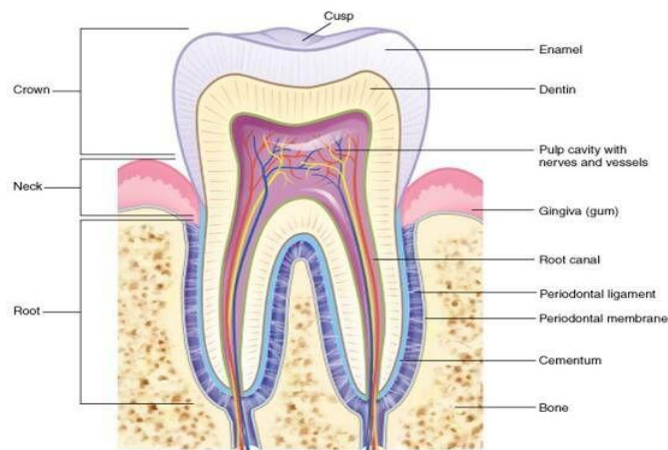
There are many herbal available in market and herbal toothpaste is one of the product.

Herbal toothpaste is having advantages over commercial products. This study also contain the advantages and disadvantages of herbal toothpaste.

Toothpaste is generally used for cleaning of teeth and mouth. It is also used to treat many disorders of teeth. Many dentists recommend to use toothpaste to treat disorder like sensitivity, Chronic gingivitis etc. Herbal toothpastes can be prepared using different herbal extract of many crude drugs having antibacterial, antimicrobial activity. Herbal formulation of toothpastes is by prepared using herbs like Neem leaves, Turmeric, Clove oil, Betel etc.

Toothpastes are the most common preventive means in oral health care. Many commercially available dentifrices claim to have antimicrobial properties, but little research has been conducted to investigate these claims. Therefore, this study was conducted to evaluate the efficacy of different toothpaste formulations in reducing the oral microbial load

ANATOMY OF TEETH



IMPORTANCE OF HERBAL TOOTHPASTE

Herbal toothpaste is a wise and healthier choice for those who would like to minimize the amount of chemicals that could potentially endanger general health.

Herbal toothpaste contains natural antibacterial ingredients such as neem, clove, turmeric, etc. These help to eliminate bacteria and keep the mouth healthy.

"Study on Formulation and evaluation of herbal toothpaste"

OBJECTIVES

- To prevent the microbial growth in teeth.
- To be useful in toothache and cleaning of teeth.
- The aim of this study was to evaluate the antimicrobial potential of herbal toothpaste against various oral microorganisms.
- The neem has been antimicrobial activity is has evaluated from the ancient times. It has been used to prevent the astringent,
- antiseptic, insecticidal, anti-ulcer and for cleaning the teeth and other dental
- disease.
- The herbal toothpaste formulated which can satisfy all the required conditions to keep the mouth fresh and prevent tooth decay by bacteria.
- Toothpaste is used to promote oral hygiene

COMPOSITION OF HERBAL TOOTHPASTE

- Ingredients
- Abrasive, surfactant, Fluoride
- Clove, Neem, peppermint, betel, Turmeric, etc.

Abrasive

In a normal toothpaste, abrasives make up 8–20%. The purpose of these insoluble particles is to assist in cleaning teeth of plaque. By preventing the buildup of tartar (calculus), the elimination of plaque reduces the risk of gum disease. Particles of calcium carbonate (CaCO_3), magnesium carbonate (MgCO_3), sodium bicarbonate, different calcium hydrogen phosphates, different silicas and zeolites, and hydroxyapatite ($\text{Ca}_5(\text{PO}_4)_3\text{OH}$) are examples of representative abrasives.

Fluoride

The most often used and successful active component in toothpaste to prevent cavities is fluoride, which can be found in a variety of forms. Fluoride can also be found in trace levels in plants, animals, and some natural water sources. The development of dental enamel and bones benefits from toothpaste's added fluoride. While sodium fluoride (NaF) is the most widely used source of fluoride, stannous fluoride (SnF₂) and sodium monofluorophosphate (Na₂PO₃F) are also utilized. Studies have shown that toothpastes containing stannous fluoride are more effective than toothpastes containing sodium fluoride at reducing dental caries and dental erosion, as well as gingivitis, at similar fluoride concentrations. Moreover, some stannous fluoride-containing toothpastes contain ingredients that improve stain and calculus removal.

