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A REVIEW ON: HERBAL TOOTHPASTE

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ABSTRACT
A paste or gel dentifrice which is used to clean and maintain aesthetics and health of teeth with the help of a toothbrush is called toothpaste. Toothpaste is one of the most important parts of oral hygiene. Oral care products have been used for long time, with people in China and India creating toothpaste formulas as early as 300 to 500 BC. Dentifrice is a type of toothpaste used to clean and protect teeth, which promotes oral health. Herbal medicine refers to the use of plants to heal and treat diseases. Herbal remedies have been used extensively throughout history, with around 80% of the world's population relying on them for healthcare. Toothpaste is an essential part of oral hygiene, as it helps protect, clean, and polish teeth. Toothpaste is a product that is usually utilized by everyone. Typically, toothpaste is used to clean the mouth and enamel. It is also used to treat a variety of enamel problems. Toothpaste excipients are essential for increasing the cleaning process even if the mechanical action of toothbrushes is essential for proper cleansing. This investigation seeks to assess herbal toothpaste formulations and compare them to three popular commercial toothpaste products.
KEYWORDS: *Herbal Toothpaste, Guava Leaves, Turmeric, Herbal ingredient, Camphor*

INTRODUCTION

A paste or gel dentifrice which is used to clean and maintain aesthetics and health of teeth with the help of a toothbrush is called toothpaste. Toothpaste is one of the most important parts of oral hygiene. Oral care products have been used for long time, with people in China and India creating toothpaste formulas as early as 300 to 500 BC. Dentifrice is a type of toothpaste used to clean and protect teeth, which promotes oral health. Herbal medicine refers to the use of plants to heal and treat diseases. Herbal remedies have been used extensively throughout history, with around 80% of the world's population relying on them for healthcare. There are more than 35,000 different plant species used in medicine worldwide, with some of them having powerful anti-bacterial, anti-viral, anti-cancer, and anti-fungal properties **(1)**. Toothpaste is an essential part of oral hygiene, as it helps protect, clean, and polish teeth. Brushing your teeth twice a day with a toothpaste is a great way to keep your mouth clean and healthy. A study was conducted to evaluate the effects of natural toothpaste on gum health and oral hygiene **(2)**. Herbal toothpaste is rich in active chemical ingredients such as polyphenols, gums, alkaloids, and glycosides. Herbal toothpastes have proven to be highly effective and have a wide range of biological activities. Research on herbal toothpastes has led to the development and availability of new herbal toothpaste formulations. The purpose of this comparative study is to evaluate and compare the efficacy and benefits of herbal toothpastes with commercially available toothpastes **(3)**.

The advantages of using Herbal Toothpaste are manifold:

- Prevention of dental diseases.
- Thorough cleaning of teeth.
- Stimulation of breath freshness.
- Effective prevention of gum disease.
- Herbal Toothpaste, crafted from natural ingredients like ayurvedic herbs, natural oils, minerals, and herbal extracts.
- Consistent use of Herbal Toothpaste proves beneficial in addressing various dental issues.
- Notably, herbal toothpaste is associated with minimal to no side effects, adding to its appeal as a natural and safe oral care option **(4)**.



Fig 1. Herbs and species good for teeth

The creation and assessment of herbal toothpaste is the main objective of the study. Toothpaste is a product that is usually utilized by everyone. Typically, toothpaste is used to clean the mouth and enamel. It is also used to treat a variety of enamel problems. Numerous dentists suggest using toothpaste to treat conditions like chronic gingivitis, sensitivity, etc **(5)**. Herbal toothpaste offers an alternative by avoiding artificial colors, flavors, and fluorides commonly found in conventional products. Building upon this

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premise, this research aims to formulate a poly-herbal toothpaste and investigate its antimicrobial properties **(6)**. Over the past decade, herbal remedies have gained popularity worldwide for both prevention and treatment of various ailments. These herbal medicines are often chosen for their perceived safety, as they tend to mitigate the side effects associated with traditional medicines **(7)**.

