

FORMULATION DEVELOPMENT AND EVALUATION OF HERBAL MOUTHWASH

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ABSTRACT : Herbal mouthwash defined as antiseptic liquid preparation for cleaning the mouth and teeth or freshening the breath. Herbal Mouthwashes are in high demand, because they act on oral pathogens and relieve the pain instantly and are also less side effective. Mouthwashes are help to prevent or reduce tartar, plaque and gingivitis (early-stage gum disease).selection of formulation is emulsion form. Herbal mouthwash formulated by primay data collection method by dentist. It is collected with the research project in mind, directly from primary sources. Neem oil, Clove oil, Tulsi oil using formulated of this herbal mouthwash. Nowadays the Neem extracts are used as antiseptic substance against inflammation of mouth. Clove oil is common ingredient in various dental creams, toothpastes, mouth wash, and throat sprays. Tulsi oil juice is applied in catarrhal bronchitis, indigestion, cold, cough, throat and chest troubles. comparative study included for antimicrobial growth inhibition by using cup-plate method. These liquid herbal mouthwash can work in long way to help people to get rid of bad breath and many oral disorders. Present study has an important impact in order to create an effective and inexpensive herbal oral health intervention for low social economic communities. The natural herbs used in present formulation have been medicinally proven to prevent the problem of oral hygiene and bad breath. Medicinal plants, plays vital role in curing diseases due to their antimicrobial and antifungal activity against human pathogens through decades. The stability study and *In – vitro* Antimicrobial study was showed satisfactory results. When we taken it for herbal mouthwash analysis, it shows best results. Also, it has high Antibacterial activity. No microbial growth was found in the respective formulation. The therapeutic effects of these herbal products and their role in improving oral health. 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. 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.

Keywords:- herbal, antimicrobial, gingivitis, physicochemical evaluation.

INTRODUCTION:

Herbal mouthwash defined as antiseptic liquid preparation for cleaning the mouth and teeth or freshening the breath. Mouth rinse, oral rinse, or mouth bath is a liquid which is held in the mouth passively or swilled around the mouth by contraction of the perioral muscles and movement of the head, and may be gargled and liquid bubbled at the back of the mouth.²

USES OF HERBAL MOUTHWASH

Mouthwashes are help to prevent or reduce tartar, plaque and gingivitis (early-stage gum disease). Some mouth rinse also contains ingredients to help whiten teeth. Mouthwash complements brushing and flossing. 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, plantain has ability for speed wound healing and many of the herbs contains anti-microbial, anti-inflammatory, antioxidants, antiseptic properties such as neem, clove, triphala with combination of amalaki, haritaki, vibhitaki, tulsi, celery, liquorice, oak tree, bakula, katha, spearmint, turmeric, and Aloe vera.⁴

Formulation of mouth wash

Following composition are use in mouthwash.

- a. Flavours Ingredients:- Peppermint, Menthol, Eugenol, Methyl salicylate.
- b. Compose by:- Diluents, antibacterial agent, soap, flavouring agents, Colorants.¹

RESEARCH METHODOLOGY :- A. Primary Data Collection

Primary data is **data that is collected by a researcher from first-hand sources**, using methods like surveys, interviews, or experiments. It is collected with the research project in mind, directly from primary sources. It is the most widely used primary data collection methods wherein the interviewer asks questions either personally, or through mail or

telephone from the respondents to obtain the insights of the problem under study. The researcher may either visit the respondent in person at his home or meet him at the central location as mutually decided by them. Primary data collection following steps

- Visited to Dentist
- Survey of Questionnaire
- Fill up form from Dentist
- After that survey trough analysed or collected various information
- And from Dentist suggestions through us prepared herbal mouthwash.

B. PLANT PROFILE:- 1. Neem Oil: The neem solutions are used in decreasing the inflammation of gums, to remove canker and against dental cavities. Nimbin was the first bitter compound isolated from Neem oil. Neem extract oil is appropriate for treating gingivitis and oral infections because it inhibits the formation of plaque and the growth of bacteria. Neem oil use as antibacterial, reduce ability of streptococci, bleeding gum had heals, pain relieving compound, avoid cavities, heal gum,etc.⁸

2.Tulsi Oil : Tulsi/Basil is used specially in the management of cough, Asthma, fever and common cold. Its useful in diseases of brain, heart, liver and spleen, strengths the gums and removes foul breath. It is diaphoretic, stomachic, laxative and is good for the treatment of fever.⁹

3. Clove Oil :- The importance of clove and clove oil and indicated that clove and clove bud oil can be used as an antimicrobial agent to cure dental caries. The antiseptic and germicidal benefits of cloves, they help fight infections like cold, flu, bronchitis, arthritic pain and athlete's foot. Clove and clove oil boost the immune system by purifying the blood and help to fight against various diseases.⁵

C. PHYTOCHEMICAL SCREENING¹⁰:- The oils were screened for the presence of acidic compounds, tannins, saponins, alkaloids, glycoside, steroids, proteins and amino acids, carbohydrates using various qualitative tests. All tests were performed as per standard procedure.

