

Formulation of Herbal Mouth Wash using Psidium Guajava, Ocimum sanctum and Cinnamomum Verum Extract



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ABSTRACT: Medicinal plant or herbs are considered to have rich source of ingredients which can be used in drug development. The formulation of herbal mouthwash is a natural approach to oral hygiene that utilizes plant-based ingredients to create a safe and effective mouthwash. Herbal mouthwash is intended to provide a range of benefits, including anti-bacterial, anti-inflammatory, and anti-plaque effects, as well as freshening breath and promoting healthy gums and teeth. The formulation of herbal mouthwash offers an alternative to chemical-based oral hygiene products that can sometimes cause irritation and sensitivity. With the growing interest in natural remedies and alternative health practices, the formulation of herbal mouthwash offers a promising solution for those seeking a more natural approach to oral hygiene. The main objective of this literature work is to prepare and evaluate a herbal mouthwash and check its effectiveness against microorganisms of oral cavity. The prepared mouthwash was evaluated against pathogens and was found effective for controlling and demolishing microbial growth in mouth. Further physiochemical properties were tested for mouthwash and it possesses a good antibacterial activity. Next, studies on physical evaluation, pH measurement, stability, viscosity and antibacterial activity were conducted.

KEYWORDS: Herbal Mouthwash, Tulsi extract, Guava extract, Cinnamon Extract, Oral hygiene, Antibacterial property

INTRODUCTION

The mouth washes are concentrated aqueous anti-bacterial solution that are used against oral microbes to counter oral infection, cleansing to get rid of bad breath refreshing, anti-septic [1].

Mouthwashes may serve as a measure in controlling dental plaque and periodontal disease for mentally or physically handicapped patients who are incapable of brushing their teeth themselves or other individuals who are lacking dexterity, skill, or motivation for mechanical plaque removal

Several antimicrobial chemical agents such as chlorhexidine metronidazole etc. have been used. However, these artificial drugs have unpleasant side effects, so researchers are trying to pay more attention to herbal drugs. Plants and plant's isolates demonstrates effects that are immune enhancing, anti-inflammatory, anticancer etc. [2-3].

The use of "herbal" medicine has sparked interest and resulted in the emergence of complementary and alternative therapies in healthcare promotion in many regions of the world due to the increased awareness of indigenous medical traditions. Herbal compounds have been used in oral care products for some time, most commonly in South Asian nations,

to help individuals with gingivitis improve their oral hygiene [4-5].

Herbal mouthwash is a natural alternative to commercial mouthwashes. It can help maintain oral hygiene, freshen breath, and may have other benefits depending on the ingredients used [6].

Herbal mouthwash carries a natural ingredients called phytochemical that consists of desired anti-microbial impact. Natural mouthwash will become greater famous they paintings without alcohol, artificial preservatives, taste or colors [7].

Mouthwash is necessary for treating a variety of oral health issues, nose fresheners to the administration of potentially deadly subsequent infections in individuals, such as oral mucositis receiving transplantation of bone marrow therapy [8].

Dental plaque is a bio film of microorganisms that present naturally on the exposed tooth surface. It causes many periodontal conditions and other oral health issues and its regular removal from the oral cavity can prevent many periodontal problems. Plaque control normally involves preventive measures aimed at removing dental plaque and preventing it from recurring [9].

The dental plaque is produced by initial colonizing bacteria in the salivary film of enamel, followed by

secondary colonization through antibacterial adhesion [10].

Nowadays, the majority of people are choosing natural herbal products for the prevention or treatment of diseases. Plants being an abundant source should be considered in various pharmacological formulations. Ayurvedic medicinal plants are used in various treatments, as there are no or minimal side effects. For long-term use of mouthwashes, numerous mouthwashes have been tested *in vitro* and *in vivo*. Ayurvedic medicines give a holistic approach toward entire human beings. It can maintain the balance between general and oral health as well as an environment which is in this era necessary for the well-being of humans [11].

Goal of herbal mouthwash

1) To enhance dental hygiene. 2) It aids in the management of dental plaque. 3) It is applicable to gum diseases. 4) Used to eradicate bacteria in the mouth. 5) It masks bad breath and freshens the breath. 6) It's crucial to use mouthwash to avoid gum disease. 7) It is utilized for cleaning septic tanks. 8) It reduces inflammation and pain. 9) Managing halitosis and mucositis [12].

The purpose of herbal mouthwash tousing Psidium Guajava, Ocimum sanctum and Cinnamomum Verum Extract improve oral health. It facilitates the control of dental plaque. It can be used for gum disease. It used to get rid of oral bacteria. It freshens and covers up foul breath. Using mouthwash is essential to preventing gum disease [12-13].

MATERIALS AND METHODS

Natural polymers including Psidium Guajava, Ocimum sanctum and Cinnamomum were employed as anti-bacterial, anti-inflammatory, and anti-plaque effects, as well as freshening breath and promoting healthy gums and teeth. Peppermint oil was as Flavoring agent. Propylene glycol was used as Thickener and Tween -80 as Surfactant.

Methods

Extraction of Psidium Guajava Leaves

We collected guava leaves from Botanical Garden and kept for sundry for 3 days. After sun drying grind it to coarse powder for further extraction process [12]. Extraction process of guava leaves Preparation of hot water extract Hot water extract was prepared by plain decoction method. For this 25 gm of leaf powder was taken into a beaker containing 200 ml of sterile double distilled water. This was heated in water bath till the volume of the extract reduced to less than 50 ml. The liquid was filtered using Whatman's filter paper no.1[14].