These alternatives encompass dental products with natural ingredients and herbal formulations. Previous studies have demonstrated that dental plaque control can be achieved through physical removal and the use of pharmaceutical products like antimicrobial toothpaste and mouthwashes. **(8)** As a means of both treating and preventing oral problems, toothpaste composition has recently turned its emphasis to maximizing the release of active chemicals. The major functions of toothpaste, also known as dentifrice, are oral hygiene maintenance and improvement. It serves as an abrasive substance that aids in the removal of food particles and dental plaque from teeth as well as a method of promoting oral hygiene. Toothpaste also helps to cover up or get rid of halitosis and contains active ingredients like fluoride to help prevent dental and gum problems like gingivitis. **(9)**

Toothpaste excipients are essential for increasing the cleaning process even if the mechanical action of toothbrushes is essential for proper cleansing. This investigation seeks to assess herbal toothpaste formulations and compare them to three popular commercial toothpaste products. **(10)**

Now a days people are more inclined towards the use of non-alcoholic and herbal formulation because it does not contain artificial color, flavor, or fluorides as it has several drawbacks. **(11)** During that period, they attained good abrasives action with their formulated tooth powder which was further converted into toothpaste. Proper oral hygiene should be maintained otherwise it will cause several dental problems like cavities, tooth sensitivity, calculus, and periodontal disease. Herbal toothpaste is referred to as an oral hygienic product to maintain the health of teeth. **(12)** Natural or herbal toothpaste lack triclosan or fluorides and other artificial chemical ingredients which overcome the side effects like carcinogenic action as it mostly contains plant-based ingredients such as lemon, eucalyptus, rosemary, chamomile sage, and myrrh. **(13)**

The main purpose of toothpaste is to reduce oral bacterial flora and deliver fluoride to the teeth. This is because fluoride has been proven to protect teeth against attack from bacteria and can be found naturally in many everyday things including food and Drinkwater. Toothpaste that efficiently reduces oral bacterial flora should contribute to dental health. Triclosan is usually used in gum. It is a constituent used to avert gum disease because of its antibacterial properties. The active ingredient sodium fluoride is also known to have antibacterial properties natural toothpastes are those without triclosan or fluoride. They usually contain natural ingredients such as special mineral salts. **(14)**

Formulation containing natural ingredients is more acceptable in the belief that they are safer than synthetic drugs. In present study formulated herbal toothpaste was evaluated for its organoleptic and physical properties such as Colours, odour, taste, pH, spread ability, moisture content, fineness, foamability etc. as per standards specified by Bureau of Indian Standards and compare with commercially marketed toothpaste formulations. The results of the evaluating parameters show the promising results as compare to marketed formulations. Hence the lab made herbal toothpaste was found to be of good quality. **(15)**

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.
- Mouth rinses.
- Interdental cleaning aids (dental floss).
- Denture cleansers and fixatives.
- Saliva substitutes **(16)**.

Mouth rinses and dentifrices contain medicinal ingredients intended to manage a range of oral health issues, including tooth sensitivity, gum disease, tartar, and dental decay. The main purpose of toothbrushes, various interdental cleansers, and accessories is to mechanically remove plaque. Denture cleaners and fixatives continue to have a sizable market even through the number of dental extractions has significantly decreased since the 1970s. Many people suffer from dry mouth, especially those in their later years, which is why the market for saliva substitutes is growing **(17)**.

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 yourself about common dental problems and their cause can also go a long way in prevention. Here is a list of common dental problems **(18)**.

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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 **(19)**

Gum 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 **(20)**.

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 then 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 **(21)**.

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 **(22)**.

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 **(23,24)**.

Toothpaste
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) **(25,26)**.

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 **(27)**.

Active Ingredients in toothpaste
The active ingredients are abrasives, fluorides, desensitizing agents, anti-plaque agents, and ant tartar ingredients.
 Abrasives perform the primary functions of removing plaque and stain from teeth.

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 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 **(28)**.

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 **(29)**.

Formulation containing natural ingredients is more acceptable in the belief that they are safer than synthetic drugs. Herbal toothpaste containing natural ingredients like, Guava leaves, turmeric, clove, Camphor etc. Which were traditionally used for tooth cleaning **(30)**.