In addition, several clinical trials have demonstrated that gluconate chelated stannous fluoride toothpastes offer superior protection against dental erosion and dentine hypersensitivity compared to other fluoride-containing and fluoride-free toothpastes. A systematic review found that stabilised stannous fluoride-containing toothpastes had a positive effect on the reduction of plaque, gingivitis, and staining, with a significant reduction in calculus and halitosis compared to other toothpastes.

Surfactant

Not all toothpastes, although a lot of them do, contain surfactants, or detergents similar to sodium lauryl sulfate (SLS). SLS is primarily used as a foaming component in many other personal care products, including shampoo, to enable toothpaste to be distributed uniformly and increase its cleaning efficacy.

Flavorants

Toothpaste is available in a range of flavors and colors to promote product use. Wintergreen, spearmint, and peppermint are the three flavorings that are most frequently used. In the Mediterranean region, toothpaste flavored with peppermint-anise oil is quite popular. The corresponding oils, such as peppermint oil, supply these flavors. Anethole anise, apricot, bubblegum, cinnamon, fennel, lavender, neem, ginger, vanilla, lemon, orange, and pine are some of the most unusual flavors. As an alternative, flavorless toothpaste is available.

Ingredients:

Honey:

Honey is known to have various antibacterial properties that help inhibit the growth of bacteria in your mouth. Moreover, it has hydrogen peroxide that acts as an antiseptic for the pain caused by the sensitivity. It also acts as a barrier, contributing to the preventing of infections in the mouth.



CLOVE:

Synonym: Lavang

Biological source: Dried flower buds of eugenia caryophyllus Family: Myrtaceae

Use: use in effective treatment for toothache, tooth care



NEEM

Synonym: melia azadirachta

Biological source: it consist of leaves and other aerial part of azadirachta indica Family: Meliaceae

Use: toothache reliver, cleaning of teeth antibacterial property



TURMERIC

Synonym: Curcuma longa

Biological source: it is the dried rhizome of curcuma longa linn. Family: Zingiberaceae

Use: antiinflamatroy, coloring agent



PEPPERMINT

Synonym: mentha piperita

Biological source: volatile oil obtained by the steam distillation of the fresh flowering tops of mentha piperita

Family: Labiatae **use:** flavouring agent



BETEL

Synonym :Betelpeper Biological Source: leaf of Betel Family:Pipercea
Use:Gum irritatioaction and tooth Decay



Types of toothpaste

There are variety types of toothpaste toothpaste for children, herbal toothpaste, whitening toothpaste, fresh breath toothpaste, anti plaque toothpaste.

Toothpaste for children:

These kinds of toothpaste are specially created for children. They have pleasant flavours and come in attractive colours. These toothpastes contain no sugar and have low concentration of fluoride to prevent causes fluorosis.

Herbal toothpaste:

Herbal toothpastes are made from natural ingredients and some are certified as organic. Now a day many consumers have started using natural toothpaste in order to avoid synthetic and artificial flavours which are commonly found in natural toothpaste. They don't contain any artificial flavours or chemicals, It is good choice for people who allergic to mint or to sodium lauryl sulphate, a foaming agent that is included in most commercial toothpaste brands.

Whitening toothpaste:

These toothpastes contain special ingredient such as hydrogen peroxide for teeth bleaching and whitening. The peroxides deliver oxygen radicals to enamel. According to American Dental Association (ADA) because it acts as bleaching agent, hydrogen peroxide actually changes the colour of the enamel on the surface of the teeth by cleaning the extrinsic stains that discolour the outside of the tooth. Tooth whitening toothpaste have higher abrasive value than normal toothpaste to remove food and other stains.

Fresh breath toothpastes

These are most popular toothpaste in the market. They contain enhanced flavouring agent with antibacterial agent to help fight against halitosis

Anti-plaque toothpaste:

Anti-plaque agent reduces plaque growth. This can have a positive effect in reducing plaque growth on teeth, reducing gingivitis and potentially reducing caries

OTHER HERBS USE IN HERBAL TOOTHPASTE

Herbs used in herbal toothpaste

Turmeric: A daily intake of turmeric about half a teaspoon reduces the growth of false DNA patten.

Aloe Vera: Aloe Vera may be effective in the treatment of gum wounds.

Peppermint: Pepper-mint is used in flavouring agent.

