



COMPOSITION AND ANALYSIS OF HERBAL TEETHPASTE

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Abstract :

Most people use toothpaste as part of their regular dental hygiene regimen. Although cleaning teeth and the mouth is toothpaste's main function, it also helps with a number of dental disorders. Most people use toothpaste as part of their regular dental hygiene regimen. Although cleaning teeth and the mouth is toothpaste's main function, it also helps with a number of dental disorders. Modern toothpaste compositions were developed in the nineteenth century. Toothpaste has long been considered an essential part of good oral hygiene. People in ancient China and India began creating toothpaste recipes between 300 and 500 BC. Another term for toothpaste is dentifrice, which is used to protect and clean teeth while promoting good oral hygiene. Herbal medicine uses plants to treat and cure diseases. Herbal medicines have long been utilized for medical purposes and are relied upon by about 80% of the population. Worldwide, more than 35,000 plant species are utilized for therapeutic purposes; certain of these species are especially useful in combating cancer, viruses, bacteria, and fungi. Comparing and evaluating the herbal toothpaste with commercial toothpaste is the goal of this study. This study shows that, when compared to commercially available herbal formulations, the effectiveness of our herbal-based toothpaste formulation with natural constituents is comparable.

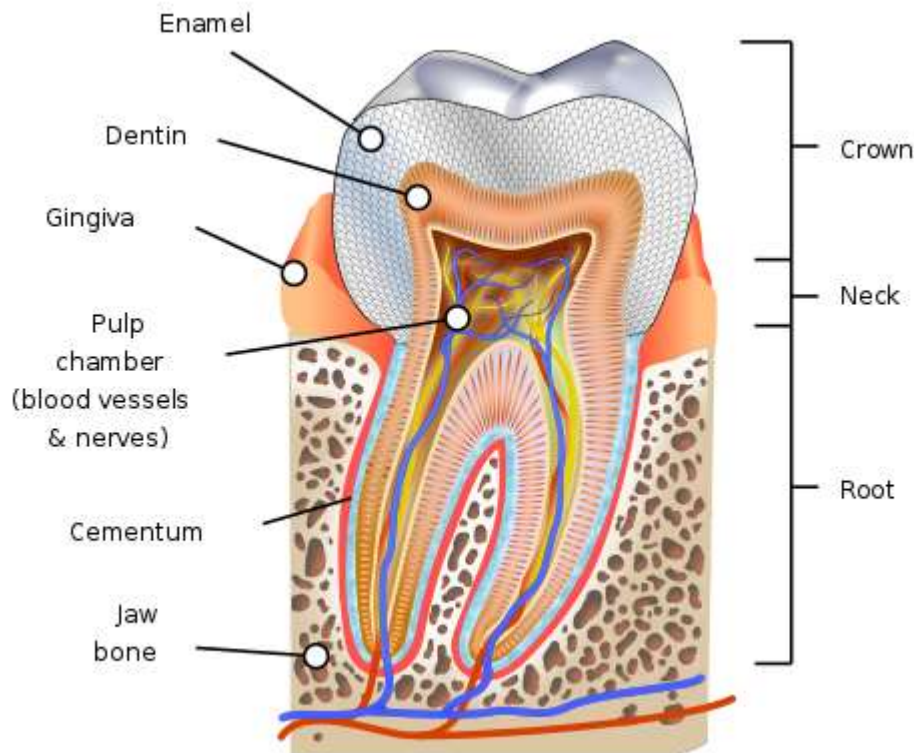
KEYWORDS: Oral hygiene sensitivity, herbal toothpaste, ginger, Dentrifices

INTRODUCTION:

Ancient people have used herbal and herbal-based toothpaste for a very long time.(1) and is among the most crucial elements of dental health care.(2) Between 300 and 500 BC, toothpaste formulations were first manufactured and developed in China and India. Smashed bone, ground egg, and clam shells were used as abrasives in tooth cleaning procedures during that time. (3)The nineteenth century saw the development of contemporary toothpaste formulas. Toothpaste has long been a necessary component of dental hygiene. Between 300 and 500 BC, people in ancient China and India were developing toothpaste formulas. Dentifrice, another name for toothpaste, is used to clean and protect teeth while fostering good oral hygiene. Plants are used in herbal medicine to treat and cure illnesses. Approximately 80% of people rely on herbal remedies for healthcare, and they have been used extensively throughout history. More than 35,000 plant species are used medicinally worldwide; some of these species are particularly effective against bacteria, viruses, cancer, and fungi. (4)The chemical agent reduces and prevents oral disease and has the potential to replace patient-dependent mechanical plaque control. Performing mechanical plaque removal on oneself is a widely recognized approach to managing plaque and gingivitis. The mechanical plaque control takes a lot of time, and some people might not be motivated to do these operations.(5) Plants have been known to have medicinal effects on dental health for thousands of years, all around the world. Traditional medicine has more benefits than drawbacks, such as allergic reactions.

