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Formulation and Evaluation of Herbal Mouth Wash

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Abstract: *The importance of mouth and teeth cleanliness has been recognized from the earliest days of civilization to the 21" century. Patients and oral health practitioners are faced with a multitude of mouthwash products containing many different active and inactive ingredients. Making informed decisions as to the suitability of a particular product for a particular patient can be complex task. Although many popular herbal products have helped to control dental plaque and gingivitis, they have been used for a short time and only as an adjunct to other oral hygiene measures such as brushing and flossing. Natural mouthwashes may offer significant advantages over the chemical ones. If such mouthwashes can be formulated which can be easily prepared and used safely by people at home using natural products, it may leads to improvement in the general dental health of the population. In this study the various natural ingredients and materials are used. Then the thin layer chromatography was done to check the quality of materials used. Then the physical evaluation, ph determination, stability study, thin layer chromatography, antimicrobial study was studied. By this study it was concluded that the developed herbal mouthwash possess significant, therapeutically efficacious, suitable vehicle for drug delivery in low cost but definitely with high potential. Hence there is need for increased usage of herbal preparation to avoid the adverse effects. This study is an attempt to outline such natural substances, which may be used as effective mouthwashes.*

Keywords: Herbal, Mouthwash, Gingivitis, Antimicrobial.

I. INTRODUCTION

The meaning of **MOUTHWASH** is a usually antiseptic liquid preparation for cleaning the mouth and teeth or freshening the breath. Mouthwashes are often prescribed in dentistry for prevention and treatment of several oral conditions. In the recent times the use of naturally occurring products what is otherwise known as grandmothers remedy are used on a large scale. This has now called for a newer age of mouth washes but is the new age mouth washes at par with the gold standard or even better than them this study investigates.

Spices as clove, oregano, mint, they me and cinnamon, have been employed for centuries as food preservatives and as medicinal plants mainly due to its antioxidant and antimicrobial activities. Nowadays, many reports confirm the antibacterial, antifungal, antiviral and anticarcinogenic properties of spice plants. Clove in particular has attracted the attention due to the potent antioxidant and antimicrobial activities standing out among the other spices.

Across the world, oral health is becoming a major concern. The world oral health report,2003, highlighted oral health as an integral and essential component of general health. Most of the chemical products contains an antiseptic that plays an important role in controlling plaque accumulation. The vehical for delivery of chemical agents with antiplaque action are toothpaste, mouth washes, spray, irrigators, chewing gums and varnishes. However, mostly accepted method of delivering the antimicrobial agents after toothpaste is mouth wash. Mouth wash are an antiseptic solution which is used to reduce the microbial load in the oral cavity.

Mouth washes are liquids which contains anti-inflammatory, Anti-microbial and analgesic action. There are two types of mouthwashes- chemical and herbals Herbal mouthwash contains a natural ingredients called phytochemicals that contains desired anti-microbial and anti-inflammatory effects. Herbal mouthwash becomes more popular they work without alcohol, artificial preservatives, flavours and colors. As it contains natural herbs that have natural cleansing and healing property to teeth and gums. Many herbal mouthwashes contain herbs with antimicrobial property such as neem,

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yavanisatva, nagavali, gandhapurataila, pilu, bibhitaka, ocimum, Echinacea, chameli leaves, etc. some of the herbs that are used in mouthwashes are clove, which is traditionally used for oral health because of their antiseptic, antibacterial and antiviral property, peppermint which gives cooling effect to the mouth. Natural Herbs such as Triphala, Tulsi, Neem, Clove oil, Pudina and many others are used as single or in combination have been Scientifically Proven to be Safe and Effective Medicine against Oral Health Problems such as Bleeding Gums, Mouth Ulcers, and Preventing Tooth Decay without side effects.

Almost all chemical mouthwashes contains alcohol and fluoride which is toxic to our body in overdoses. Hence, most herbal mouthwashes are safe alternative to pregnant women, peoples with dry mouth, diabetic and to children.

The purpose of this study was to determine the prevalence of mouthwash use and not only the type of mouthwash but quantity of mouthwash to be taken for use is also important and also this study was performed to evaluate the efficacy and safety of herbal mouthwash for human medicines.

ComplexometricTitrations.Various kinds of mouthwashes have evolved following oral hygienic problems.

But apart from this, mouthwashes also serve to refresh breath. Moreover, mouthwash also contains some ingredients that serve as digestive aids. Mouthwashes can be chemical or herbal in nature.

