INTERNATIONAL JOURNAL OF PHARMACEUTICAL SCIENCES
[ISSN: 0975-4725; CODEN(USA): IJPS00]
Journal Homepage: https://www.ijpsjournal.com

OPEN ACCESS

Research Article

Formulation and Evaluation of Herbal Mouthwash of Rumex Vesicarius leaves extract

Divya Golait*, Prajakta Nikam, Ashwini Dongare, Shital Bhosle, Milind Suryawanshi, Dr. Ramesh Ingole

Djps college of pharmacy, pohetakali dist parbhani

ARTICLE INFO

Published: 14 Jun. 2026
Keywords:
herbal Mouthwash, RumexVesicariu, mouth problems ,bad breath
DOI:
10.5281/zenodo.20692113

ABSTRACT

The formulated herbal mouthwash showed promising results in terms of safety, stability, and antimicrobial effectiveness. It gives antimicrobial and anti- inflammatory action, making the formulation suitable for maintaining oral hygiene and preventing dental issues such as gingivitis, plaque, and bad breath. The evaluation results confirmed that the mouthwash remained physically stable, The physicochemical evaluation results confirm that the colour and odour of present herbal formulation is acceptable with a pleasant odour and better after effects, acceptable pH, good viscosity & foamability ,less turbidity and showed no microbial contamination. The result of zone of inhibition also confirmed that this herbal mouth rinses was found to be potent plaque inhibitor, and were preferred by the patient for its taste. The findings support the use of herbal mouthwash as a cost effective, natural, and safer alternative to chemically formulated commercial mouthwashes that may cause side effects such as staining, irritation, or taste alteration. Person can easily rinses his mouth using this herbal mouthwash and stay clear of wide variety of oral health issues. Thus, the study concludes that herbal mouthwash can be an effective natural oral care product, especially for individuals seeking chemical -free options.

INTRODUCTION

Mouthwash is a simple, flavored, coloredsolution that is aimed to refresh the breath by swishing the product around the mouth, followed by spitting it out. Similar to Mouthwash it may also have additional benefits such as prevention against tooth decay, gingivitis, plaque formation or tartar formation. Mouthwashes, exclusively for bad breathe and refresh the mouth. Herbal mouthwashes have hydrogen peroxide and chlorhexidine which produce discoloration of

***Corresponding Author:** Divya Golait
Address: *Djps college of pharmacy, pohetakali dist parbhani*
Email : rambhaugolait265@gmail.com

Relevant conflicts of interest/financial disclosures: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

teeth and side effects and also they are effective. Good oral hygiene is a vital for overall well-being, and mouthwash is an important component of this practice. While many conventional mouthwashes utilize antiseptic to manage plaque buildup,they frequently include artificial preservative, alcohol and synthetic flavors. In contrast herbal mouthwashes provide a natural and effective means of combating oral bacteria without adverse side effect. Herbal mouthwash is formulated with powerful plant derived ingredients recognized for their antimicrobial, anti-inflammatory, and analgesic effect. Unlike their chemical counter parts, herbal formulation operate, gently and effectively, diminishing plaque, gingivitis, and unpleasant breath while enhancing gum health. A significant benefit of herbal mouthwash is its alcohol-free formulation, rendering it a safer and gentler choice for everyday use. Mouthwash, mouth rinse , or mouth bath passively or skilled around the mouth by contraction of the personal muscles and / or movement of the head , and may be gargled where the head is tilted back and the liquid bubbled at the back of the mouth .usually mouthwashes are antiseptic solution intended to reduce the microbial load in the mouth, although other mouthwashes might be given for other reasons such as for their analgesic , anti-inflammatory or antifungal action.additionaly some rinses act as saliva substitutes to neutralize acid and keep the mouth moist in xerostomia (dry mouth) .cosmetic mouth rinses temporarily control or reduce bad breath and leave the mouth with a pleasant taste. Herbal mouth washes are in high demand , because they act on oral pathogens and relieve the pain instantly and are also less side-effective. Chemical mouthwashes have hydrogen peroxide and chlorhexidine as an immediate whitener, sterilizer and pain reliever of teeth, buy they tend to produce decoration of teeth and may produce side effect, meanwhile they are cost effective. One of the most common infectious diseasencountered by many individual is dental carries and periodontal diseases at different stages of their life time. 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 . The mouthwash plants an prominent role in the oral hygiene of an individual, it help to relieve symptoms of inflamed gums gingivitis and also it reliable used to destruct the pathogenic germs. The mouth washes are used by most of the dental patient to overcome sour mouth (xerostomia) , underrated throat and sensitive teeth .Dentists always use mouthwash as an antimicrobial agent before oral surgery of the patient, because they help to sterile the surface of the inflamed gums and teeth, thereby the contamination of any other microorganisms can be avoided.