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 Guava Leaves has anti-Ulcer property, turmeric has anti-microbial property, camphor has anti-inflammatory effect, peppermint oil has analgesic, antiseptic, clove has anti-cancer effect **(31)**.

Ideal Properties of Herbal Toothpaste

1) Strong abrasive action.
2) Non-toxic and non-irritating
3) Leave no stains on the teeth
4) Maintain a healthy and clean mouth
5) Long-lasting impact
6) Accessible and affordable
7) The oral fluid and tissue shouldn't be harmed.
8) It must not discolor teeth.
9) To remove dental shrine.
10) To stimulate appetite to give a sense of well-being.
11) To maintain the healthy state of mouth, epoxies, teeth and epoxies
12) To help goo inflammation and infection **(32)**.

Benefits of Herbal Toothpaste

Bacteria in your mouth can cause gum disease and other dental issues. Using natural toothpastes, you can get rid of your oral bacteria without using harmful chemicals. To clean your breath, natural toothpastes use natural ingredients like mint and herbs.
Cleans your teeth safely.
Effectively refreshes your breath.
Prevents and calms gum pain.
Stain Remover. Safe for children **(33)**.

Objectives of Herbal Toothpaste

1. The plant extract ingredient has antibacterial properties.
2. The formulation of an herbal toothpaste that can satiate every prerequisite for maintaining oral hygiene and preventing bacterial tooth decay **(34)**.

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Advantages of Herbal Toothpaste

1. Simple to use.
2. The ADA has approved numerous products.
3. Fluoride may be present to prevent cavities.
4. No one wants their body to be filled with chemicals, and even toothpaste sold in stores contains these harmful substances. To prevent tooth decay, we must use the natural alternatives that are already available. Herbal toothpastes provide a lot of benefits.
5. Sodium laurel sulphate, a component of commercial tooth paste, can irritate and inflame the gums while brushing. But there are no chemical ingredients in herbal toothpaste.
6. Natural oral care products work well to get rid of bacteria and maintain a healthy mouth.
7. Herbal toothpaste contains peppermint and spearmint oils, which aid in killing bacteria.

Disadvantages of Herbal Toothpaste:

1. Organically certified herbal toothpaste is the safest option; otherwise, our teeth could potentially be endangered.
2. It shouldn't include cinnamon or any synthetic chemicals or dyes.
3. May originate from producers who aren't honest about their business operations or who don't adequately label substances, including fluoride, which some people find concern.
4. Long-term use of excessive amounts of fluoridated toothpaste can cause fluorosis.
5. If toothpaste is ingested in any amount continuously, it can be acutely poisonous of toothpaste has been found to be the real culprit in the development of some conditions, including tooth sensitivity and enamel thinning.
6. Chloroform, a human carcinogen, is created when the active ingredient in many toothpastes, triclosan, combines with the chlorine in tap water.
7. According to some scientists, it can cause brain damage to unborn children **(35)**.

MATERIAL AND METHOD

Herbal Extract:

The herbs used in present formulations and their typical Role in toothpaste.

Herbs	Effect
Guava Leaves	Anti-ulcer
Clove	Anti-cancer effect
Peppermint	Anti-viral effect
Calcium carbonate	Abrasive
Sodium lauryl sulphate	Foaming Agent
Turmeric	Anti-microbial agent
Camphor	Anti-inflammatory

Table 1: Information on herbs used in toothpaste formulations.(36)

Ingredients Use in Herbal Toothpaste

1) Guava Leaves powder:



Fig. Guava Leaves Powder (37).

Guava leaves is a special medicinal plant in that all of its parts, including its leaves, seeds, fruit, can be used. This is why it is sometimes referred to as "the village pharmacy."

Scientific Name: Psidium guajava L.

Uses:

- Guava helps boost your immunity.
- May reduce the risk of developing Cancer.
- Helps to manage blood sugar levels.
- Guavas help in keeping your heart healthy.
- Helps during constipation.

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 Helps in better eyesight.
 Guava is an anti-stress agent.
 Guava helps women during pregnancy **(37)**.