Cetylpyridinium chloride (CPC) is a cationic quaternary ammonium compound in some types of mouthwashes, toothpastes, lozenges, throat sprays, anti-sore throat sprays, breath sprays, and nasal sprays. It is thus a type of chemical mouthwash. It is an antiseptic that kills bacteria and other microorganisms. It has been shown to be effective in preventing dental plaque and reducing gingivitis [1]. But it has certain disadvantages. It is combustible. Concentrated solutions are destructive to mucous membranes. It is toxic when swallowed and very toxic when inhaled.

Another chemical alcohol free mouthwash consists of sodium chloride, sodium bicarbonate, a flavoring agent and as a solubilizing agent here for, polysorbate 20, being a mixture of partial lauric esters of sorbitol and its mono- and di-anhydrides copolymerized with approximately 20 mol of ethylene oxide for each mol of sorbitol and its anhydrides; and water, said sodium chloride and sodium bicarbonate being dissolved in said water and present in a suitable quantity to produce a solution substantially isotonic with human oral mucosa.A herbal guava mouthwash has been prepared using guava leaf extract, sodium lauryl sulphate, peppermint emulsion and chloroform water. Formulations with highest quantity of guava leaf extract have highest antimicrobial activity due to the presence of bioactive substances. It is more potent against Streptococcus mutans and Escherichia coli.

1.1 Benefits of Mouthwash

- Get A Fresh Breath. This one is the most common.
- Say Goodbye to Particles. It is very common nowadays that most of the people use mouthwash only after brushing their teeth.
- Avoids Plaque.
- Fights Cavities From Growing. .
- Cures Canker Sores.

1.2 7 Daily Oral Care Solutions for Bad breath and Healthy mouth

A. Use Non-Toxic Toothpaste

Opt for a toothpaste that uses natural antibacterial agents and breath fresheners like neem, liquorice, eucalyptus, clove and peppermint. Eliminate products that use sodium lauryl/laurethsulfate, triclosan, sodium hydroxide, and other nasty chemicals, as these can damage your body and reduce healthy bacteria (probiotics) in the mouth.

B. Keep your tongue Clean with Tongue Scraping

A traditional ayurvedic technique, tongue scraping cleans bacterial build-up, food debris, fungi, and dead cells from the surface of the tongue. This also freshens the breath and stimulates the metabolism.

C. Try Ionic Toothbrushes

Studies have revealed the benefits of ionic toothbrushes, which reduce hypersensitivity, plaque and bleeding. Ionic toothbrushes temporarily reverse the polarity of the tooth surface from negative (-) to positive (+), drawing plaque

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towards the toothbrush head. As a result, you are able to clear more plaque. In addition, because the teeth's polarity is temporarily reversed, your teeth reject plaque even in areas that haven't been touched by bristles.

D. Intake Oral Probiotics for Oral Health

It may come as a surprise, but the mouth needs good bacteria too. This is where oral probiotics can be extremely beneficial, especially if cavities are a frequent occurrence. The more good bacteria you have, the stronger of a defence you have against the bad bacteria, reducing the incidence of inflammation and infection.

E. Drinking Green Tea

Another benefit of green tea is healthier teeth and gums, and reducing the chances of periodontal diseases. The high levels of antioxidant catechin have a proven ability to reduce inflammation in the body, as well as the indicators of periodontal disease, thereby reducing bad bacteria in the mouth.

F. Vitamin C

A healthy dose of Vitamin C not only boosts our immune system, it keeps our gums happy too. Vitamin C is needed for healthy gums, reducing the incidence of bleeding gums, gingivitis, and even periodontitis.

G. Tea Tree Oil Floss

There is just no way around it – flossing daily is an integral part of keeping our mouths fresh and clean. Adding tea tree oil is a little bonus, as tea tree oil is a natural disinfectant that reduces bad oral bacteria. Research indicates that tea tree oil significantly reduces gingivitis and bleeding of the gums, even in those with gingivitis.
Keep these essentials in mind, and in your daily routine, for a healthier mouth that leads to a healthy body.

1.3 Need of Mouthwash

1. From gingivitis Mouthwash act on oral pathogen and also producing less stable effects as compared to synthetic herbal products.
2. Herbal mouthwash are demanded because they instantly relives the pain.
3. Herbal mouthwash can help to prevent and various infectious disease.