Herbal mouthwash

Herbal mouth washes are mouthwashes which are prepared from natural plant extract. The natural extract present in herbal mouth washes are obtained from various plant leaves, fruits, seeds and various tree oils why should we prefer herbal mouthwash? Herbal mouthwashes are high in demand, because they act on oral pathogens and relive the pain instantly and are also fewer side effects. Chemical mouthwashes have hydrogen peroxide and chlorhexidine as animmidiate whitener, sterilizer and pain reliever of teeth, but they tend to produce discoloration of teeth and may produce side effect, meanwhile they are cost effective

Benefits of herbal mouthwash

- For the following reasons, Herbal Mouthwash has become more advantageous then chemical mouthwash:

- Herbal mouthwashes are non-irritant and they have non-staining properties.
- They are less harmful and have very few or no side effects.
- Herbal mouthwashes are better option for even the most sensitive mouth.
- Herbal mouthwashes have naturally antimicrobial property as they have polyphones.
- It doesn't contain any abrasive additives.

Unlike chemical mouthwash, herbal mouthwash does not cause dry mouth

Goal of herbal mouthwash

- To enhance dental hygiene.
- It aids in the management of dental plaque.
- It is applicable to gum disease.
- Used to eradicate bacteria in mouth.
- It masks bad breath and freshens the breath.
- It's crucial to use mouthwash to avoid gum disease.
- It is utilized for cleaning septic tanks.
- It reduces inflammation and pain.
- Managing halitosis and mucositis

Fig .no1. *RumexVesicarius*

Material and method

List of Instruments& glassware used

Sr. No	Name
1	Digital pH-Meter
2	Digital Balance
3	Stability Chamber
5	Autoclave
6	Incubator
7	Hot air oven
8	Soxhlet apparatus
9	Mortor and pestle
10	Petri dish
11	Measuring cylinder

Extraction Process

1. Selection of Plant Material:

Use young to medium-mature leaves (4-6 inches long, vibrant green)
Avoid very old or yellow leaves.
Wash thoroughly to remove dirt and surface microbes.

2. Drying:

Shade dry at room temperature for 5-7 days.
Do not sun dry or oven dry at high temperature as it degrades sensitive compounds.
Turn leaves occasionally to ensure uniform drying.

3. Powdering:

Grind dried leaves into coarse or fine powder using grinder or mortar -pestle.
Sieve through mesh (e.g. #40) to ensure uniform size.

4. Extraction Method:

Use Soxhet extraction & ethanol was used as solvent for 24 hours

5. Storage of Extract

Store in amber glass bottles to protect from light.
Keep refrigerated at 2-8°C.
Add natural preservatives if long-term storage is needed (e.g., sodium benzoate 0.1%, citric acid 0.05%).

6. Extract Amount:

You need 5 ml of guava leaf extract for one formulation extraction Yield Assumption:
On average, 10 grams of dried guava leaves yield about 5 ml of extract using ethanol/water maceration (a 50% w/v extract yield).
This assumes moderately young, shade-dried leaves and efficient maceration or decoction.