One of the tropical trees whose development therapeutic function has been studied the most is neem. The component of neem extract was examined twenty years ago.(6)

ANATOMY OF HUMAN TEETH :



The 32 teeth that make up the human mouth are permanently embedded in the mandible, the lower jaw, and the maxilla, the upper jaw's alveolar edge. Human teeth are divided into several categories. ▪ Shavers ▪ Dogs ▪ Molar ▪ Pre-molar The tooth is composed of three main sections: the crown, neck, and root. Three materials make up a tooth: dentine, enamel, and cementum (7,8)

❖ IDEAL PROPERTIES:

- No stain on teeth
- Long lasting freshness
- Non-toxic
- Non-irritant
- Good abrasive action
- Cheap
- Pleasant flavour
- Easily accessible
- Fewer adverse effects (9)

❖ ADVANTAGES:

1. Traditionally, toothpaste has been used mainly for cosmetic purposes, such as helping to clean teeth and freshen breath.

2. Toothpaste helps prevent tooth decay and gingivitis, which can result in more serious dental problems.
3. Toothpaste helps to freshen your breath and mouth after brushing and is available in a variety of flavors. Additionally, it can cover up the smells of strong-flavored dishes like onions or garlic.
4. It should meet the requirements of the European Community Cosmetic Directive, which declares that, when used as directed, it poses no risk to human health (10,11)

❖ MATERIAL AND METHOD:

One formulation of herbal toothpaste is made with a variety of ingredients, such as pomegranate peel for its anti-inflammatory properties, neem powder for its antimicrobial properties, calcium carbonate as an abrasive, sodium fluoride as an anti-caries agent, sorbitol as a humectant, sodium lauryl sulphate as a detergent and foaming agent, sodium CMC as a binding agent, methyl paraben and sodium benzoate used as a preservative, sodium saccharine as a sweetening agent, and peppermint oil as a herbal toothpaste formulation. This created composition is assessed and contrasted with herbal toothpaste that is sold. Homogenization with a mortar and pestle to generate the toothpaste base is one technique utilized in the formulation of herbal toothpaste.

Diagram:



❖ FORMULATION :

Using a home mixer, all herbal ingredients were dried and pulverized. The necessary amount of ingredients was measured out and placed in a mortar. In water, methyl cellulose, calcium carbonate, sodium lauryl sulfate, honey, and glycerine were combined. To the mixture mentioned above, acacia were added. This mixture was gradually put to a mortar that already included herbal ingredients, and it was thoroughly triturated to create a paste-like consistency.(12)

Serial no.	Components	Number %
1	Ginger extract	2ml
2	Sodium lauryl sulphate	1.5gm
3	Sodium benzoate	0.1gm
4	Glycerine	40gm
5	Calcium carbonate	44gm
6	Pepper mint oil	Qs
7	Sodium saccharine	0.2gm

FORMULATION:

- Polishing Agents / Abrasive Agents:

These substances are used to clean teeth and get rid of food particles that have stuck to their surface. They make up between 20% and 50% of the formulation overall when used in this concentration (13).

- Surfactants and foaming agents: These are often referred to as wetting agents. The cleansing action's process involves decreasing the surface tension at the point where the tooth enamel and adhering substance meet (14).

- Humectants: Dentifrices are kept from drying out too quickly by the use of humectants. They stop the product from losing too much moisture. They might also provide the finished product some flexibility. The humectant percentage in the formulation might range from 20% to 40%(15).

- Ceiling/Binding Agents: The purpose of the binding agents is to preserve the properties of the solid and liquid components by holding them together to form a smooth paste, especially during storage. In addition to increasing the final formulation's body and viscosity, they stop the paste from bleeding(16).

- Flavouring Agents: To satisfy customer preferences, flavouring agents may be the most important and proprietary component of the formulation. Typically, they are a blend of edible volatile oils with peppermint and spearmint oil serving as the main ingredients.