II. OBJECTIVES

1. To determine the antimicrobial activity.
2. To evaluate mouthwash for its consistency.
3. To develop formulation of herbal mouthwash,
4. It can reduce the plaque growth in your mouth, decrease your chances of developing gum disease, and prevent tooth decay.
5. To determine if commercially available mouthwashes are capable of performing the advertised elimination of common oral bacteria.
6. Role of alcohol in the mouthwash after the advent of more effective agents.
7. Determine whether there has been an increased risk observed with alcohol based mouthwash.
8. Check the ratio of mouthwash usage between dental and non dental community.

III. MATERIALS and METHODS

3.1 Drug Profile

1. Clove oil
2. Peppermint oil
3. Sodium lauryl sulfate
4. Patent v
5. Water

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A. Clove oil

Cloves are the aromatic flower buds of a tree in the family Myrtaceae, Syzygiumaromaticum. They are native to the Maluku Islands in Indonesia, and are commonly used as a spice, flavoring or fragrance in consumer products, such as toothpaste, soaps, or cosmetics. spice and are also used in Chinese and Ayurvedic medicine. Clove oils, dried Clove (Syzygiumaromaticum) is **a tree native to Indonesia**.

Its dried flower buds are a popular flower buds, leaves, and stems are used to make medicine. Cloves are full of antioxidants. These compounds help your body to fight free radicals, which damage your cells and can lead to disease. By removing free radicals from your system, the antioxidants found in cloves can help **reduce your risk of developing heart disease, diabetes, and certain cancers**.

- **Scientific name:** Syzygiumaromaticum
- **Family:**Myrtaceae
- **Order:**Myrtales
- **Kingdom:** Plantae

Benefits of Clove

cloves can reduce gum swelling and irritation, stimulate circulation, enhancing gum tissue health, help soothe toothache pain, fight bad breath and kill bacteria in the mouth.

Collection and Extraction of Clove Oil

The plant (100 g of dried and ground clove buds) in 500 ml flask was submitted to hydrodistillation for 4 to 6 hours and steam distillation for 8–10 h. The volatile distillate was then collected until no oil drops out. The volatile distillate was saturated with sodium chloride and added with some ether.

To extract clove oil from cloves by steam distillation

Steam distillation is used because if the cloves were heated directly, the oil and cloves might be damaged, instead it is heated by the steam which is gentler. The safety tube must be below the surface of the water in the boiling flask.

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B. Peppermint Oil

Peppermint is a hybrid mint, a cross between watermint and spearmint. Indigenous to Europe and the Middle East, the plant is now widely spread and cultivated in many regions of the world. It is occasionally found in the wild with its parent species.

Peppermint (*Mentha* × *piperita*, also known as *Menthabalsamea* Wild is ahybridmint, a cross betweenwatermint and spear mint. Indigenous toEuropeand theMiddle East, the plant is now widely spread and cultivated in many regions of the world. It is occasionally found in the wild with its parent species.

Although the genus *Mentha* comprises more than 25 species, the one in most common use is peppermint. While Western peppermint is derived from *Mentha* × *piperita*, Chinese peppermint, or *bohe*, is derived from the fresh leaves of *M. haplocalyx*. *M.* × *piperita* and *M. haplocalyx* are both recognized as plant sources ofmentholandmenthone, and are among the oldest herbs used for both culinary and medicinal products.

- **Kingdom:** Plantae
- **Order:**Lamiales
- **Family:**Lamiaceae
- **Genus:**Mentha
- **Species:**M.xpiprerita

Benefits of Peppermint Oil

Peppermint oil is promoted for topical use (applied to the skin) for problems like headache, muscle aches, joint pain, and itching. In aromatherapy, peppermint oil is promoted for treating coughs and colds, reducing pain, improving mental function, and reducing stress.

Collection and Extraction of peppermint oil

The invention discloses a peppermint oil simple extraction method. The peppermint oil simple extraction method comprises following steps: mint stem and leaf are crushed into powder; obtained mint powder is added into hydrochloric acid, pH value of an obtained solution is adjusted to 1 to 3, and immersion is carried out for 4 to 6h; the solution is delivered into a distillation tower made of stainless steel or glass fiber reinforced plastic for steam distillation; an effluent is collected, and is subjected to extraction with benzene for 2 times so that peppermint oil enters into an organic phase; the organic phase is collected, and is subjected to dewatering and pressure reduction separation so as to obtain peppermint oil; and the extraction agent is recycled. The peppermint oil simple extraction method is capable of increasing extraction yield and product purity of peppermint oil greatly, is simple, and is easy for operation; and less environmental pollution is caused.