Collection of fresh Leaves of *rumex vescicarius*
⇩
Washing & shade drying
⇩
Powdering
⇩
Weighing of powder
⇩
Loading in to soxhlet thimble
⇩
Addition of solvent ethanol
⇩
Soxhlet extraction(24 hours)
⇩
Collection of extract and solvent evaporation
⇩
Concentrate leaf extract
⇩
Drying of extract

Percentage yield of latex: Percentage yield of extract was calculated by dividing the Weight of extract by the Weight of the leaf powder taken for extraction.

$$\text{Percentage yield} = \frac{Weight\ of\ extract\ (g)}{Weight\ of\ powder\ (g)} \times 100$$

Figure .2: Extraction *Rumex Vescicarius* leaves

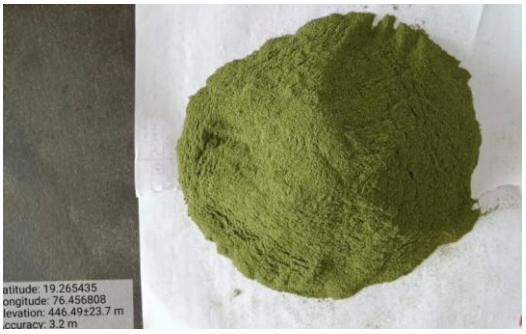

Figure 3.powder Rumex *Vescicarius* leaves

Preparation of Herbal Mouthwash

Collection of ingredient

⇩

Addition of extract

⇩

Addition of other excipients

⇩

Proper mixing by continuous stirring

⇩

Evaluation of prepared mouth wash

⇩

Physiochemical & antimicrobial test

⇩

Packing and labeling

Table No.1: Five batches i.e. F1, F2, F3, F4, F5, of Herbal Mouthwash were formulated by varying quantity of *Rumex Vescicarius*extract

Sr. No	Ingredients % w/v	Category	Batches				
			F1	F2	F3	F4	F5
1	RumexVescicariusExtract (g)	Active ingredient	4	3	6	5	4
2	Papermint oil	Flavouring agent	1.5	1	1.5	1.2	1.4
3	Sodium lauryl sulphate (g)	Surfactant	0.3	0.4	0.3	0.3	0.3
4	Glycerine (ml)	Humectants	4	5	3	3	4
5	Sodium Saccharin (g)	Sweetener	0.06	0.06	0.06	0.06	0.06
6	Distilled Water (ml)	Vehicle	Qs	Qs	Qs	Qs	Qs

Optimized formulation

Figure 4.: optimized formulation

Evaluation of Formulated Herbal Mouth Wash

Evolution of herbal Mouth Wash was done according to "Bureau of Indian standards" and these tests were performed for all herbal Mouth Wash formulation. This test includes.

1. Physical Examination[22]

All these physical parameters of the formulation were checked visually-

A. **Colour**: The colour of the formulations was checked out against white & black backgrounds.

B. **Odour**: The odour of the formulation was checked by taking smell.

C. **Taste:** Taste was checked manually by tasting the formulation.

D. **Smoothness:** smoothness was tested by rubbing the paste formulation between the fingers.

2.PH: pH of prepared herbal mouthwash was measured by digital pH meter. The pH meter was calibrated using standard buffer solution about 1 ml of mouthwash was weighed and dissolved in 50 ml distilled water and its pH was measured.

Figure 5. : Digital ph meter

3.Foam Height:

1 ml of mouthwash was mixed in 50 ml distilled water. The mixture was poured into a 500 ml measuring cylinder. Water was added to the volume to make it 100 ml. The mixture received 25 strokes, after which it was kept aside . The height of the foam above the aqueous volume was observed.

Fig .6.Determination of Foamiabiliy

4.Turbidity:

Turbidity is the term used to describe a fluids cloudiness or haziness as a result of individual particle (supended solid or liquid) that are typically invisible to the unaided eye. The unit of turbidity from a calibrated turbidimeter are called Nephalometric Turbidity Units (NTU's). A formulation with an NTU of less than 12 (or about 12) is referred to as a clear formulation. Turbidity of all three formulation of mouthwash was measured by using Nephelometry (Turbidity Meter).