Extraction of Ocimum sanctum (leaves)

Tulsi leaves were obtained from local market. Leaves were separated from the stem, washed in

clear water and dried until they were adequately dry to be ground (dried for 7 days). Dried leaves were powdered separately in an electric grinder until a homogenous powder was obtained. Ethanolic extract was prepared from the powder obtained using "cold extraction method. A total of 250 g of finely powdered Tulsi was macerated with 100% ethanol for 3 days. The alcoholic decoction was subjected to filtration with Whatman #1 filter paper to obtain a clear filtrate. The filtrate thus obtained was reduced at a low temperature of <60°C to obtain a solid residue of Tulsi extract. From the 250 g of Tulsi powder dissolved in 1 L of ethanol, approximately 18 g of solid residue (extract) was obtained [15-22].

Extraction of Cinnamon: The literature search revealed that even seemingly simple extraction methods involve several steps, including extracting at 40°C, stirring rapidly for 10 min, centrifugation, chilling the beaker with the extract in an ice bath, and stirring, followed by filtration and lyophilization, to a simple one-step extraction process, where the ground cinnamon powder was re-suspended in sterile water (70°C for 1 h), centrifuged, and used after filtration [23-25].

Method of preparation

STEP 1: Wash all the apparatus and weigh all the ingredients properly.

STEP 2: -In one beaker add ethanol and peppermint oil. Take another beaker and add glycerol, propylene glycol, Tulsi extract with warm water and guava extract, cinnamon extract and dilute the solution.

STEP 3: Add Beaker -1 into Beaker-2. Then add sodium benzoate.

STEP 4: The Prepare mouthwash store and kept in tight and close container.

The Formulation of herbal Mouthwash The herbal Mouthwash was prepared by the formula given in Table 1.

S.No	Ingredients	M1
1.	Guavaleaves extract	25 ml
2.	Tulsi leaves extract	5 ml
3	Cinnamon Extract	2ml
4.	Peppermint oil	1 ml
5.	Propylene glycol	7.5 ml
6.	Sodium benzoate	0.1 gm
7	Glycerol	5.96 ml
8.	Ethanol	1 ml
9.	Water	q.s

Evaluation of mouthwash

1. **Physical parameters:** like odour and color were examined by visual examinations.

2. **pH:** pH of prepared herbal mouthwash was measured by using digital pH meter. The pH meter

was calibrated using standard buffer solution about 1 ml of mouthwash was weighed and dissolved in 50ml of distilled water and its pH was measured [26].

3. Determination of Antibacterial Property of Mouthwash: Twenty-four hour freshly prepared cultures of Streptococcus mutans and E. coli are used that are prepared from slant cultures of Streptococcus mutans and E. coli. This is done by: nutrient broth is prepared; pH is tested and sterilized. Using a sterilized loop, some inoculum is transferred from old culture to the newly prepared nutrient broth in the laminar. These subcultures are now placed in incubators at 37 °C for 48 h. Petri dishes are filled with 15 mL agar media as above and allowed to get cooled. Using a marker, each Petri dish is divided into two halves. 0.05 mL of Streptococcus mutans is added to one Petri dish and 0.05 mL of E. coli is added to the other. After adding the inoculum, the inoculum is spread by the spreader. The Petri dishes are kept in the incubator at 37 °C for 5 min. The Petri dishes are taken out and placed in the laminar. Using the borer, wells are created in the inoculum-applied agar media on each of the halves of the Petri dishes. This method is

known as the bore well method. 0.05 mL of the refrigerated mouthwash sample is applied in one half and 0.05 mL of ambient temperature mouthwash is placed in the other half. This process is repeated respectively for the Streptococcus mutans and E. coli Petri dishes. The Petri dishes are now kept in the incubator at 37 °C for 24 h. After 24 h, Petri dishes are looked for inhibition zones around the wells [26].

4. Test for stability: The purpose of the stability test is to make sure that the mouthwash formulations can keep the same properties throughout the long term before conducting an antimicrobial test. Prior to antimicrobial testing, many mouthwash formulations undergo stability testing. This test evaluated the mouthwash formulation's visual appearance, physical separation, and homogeneity. The mouthwash was then stored at temperature at 30°C while the appearance was assessed on each 10 days up to 1 month and the results were recorded [27].

5. Viscosity: Viscosity of the mouthwash was determined with the help of digital viscometer at 100 rpm with the spindle 6 [28].

RESULT AND DISCUSSION

1. Physical parameter:

Table 2: Physical parameter of Herbal Mouthwash

Parameters	Formulation
Colour	Dark brown
Taste	Slightly bitter
Odour	Minty

2. pH Stability analysis: It showed a colour which detected the pH range between 5-6 by comparing, it with standard pH colour range

Table 3: pH analysis of Herbal Mouthwash

Day of measurements	pH of sample	pH of standard
0 th day	5-6	5-6
15 th day	5-6	5-6

3. Antibacterial Activity:

Table 4: Antibacterial Activity of Mouthwash

Organism	Zone of inhibition
Streptococcus mutans	8 mm
E. coli	6 mm

4. Stability analysis:

Table 5: Antibacterial Activity of Mouthwash

Temperature and humidity	Evaluation parameter	Observation (in DAYS)			
		Initial	10	20	30
30°C±2°C/ 60% ± 5% RH	Visual appearance	Dark brown	Dark brown	Dark brown	Dark brown
	Phase separation	Nil	Nil	Nil	Nil
	Homogeneity	Good	Good	Good	Good

	pH	5	5	5	5
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7 Viscosity:

Table 6: Viscosity of Herbal Mouthwash

Formulations	Viscosity (in Centipoise)
Herbal mouthwash	1.690
Standard	2.352

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 effects. The results of zone of inhibition also confirmed that this herbal mouth rinses were 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.

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