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C. Sodium Lauryl Sulfate

Mouthwashes containing 0.3% or 0.15% triclosan in combination with 1.5% sodium lauryl sulfate (SLS) produced a significant reduction in plaque formation in a test panel of 11 students who refrained from oral hygiene during the test periods, during which they rinsed twice daily with different mouthwashes.

D. Patent V

It is used in colouring agent and formed the blue colour to the formulation.

E. Water

It is used as the solvent to make up the volume of formulation.

3.2 Methods

Formulation containing ingredients such as clove oil, peppermint oil, sodium lauryl sulfate, patent v.
Method of preparation

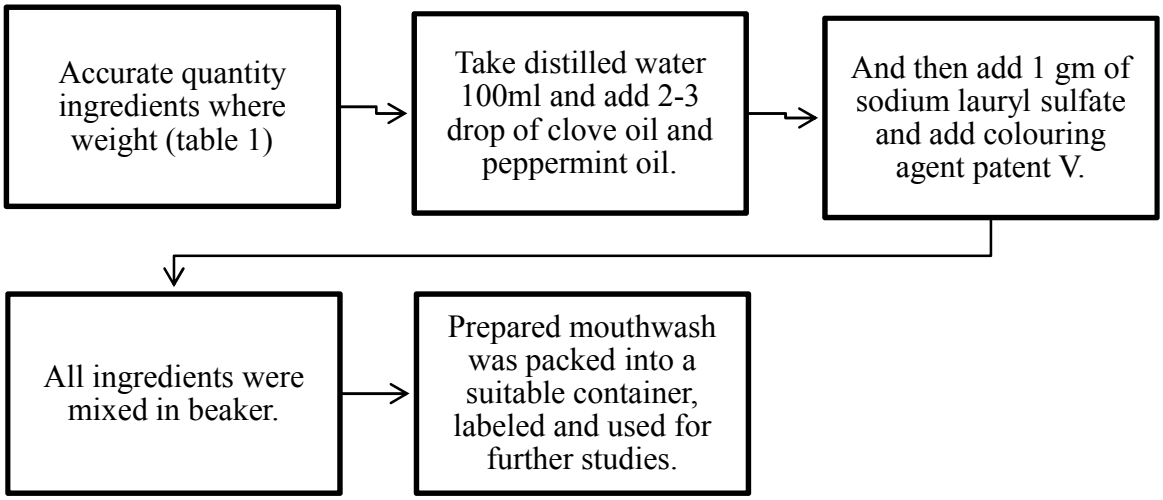

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Fig .1 Prepared Mouthwash

Table 1: Formula for Mouthwash

Sr.No	Name of ingredients	Scientific name	Qantity	Uses
1	Clove Oil	Syzygiumaromaticum	2-3 drops	Analgesics,anti-inflammentry
2	Peppermint Oil	Memtha x piperita	2-3 drops	Freshner,antibacterial,antifungal
3	Sodium lauryl sulfate	Sodium lauryl sulfate	1 gm	Buffering agent
4	Patent V	-	1 drop	Coloring agent
5	Water	-	100 ml	Quantity sufficient

Procedure of mouthwash

Take prepared mouthwash as per the requirement take distilled water 100 ml and add 2-3 drops of clove oil and peppermint oil and then add sodium lauryl sulfate and add coloring agent patent v. All ingredients were mixed in beaker.

Evaluation of mouthwash

1. **Physical evaluation** -Physical parameter such as color, odour taste and consistency was examined by visual examination.
2. **pH** -The pH of prepared herbal mouthwash was measured by using digital pH meter.
3. **Viscosity**- Viscosity is measured with the help of digital viscometer.
4. **Microbial Assay** – The antibacterial activities were evaluated by measuring the zones of inhibition (in mm).
5. **Stability studies** – Physical parameters likecolor, odor , consistency and PH was determined at room temperature and 40^0c.
6. **Taste** – The taste is strong and remain almost same over the week except for the ambient temperature sample.
7. **Flavor** – The flavor is almost unchanged and has an excellent fragrance of clove and peppermint. Only a week after, the fragrance is somewhat lost when kept at ambient temperature.

Following evaluation parameters were performed to ensure superiority of prepared mouthwash.

1) Physical Evolution

Mouthwash was evaluated for Morphological parameters shown in the table. The color of Formulation is blue. The older is sweet spicy clove phenolic woody nutmeg powder. The texture is very hard wood texture that may pose a physical hazard if biting it to it unnoticed.