Fig. 7. Nephelometer

5. Viscosity:

Using an Ostwald Viscometer, the viscosity of mouthwash formulation was measured. The viscometer was mounted vertical position on a suitable stand. Mouthwash was filled in to the viscometer up to mark A. The time was counted for mouthwash to flow from A to mark B. Viscosity was measured in triplicate.

Fig.8.ostwald viscometer (viscosity determination)

5. Stability study [18, 19]:The purpose of Stability study of herbal mouth wash formulation was to provide the evidence of quality of product varies with time under the influence of temperature factors such as temperature, humidity, light. The prepared herbal Mouthwash formulation were packed in air tight container at three different temperature ,humidity conditions i.e. Refrigerator condition $4^0 \pm 2^0$C Room temperature 25 $\pm$ 2^0C/ 60% $\pm$ 5%RH, and oven 40 $\pm$ 2^0C/ 75% $\pm$ 5%RH. The sample were withdrawn at different time interval over a period of one month & evaluate the test of Physical appearance i. e colour, odour, appearance, other was pH, Homogeneity, Spread ability, extrudability.

RESULT

Table no .2 Pharmacognostic characterization of plant

Sr.No.	Part of plant	Description
1	Leaves	Dark greenish – green
2	Flower	pink
4	Stem & Bark	Green

Table no .3.Percentage yield of extract

Sr. No	Raw powder	Solvent	Extract quantity	% Yield
1	100 gm	Petroleum ether	24 g	24%
2		Ethanol	20 g	20%
3		Methanol	25 g	25%

Table no .4.Organoleptic Characteristic of extract

Sr. No	Parameter	Observation of Extract		
		PE	ET	ME
1	Physical Appearance	Sticky paste	Sticky mass	Sticky paste
2	Colour	Dark Green	Greenish black	Greenish
3	Odour	Characteristic	Characteristic	Characteristic
4	Taste	Bitter	Slightly bitter	Slightly bitter

Table Table no .5.Antibacterial Activity of Extract

Sample	Zone of Inhibition(mm)
	E.coli
Methanolic Extract	18
Ethanolic Extract	15

Table no .6.Antibacterial activity of Herbal mouthwash

Sr no	Microorganism	Concentration(mg/ml)	Zone of Inhibition(mm)	
			Formulation	Standard
1	E.coli	100	15±0.2	24±0.2
2		250	18±0.2	30±0.2

Figure 8.3 A) Zone of Inhibition of E .Coli

Figure 8.3 A) Zone of Inhibition of E .Coli

Table .no.7 result of formulation batches F1, F2,F3F4

Test	F1	F2	F3	F4
Colour	Brown	Brown	Brown	Brown
Odour	Characteristic	Characteristic	Characteristic	Characteristic
pH	6	5.6	7.1	5.5
Foaming Test	5	7	6	5
Turbidity Test	005	007	003	004
Viscosity Test	8.6	8.5	8.7	7.5
Homogeneity	Homogenous	Homogenous	Homogenous	Homogenous

Results of stability tests of Herbal Mouthwash

Table .no.8. Results of stability tests

Temperature	Evaluation Parameters	Observation(months)			
		1	2	3	4
3-5 ˚C	Visual appearance	Light green	Light green	Light green	Light green
	Phase separation	Nil	Nil	Nil	Nil
	Homogeneity	Good	Good	Good	Good
Room Temperature (25 ˚CRH = 60%)	Visual appearance	Light green	Light green	Light green	Light green
	Phase separation	Nil	Nil	Nil	Nil
	Homogeneity	Good	Good	Good	Good
40 ˚C± 2 ˚C RH=75%	Visual appearance	Light green	Light green	Light green	Light green
	Phase separation	Nil	Nil	Nil	Nil
	Homogeneity	Good	Good	Good	Good

CONCLUSION:

As per above result of Herbal Mouthwash we comes to the conclusion that the use of Herbal Mouthwash of Rumex Vesicarius *is* suitable for mouth problem. As per the result and discussion in table no. 04: formulation of the Mouthwash, the F4 is comparatively good formulation then the others.