- Preservatives: Preservatives are added to products during formulation to prolong their shelf life and preserve their qualities during storage. Preservatives that include 5% methyl paraben and 0.02% propyl paraben are often the most widely used and effective combination (17)

- ❖ Method of formulation:

- There are two different approaches used to formulate toothpastes: the dry gum method and the wet gum method.

Dry Gum Method:

Setting Up the Base:

1. To maintain the particle size, the solid ingredients (calcium carbonate, sodium fluoride, SLS, sodium CMC, methyl paraben, sodium benzoate, and sodium saccharine) were precisely weighed in accordance with the formula and sieved via sieve no. 80.

2. In addition, these substances were mixed in a mortar and pestle and then triturated with precisely weighed sorbitol to make a semisolid mixture. Including herbal compounds
3. Powders of precisely weighed herbal extract were sieved and added to the base, along with clove oil and aloe vera gel.
4. As a last-minute flavoring, peppermint oil was applied. (18,19)

❖ INGREDIENTS OF TOOTHPASTE :

- Lauryl sulfate (SLS) sodium :

a combination of sodium dodecyl sulphate and other alkyl sulphates. It is a powder or crystal that is white or pale yellow in color and has a faint, distinct smell. Water-soluble at room temperature; somewhat soluble in alcohol (20). It is a potent denaturing agent with a high affinity for proteins. Unsuitable for use with acids that are less than pH 2.5 and cationic compounds. Skin and mucosa may become irritated by sodium lauryl sulphate. Additionally, by denaturing the glycoproteins in the mucosal mucus layer, it may cause harm (21).

- Sweeteners :

Sweeteners provide mouthwashes and toothpastes a moderate, sweet flavor as well as an improved taste. The sweeteners that are most frequently used are glycerol, sorbitol, and sodium saccharin. Another sweetener that has anti-caries properties is xylitol. Preservatives stop microorganisms from growing in mouthwashes and toothpastes. Sodium benzoate, methylparaben, and ethylparaben are the most common ones.

❖ EVALUATION INDICATORS:

- Features of the Body: (22)
- hue: The toothpaste's visual appearance is assessed for uniformity and conformance to the desired hue.
- Odor: The toothpaste's fragrance is evaluated.
- Taste: To make sure the flavor is agreeable and meets expectations, it is tested.
- Foaming Ability:

This section looks at how well toothpaste creates foam when brushing, which enhances the whole brushing experience.

• A little amount of the toothpaste was combined with water in a measuring cylinder to determine its foamability, and the initial volume was noted. The mixture was shaken ten times before the final volume of foam was measured. Foaming power = $V1 - V2$, where $V1$ is the volume of foam with water in milliliters and $V2$ is the volume of water alone in milliliters, is the formula used to determine the froth power.

- Abrasive Properties: (23)

- The toothpaste's abrasiveness is evaluated to ascertain how well it cleans teeth without endangering them.
- Using butter paper, squeeze the mixture into a strip that is 15-20 cm long. Continue this process until at least ten collapsible tubes are created. To check for any hard or sharp abrasive particles, gently rub your fingers along the full length of the toothpaste; it should be clear of such particles.

- pH measurement: :

A tiny quantity of herbal toothpaste is combined with distilled water to measure the pH of the resulting mixture. This can be done with a pH meter or pH indicator strips. The toothpaste's acidity or alkalinity is indicated by its pH value, which also offers information on the toothpaste's possible effects on oral health and safety.

- Microbiological

Analysis:

- To make sure the toothpaste satisfies hygiene requirements, it is tested for microbiological contamination.
- To determine the total aerobic bacterial count, a known dilution of the sample is plated on soybean agar and incubated for a predetermined amount of time to form visible colonies.
- To identify Salmonella and E. Coli, the process entails culturing the bacteria in an appropriate culture medium, incubating the selected culture medium, and streaking the bacteria on agar plates.

❖ CONCLUSION:

The formulator must use a range of different components in order to achieve the multi-claim goods required for the dental care category. This puts the development process under a lot of pressure. Pharmaceutical technology advancements have aided in the development of medications with improved efficacy and other qualities that could improve patient acceptability and clinical response. Better patient compliance with oral hygiene should be encouraged by conditioning signals, improved clinical efficacy, and acceptability, which will further support professional efforts aimed at disease prevention.

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