2) Clove:



Fig. Clove (38)

Scientific Name: Syzygium aromaticum.
Uses
 To aid in the destruction of microorganisms as an antibacterial.
 As a painkiller for ailments like toothaches and muscular pain.
 For upset digestion.
 To treat respiratory issues like asthma and cough.
 To increase bone vigour.
 Relieve sore throat and cough.
 Control blood sugar.
 Seizures, liver damage, and fluid imbalances are side effects.
 Bleeding disorders: The component eugenol found in clove oil appears to inhibit blood coagulation.
 In those who have bleeding issues, taking clove oil may result in bleeding **(38)**.

3) Peppermint



Fig: Peppermint (39)

A mix of spearmint and water mint, peppermint is a species of mint. Red gum, menthol, peppermint gum, liquor ice are all synonyms.
Scientific Name: Mentha piperita L.
Uses:
 The common cold, sinus infections, headaches, irritable bowel syndrome (IBS), and other digestive issues.
 The topical use of peppermint oil to the skin is recommended for treating conditions like headache, muscle aches, joint discomfort, and itching.
 It lessens tension.

Negative Effect
 Oral consumption of peppermint oil can cause heartburn, nausea, abdominal pain, and dry mouth. Rarely, allergic responses might be brought on by peppermint oil.
 To lessen the possibility of heartburn, enteric coating is frequently used on capsules containing peppermint oil **(39)**

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4) Calcium Carbonate



Fig: Calcium Carbonate (40)

Uses:

- When the amount of calcium consumed through food alone is insufficient, calcium carbonate is used as a dietary supplement.
- The body needs calcium for strong bones, muscles, a healthy neurological system, and a healthy heart.
- In addition to being an antacid, calcium carbonate is used to treat stomach discomfort, heartburn, and acid indigestion.
- Symptoms include a troubled stomach.
- Vomiting.
- A stomachache Belching.
- Constipation.
- Mouth arid Increased urination and appetite loss.

5) Sodium lauryl sulphate



Fig: Sodium lauryl sulphate (40)

It is an anionic detergent and surfactant that is used in many personal care products (such as soaps, shampoos, toothpaste, etc.) as well as for industrial purposes.

Uses:

- Cleaning agent emulsification in home cleaning products (laundry detergents, spray cleaners, and dishwasher detergents).
- Foaming agent.
- Surfactant.

Negative Effect

- Chronic toxicity
- Eye irritation When used in high concentrations or provided neat as a raw ingredient, SLS, like most chemicals, can irritate the eyes.
- Skin irritation
- Oral poisoning **(40)**.

6) Turmeric



Fig: Turmeric (41)

Scientific Name: Curcuma longa.

Uses:

- Inflammation.
- Degenerative eye conditions.

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- Metabolic syndrome.
- Hyperlipidemia (cholesterol in the blood)
- Anxiety.
- Muscle soreness after exercise.
- Kidney health.
- Anti-microbial agent.

7) Camphor



Fig: Camphor (41)

Scientific Name: Cinnamomum camphora.
Uses:

- It may show antiseptic activity.
- It may have antipruritic (used to relieve itching) property.
- It may have analgesic (relief from topical pain) property.
- It may show anti-inflammatory activity.
- It may demonstrate expectorant (secretion of sputum) property **(41)**.

Method of Preparation of Herbal toothpaste
Trituration Method
The multi-herbal toothpaste was made using all the collected herbal extracts (powders). A computerized weighing balance was used to weigh the ingredients precisely. Then, in increasing order of their percentage, the weighed herbal powders of Guava leaves, clove, turmeric, peppermint, and camphor were added to the mortar. Afterward, using a pestle, properly triturate the mixture. After that, calcium carbonate, and sodium lauryl sulphate are added and thoroughly mixed. Then, demineralized water is added to the powder combination to create a paste-like consistency, and the trituration process continues until a thick paste is produced **(42)**.

Evaluation of Herbal Toothpaste
PH Determination
The pH was determined. 100 ml of distilled water were used to dilute 1 gm of produced herbal toothpaste, and one drop of the diluted paste was added. Was applied to pH paper, and the colour shift was assessed using a standard colour strip. The pH is then noted.