ACKNOWLEDGEMENT:

We are very thankful to the principal, Djps College of pharmacy, pohetakali dist parbhani, for providing facility for research work the special thank to Mr. Suryawanshi M.B for their guidance and support

REFERENCES

1. Mobashshera Tariq, Meghana Gore And ArunaK;Antibacterial And Synergistic Activity Of Ethanolic Ajwain (Trachyspermum Ammi) Extract On Esbl And Mbl Producing Uropathogens; Int J Pharm Pharm Sci, Vol 6, Issue 6, 278-284.
2. Muhammad Avesh Rafik Zaveri1, Mohammad Vaqqas Quraishi2, Muhammad Parvej Rafik Zaveri3, Tushar Sanjay Wankhede4, Yash Sanjay Surjuse;Formulation And Evaluation Of Herbal Mouthwash; International Journal of Engineering Development and Research.
3. Shafi Ahmad, Saloni Sinha, Smriti Ojha ,Hina Chadha, Babita Aggarwal, Ajeet, SeemaMahor Jain, Meenu ;Formulation and Evaluation of Antibacterial Herbal MouthwashAgainst Oral Disorders; Indo

Global Journal of Pharmaceutical Sciences, 2018; 8(2): 37-40.
4. Devyani Nigam *, Poojashree Verma and Mahavir Chhajed; Formulation and Evaluation of Herbal Mouthwash against Oral Infections Disease; International Journal of Pharmacy & Life Sciences Volume 11 Issue 7: July. 2020.
5. Sukanya S. Kad*, Priyanka A. Panmand, Pranali M. Lendave; Formulation and Evaluation of Herbal Mouthwash;International Journal of Pharmaceutical Research and ApplicationsVolume 9, Issue 4 July-Aug 2024.
6. Dr. Dipti G. Phadtare1, Prof Rohini P. Wagh2, Abhijit S. Hon3, Vaishnavi J. Kendre4, Aditya K. Gangurde5, Amol R. Mohan6, Sakshi R. Desai; Formulation And Evaluation of Herbal Mouthwash; Journal of Neonatal Surgery | Year: 2024 | Volume: 13.
7. Rote Shailesh, Tandale Kiran, Dhonde PS and KolheSD;A research paper on formulation and evaluation of herbal mouthwash; Journal of Pharmacognosy and Phytochemistry 2025; 14(2): 583-589.
8. Devyani Nigam ,Poojashree Verma and Mahavir Chhajed; Formulation and Evaluation of Herbal Mouthwash against Oral Infections Disease; International Journal of Pharmacy & Life Sciences Volume 11 Issue 7: July. 2020.
9. Bodake Ravina S1, Belhekar Archana B2, Bochare Vaishnavi K3,Vidhate Prajwal G4, Kumbhar Subhash T5;Formulation and Evaluation of Herbal Mouth Wash;International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)Volume 2, Issue 2, July 2022.
10. Ajay P. Patil, Md. Zuhaib Khan, Hemant K. Chaudhari;Formulation And Evaluation Of Herbal Oral Care Products Using Guava Leaves And Alum(Mouth Wash); Journal of Advance and Future Research.
11. Sukanya S. Kad*, Priyanka A. Panmand, Pranali M. Lendave; Formulation and Evaluation of Herbal Mouthwash;International Journal of Pharmaceutical Research and ApplicationsVolume 9, Issue 4 July-Aug 2024.
12. Mohammad M. Zarshenas1,2, Mahmoodreza Moein3,4, Soliman Mohammadi Samani5, Peyman Petramfar6;An Overview on Ajwain (Trachyspermumammi)Pharmacological Effects; Modern and Traditional; Journal of Natural Remedie.
13. Fathimathul Jennah Muhammad Kunhi, SargaRatheeshbabu Nair, Irshad Ahmad and Shagufta;Trachyspermumammi L. (Ajwain): Phytochemical composition and pharmacological applications development and insight; Journal of Medicinal Plants Studies.
14. Dr. B.Prathap,Periyanayagi.VNathisya.S, NandhiniPriya.P ,Nithish.K ,Prabha.V;An Overview Of Ajwain (Trachyspermum Ammi); Futuristic Trends In Pharmacy & Nursing.
15. Himani Singh | MurlidharMeghwal;Physical and thermal properties of various ajwain(Trachyspermumammi L.) seed varieties as a function ofmoisturecontent;Journal of Food Process Engineering .
16. Sara Raeisi a, Majid Sharifi-Rad b, Siew Young Quek c, BaharehShabanpoura,JavadSharifi-Rad;Evaluation of antioxidant and antimicrobial effects of shallot (Alliumascalonicum L.) fruit and ajwain (Trachyspermumammi (L.) Sprague)seed extracts in semi-fried coated rainbow trout (Oncorhynchusmykiss) fillets for shelf-life extension;LWT - Food Science and Technology.
17. Vaishnavi S. Kadam1, Tanvi I. Ambhire2, Yogesh J. Musale;Preparation And Evalution