2) pH

The pH meter was calibrated with the help of standard buffer solutions weight 1 ml of mouthwash and 50 ml of distilled water and its pH was measured with the help of digital pH meter.

3)Viscosity

Viscosity of the mouthwash was determined with the help of digital viscometer at 100 rpm with the spindle 6.

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4) Microbial evalution

Agar media was prepared then the formulated mouthwash was inoculated on the plates agar media by steak plate method and controlled is prepared by mouthwash. The plates were placed in the incubator and are incubated 37^0c for 24 hours. After the incubation period the plates were taken out and the Microbial growth were checked and compared with the control.

5) Stability studies

The result of stability were shown in table no change in color, order, texture was observed. The Stability studies showed a slight change in PH formulation at 40^0c.

6) Taste

Clove oil contains a chemical called eugenol, which acts as an anesthetic and antibacterial agent. Clove oil is anti-inflammatory and antifungal. It is available from many supermarkets, drug stores, and health food shops, or can be bought online. It has a strong, warm, and spicy taste.

7) Flavor

It has a tingly, spicy flavor similar to cinnamon.

Excipients Profile

Sodium laurilsulfate(SLS) is an alkaline , anionic surfactant. In medicinal products, SLS has a number of functional uses an emulsifying agent, penetration enhancer , solubilising agent , tablet and capsule lubricant. SLS is not use in parenteral products.

IV. RESULT AND DISCUSSION

Following evaluation parameters were performed to ensure superiority of prepared mouthwash.

4.1 Morphological Evolution

Mouthwash was evaluated for Morphological parameters shown in the table.

The color of Formulation is blue. The older is sweet spicy clove phenolic woody nutmeg powder. The texture is very hard wood texture that may pose a physical hazard if biting it to it unnoticed.

Table 2: Morphological Evolution

Sr.No	Parameters	Observation
1.	Colour	Bluewish
2.	Odour	Deep spicy wood clove
3.	Appearance	Visual Appearance
4.	Texture	Liquid

4.2 pH

The pH meter was calibrated with the help of standard buffer solutions weight 1 ml of mouthwash and 50 ml of distilled water and its pH was measured with the help of digital pH meter.

Table 3: pH of Sample

Day of Measurement	pH of the sample
0th day	5.5 and 5.3

4.3 Viscosity

Viscosity of the mouthwash was determined with the help of digital viscometer at 100 rpm with the spindle 6.

4.4 Microbial Evalution

Agar media was prepared then the formulated mouthwash was inoculated on the plates agar media by steak plate method and controlled is prepared by mouthwash. The plates were placed in the incubator and are incubated 37^0c for 24

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hours. After the incubation period the plates were taken out and the Microbial growth were checked and compared with the control.

Table 4: Microbial evolution

Storage of temperature sample	Storage life (log cfu/ml) – 0 th day
Ambient	No growth
Refrigerated	No growth

a) b)

Fig. 3 : a) Before keeping in incubator

b) After incubator

Stability studies –

The result of stability were shown in table no change in color, order, texture was observed. The Stability studies showed a slight change in PH formulation at 40^0c.

Table 5: Stability test

Sr.No	Parameter	At Room Temp	At 40^0c
1.	Color	No Change	No Change
2.	Odour	No Change	No Change
3.	Texture	Liquid	Liquid
4.	PH	5.57	5.34

V. CONCLUSION

The present liquid herbal mouthwash can work in long way to help people to get rid of bad breath and many oral disorders. Besides we can be rest assured and take comfort in the fact that there aren't any unhealthy ingredients present in this preparation. The physicochemical evaluation results confirm that the colour and odour of present herbal formulation is acceptable with a pleasant odour and a better after effect.

The results of zone of inhibition also confirmed that this herbal mouth rinses was found to be a potent plaque inhibitor, and were preferred by the patients for its taste, convenience of use and test duration in their mouth after rinsing. Thus, these can be used as an adjunct to mechanical therapy for treating plaque induced gingivitis. Present study has an important. impact in order to create an effective and inexpensive herbal oral health intervention for low social economic communities However this study was short-term study so long term studies are required with larger. The natural herbs used in present formulation have been medicinally proven to prevent the problem of oral hygiene and bad breath. Since years and decades, these herbs have been known for working wonders as reflected in many research findings. Person can easily rinse his mouth using this herbal mouthwash and stay clear of wide variety of oral health issues.

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