Viscosity
Using a Brookfield viscometer, the viscosity of each toothpaste formulation was determined, First the created toothpaste formulation was stored in a narrow mouth container, and the spindle of the Brookfield viscometer was submerged inside of it for two minutes. Using a Brookfield viscometer with a number 64 spindle and 100 rotations per minute, the viscosity of all the manufactured Multi herbal toothpaste was measured. To determine the average viscosity of the formulations, dial readings were taken three times. The results were then reported.

Foamability
One gram of dental paste was placed in a stoppered test tube and the liquid's volume was increased by 10 ml with water. The tube was stopped and shaken for the desired length of time at a rate of two shakes per second. 15 minutes of standing time was given, and the height of the foam created was measured **(43)**.

Fragrance Test
The test was based on personal observations. Five people's opinions on whether or not the fragrance was acceptable were taken into consideration. The fragrances were evaluated according to the following:

A) The scent is comparable to that of a reference toothpaste.
B) B) The smell is not overpowering, but it is comparable to the reference toothpaste's scent.
C) C) The toothpaste's aroma is not as good as that of the reference toothpaste.

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Homogencity
Toothpaste must be forced out of the collapsible tube (or any other suitable container) by applying normal pressure. Most of the contents must protrude from the container's crimp before being slowly rolled out.

Moisture Content
Weighted toothpaste (10 gramme) was placed in a porcelain plate and dried in a 105°C oven. It was desiccated to chill it. The percentage moisture content loss is calculated using the provided formula. % Moisture = Dry sample weight – Original sample weight
Original sample weight and weight

Stability
The stability study was carried out according to ICH guidelines.
The paste was put into a collapsible tube. The paste was stored for 3 months at various temperatures and humidity levels (25 °C, 2 °C, 60 °C, 65 °C, and 5 °C). Spread ability, pH and appearance were also evaluated **(44)**.
Determination of abrasiveness:
Once the material is about 15-20 cm long, extrude it onto the butter paper. To make at least ten collapsible tubes, repeat this process. Using the tip of your finger, scan the length of the contents for any hard-edged or sharp abrasive particles. These particles are not allowed in toothpaste.

Determination of Spread Ability
The spreadability of the product is assessed using the following procedure: Place a product on the glass plate in the Centre. Next, carefully install a second plate on top of it and add 1 kg of weight to the setup's highest point. Remove the after some time has passed, then gauge the diameter in cm.

Extrudability
Using this method, the ready paste was put inside a collapsible aluminum tube, sealed with a standard cap, and the end was crimped shut. The weight of the tubes was recorded. After the tubes were positioned between two glass slides, they were clamped. The cover was removed from the slides after 500g had been added. We measured and collected the volume of the extruded paste. The amount of paste that was extruded was calculated **(45)**.

Future Prospective
The herbal toothpaste has good scope in the future by increasing natural ingredients for manufacturing more and safer natural remedies, in the research and health of dental care of public, society and nation.

CONCLUSION
Herbal toothpastes have an emphasized role in maintaining the oral hygienic nature as well as preventing dental caries. The formulated poly-herbal toothpaste was successfully evaluated using different standard parameters including antimicrobial properties. The extract showed promising antimicrobial effects against both organisms. The formulated toothpaste may be safer compared to fully synthetic toothpaste. Herbal toothpaste was equally efficacious as marketed popular toothpastes in terms of all evaluation properties of toothpaste. The formulated herbal toothpaste has good scope in the future by increasing natural ingredients for manufacturing more and safer natural remedies, in the research and health of dental care of public, society and nation. The created herbal toothpaste was found to be of high quality. The trituration process was used to create a multi-herbal toothpaste that contained Guava leaves, peppermint, clove, turmeric.

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44. *Review on formulation and evaluation on Herbal Toothpaste by Mr. Sable Kundan 1 ,Mr. Bhati Deepak2, Mr. Havelikar Ujwal3 Mr. Ghuge Saurabh Dr. Thorat Rajendra.*
45. *Review on formulation and evaluation on Herbal Toothpaste by Prabhu K. Halakatti*1, Anita Desai1, Mahantesh Moogi2, Mahantesh Patted2, Ashok Gumtaj2, Pallavi Jakati.*