Mint leaf: Mint is used for dental care because of its genocidal and freshening properties.

Small cardamom: It helps to produce smoky flavour. It disinfects the oral cavity the germs and drives away bad breath

Clove: Cloves are also said to be a natural anthelmintic. The essential oil is used in aroma therapy,

Lemon peel: Contains high amount of vitamin C Orange peel: Contains high amount of vitamin C

Banana peel: Vitamin A and B rich in banana has Antioxidants

Pumpkin peel: Pumpkin is found having zinc content that is really good for skin, Mango peel: It has been recommended as a drug in preventing dental plaques Papaya peek: Papaya has antibiotic, antifungal, anti-microbial, anti-inflamatory. Pumpkin peel: Pumpkin is found having zinc content that is really good for skin, Mango peel: It has been recommended as a drug in preventing dental plaques.

Jack fruit seed: Jack fruit seed contains vitamin A. C. B. The seeds contain minerals like calcium, zine and phosphorus that strengthen the teeth

FORMULATION

A method used for the formulation of herbal toothpastes homogenization by using mortar and pestle forthe formation base of toothpaste

All the required materials for making the herbal toothpaste were collected Each ingredient was dried completely and powdered.

The powdered herbal ingredient was weighed accurately as per the need

The ingredients were mixed with chemicals such as polyethylene glycol is used as humectant and asolvent to form a base for the preparation

The herbal powder and the base ingredients were added to the mortar and pestie, and stevia powder was added as a sweetening agent.

The herbal ingredients are triturate well until paste consistency is formed

An equal proportion of all the ingredients (Neem, Clove, Betel Nut,Peppermint oila nd Honey) were dried and converted into powder

Along with the herbal powder add a sufficient quantity of Polyethylene glycol, water, and sodium lauryl sulfata and moxed well to get the herbal toothpaste.

EVALUATION

The sensory evaluation parameters of herbal toothpaste is evaluded their color, odour, taste and observe dark brownish, heavy aromax, spiky, biter, and subtly sweet is described in the below

Sr.no	Parameter	Observation
1	Colour	Dark Greenish
2	Odour	Heavy Aromatic
3	Taste	Spicy,Beter,And noemarmal Sweet

One herbal toothpaste brand and its advantage and disadvantage. Dabur is a must-trusted and original herbal product. It has all the ingredients which help us in avoiding tooth disease. It refreshes the breath, cleans the teeth and prevents the gum disease. It is made from herbal stem and flower, not the artificial ingredient. It also contains vajradanti which actually means diamond teeth. It also does not use any sugar.



Advantage:

No body wants that their body is full of chemicals. So, we must go for natural alternatives available in the market. At least it saves our tooth from decay. There are many advantages of herbal toothpaste. Commercial toothpaste contains sodium Lauryl toothpaste which can cause irritation and inflammation while doing the brush. But in case of herbal toothpaste there is no chemical ingredient. Natural oral care products are effective in removing bacteria and keep the mouth healthy. Peppermint and spearmint oils are present in herbal toothpaste which helps in destroying the bacteria.

Disadvantages:

Safest products 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.

USEFULNESS

In general, toothpaste helps to keep teeth healthy. Fluoride-containing toothpaste works well to stop tooth decay. Toothpastes may also support healthy gums by reducing and eliminating plaque accumulation. According to a 2016 systematic review, the amount of plaque removed from teeth does not always depend on the toothpaste used. On the other hand, consistent usage of toothpaste's active components can help prevent dental ailments.

DISCUSSION:

The study has shown that herbal toothpaste does not cause any adverse effects on the oral cavity and are effective in reduction of plaque, inflammation, etc.

II. CONCLUSION:

Teeth are the stronger and hardest part of the human body, maintaining good oral hygiene is crucial. To keep our mouths clean and free of microorganisms, we use toothpaste on a daily basis. Given that herbs have a wide range of medicinal characteristics for a wide range of illnesses, the current review includes a variety of herbs utilized in the manufacture of dentifrices. Herbal toothpaste is thought to be generally safe, easily accessible, and have comparable anti-microbial and good abrasive properties to conventional toothpaste. The use of herbal toothpaste is essential in the management of a number of dental conditions, including gingivitis, caries, and plaque. Therefore, it is determined that it is necessary to identify and elucidate the structure of the bio active components responsible for the antibacterial activity against various microbes.

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