Of Herbal Mouth Wash; International Journal Of Novel Research And Development.

18. Suraj HaridasKalyankar, 2bhakti Pravin Patil, 3priyanka KeruChakor, 4rahul C. Jagdale, 5chinmay R.Kapile;Formulation And Evaluation Ofherbal Mouthwash By Using Leafof Green Tea For Gingivitis; International Journal Of Novel Research And Development.
19. Shubh Jain, Saurabh Sharma, Dr. S.C. Mahajan, Prachi Maheshwari, MughisaNagoriMahakal Institute of Pharmaceutical Studies, UjjainRGPV, Bhopal, M.P.;Formulation Development and Evaluation of Polyherbal MouthwashContaining Psidium Guajava L; Journal of Biomedical and Pharmaceutical Research.
20. Helena Korpelainen1,2 & Maria Pietiläinen1; Sorrel (Rumexacetosa L.): Not Only a Weedbut a Promising Vegetable and Medicinal Plant ; Botanical Review.
21. Bharud HrutujaAntonbhaygudeRutujaDharmraj,Chaudhari Nikita Madhukar ,Chaudhari Shreya Balu,ChavanPratikshaVitthal;Formulation And Evalution Of Herbal Mouthwash; International Journal Of Novel Research And Development.
22. Ms. Dnyaneshwari K. Kurhe1, Ms. Chaitali M. Diwane; RumexAcetosa: A Comprehensive Review Of Its Ethnobotany, Chemistry, Pharmacology And Toxicity; International Journal Of Research Publication And Reviews, Vol (5), Issue (3), March (2024), Page – 6258-6266.
23. Shivani B. Shambharkar1 And Vinod M. Thakare2;Formulation And Evaluation Of Herbal Mouthwash; World Journal Of Pharmaceutical Researchvolume 10, Issue 9, 775-791.
24. Samiksha Tidke , Gaurav Kumar Chhabra , Priyanka P. Madhu , Amit Reche , SaeeWazurkar ,Shriya R. Singi; The Effectiveness Of Herbal Versus Non-Herbalmouthwash For Periodontal Health; Published Via DMIHER School Ofepidemiology And Public Health.
25. Preeti Chaudhary*, Raghavdeep Sharma, SayaliRupanar, Shwetajadhav, Atharva Bongade, Priyanka Shinde, SnehalGavit ; Preparation And Evaluation Of Herbal Mouthwash Containing Hydroalcoholic Extract Of PongamiaPinnata; Asian Journal Of Biological And Life Sciences, Vol 12, Issue 1, Jan-Apr, 2023.

HOW TO CITE: Divya Golait*, Prajakta Nikam, Ashwini Dongare, Shital Bhosle, Milind Suryawanshi, Dr. Ramesh Ingole, Formulation and Evaluation of Herbal Mouthwash of Rumex Vesicarius leaves extract, Int. J. of Pharm. Sci., 2026, Vol 4, Issue 6, 3446-3456. https://doi.org/10.5281/zenodo.20692113