D. SELECTION OF FORMULATION: - Emulsion :- Emulsion is biphasic liquid preparation with two immiscible liquid. Liquid converted minute globule that's called as disperse phase. Liquid in which globule are dispersed that's called as continuous phase.⁹

Emulsifying agents:- Gum Tragacanth.

Type of emulsion:- oil in water (o/w) : Oil is dispersed phase. Water is continuous phase.

Advantage of emulsion:- its provide protection oxidation and hydrolysis.

E. PREPARATION OF HERBAL MOUTHWASH

Sr.no	Ingredients	Quantity
1.	Neem oil	0.01ml
2.	Clove oil	1ml
3.	Tulsi oil	0.01ml
4.	Stevia	0.14g
5.	Gum tragacanth	0.6g
6.	Peppermint oil	1ml
7.	Cinnamon oil	0.7ml
8.	Sodium benzoate	0.1g
9.	Methyl paraben	0.1g
10.	Propyl paraben	0.01g
11.	Eosin yellow	-

Formulation of Final batch

F. PROCEDURE :- Sugar and gum tragacanth added in mortar and pestle after that added preservative of sodium benzoate and propyl and methyl paraben after that added herbal ingredients of Neem oil, Clove oil, Tulsi oil and properly mix with clockwise or anticlockwise directions then formation of cracking sound then add upto 100ml of water and adjust pH with sodium bicarbonate and colouring agent also added.

G. PARAMETER FOR SELECTED OF 13TH FORMULATION

- ✓ Phase separation not found
- ✓ Flavour was good
- ✓ Taste was good
- ✓ Proper sweeten taste found
- ✓ Cracking sound form in emulsion
- ✓ Smell was good
- ✓ Texture was better
- ✓ Microbial growth not found in surrounding area
- ✓ Shows proper results of phytochemical screening

These formulated mouthwash fighting with bacteria and benefits of gingivitis without unpleasant aftertaste. Its less sensitive, less painfull to patients. it doesn't irritated. Its relief from halitosis (bad breath) or xerostomia (dry mouth). Childrens are not use before age of six. the range of mouthwash can be bewildering to new user, but as adult of all ages would benefits from using them and its important to find right one.

H. EVALUATION OF HERBAL MOUTHWASH

1. Colour and Odour: Physical parameters like odour and color were examined by visual examination.

2. Taste : The taste based on sweetness and sourness.

3. 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.

4. Degradation : The reduction of a chemical Compound to one less complex, as by splitting off one or more groups.

5. Viscosity : the state of being thick, sticky, and semi-fluid in consistency, due to internal friction.

6. Preservative content : A substance that is used for keeping oral formulations, etc. in good condition.

7. Phase dispersion : the phase in a two-phase system that consists of finely divided particles (as colloidal particles), droplets, or bubbles of one substance distributed through another substance.

8. Test for microbial growth in formulated mouthwash: The formulated mouthwash was inoculated in the plates of agar media by streak plate method and a control was prepared. The plates were placed in the incubator and are incubated at 37°C for 24 hours. After the incubation period plates were taken out and checked for microbial growth by comparing it with the control.

9. Stability Studies: Stability provide data of product storage requirements and expiration of dating. Its depends on environmental condition and effect on product quality. This is done in order to determine the physical and chemical stability of the prepared product and thus determine the safety of the product. A general method for predicting the stability of any product is accelerated stability studies, where the product is subjected to elevated temperatures as per the ICH guidelines. A short term accelerated stability study was carried out for the period of 3 months for the prepared formulation. The samples were stored at under the following conditions of temperature as 3-50 C, 250 C RH=60%, 400 C \pm 2% RH= 75%. Finally the samples kept under accelerated study were withdrawn on monthly intervals and were analyzed.

10. Comparative study (marketed and formulated formulation) : Comparative studies are the studies to demonstrate ability to examine, compare and contrast subjects or ideas. Microbial study completed by using Cup plate method or well diffusion metod.

RESULT AND DISCUSSION

Preformulation study:- Preliminary Phytochemical screening

Chemical test	Reagent test	Neem oil	Tulsi oil	Clove oil
Test for Carbohydrates	Molisch's Test	+ve	+ ve	+ ve
	Fehling Test	+ ve	+ ve	-ve
	Benedicts Test	+ ve	+ ve	+ ve

	Iodine Test	+ ve	+ ve	+ ve
	Tannic acid Test	+ ve	+ ve	+ ve
Test for Steroids	Salkowaski Test	+ ve	- ve	+ ve
	Libbermann's Test	+ ve	- ve	+ ve
Test For Protein	Biuret Test	+ ve	- ve	- ve
	Millon's Test	+ ve	- ve	- ve
Test For Amino acid	Ninhydrin Test	+ ve	- ve	+ ve
Test For Glycoside	Brontrager Test	+ ve	+ ve	+ ve
	Keller-killani Test	+ ve	+ ve	+ ve
	Legal's Test	+ ve	+ ve	+ ve
Test For flavonoids	Shinoda Test	+ ve	+ ve	- ve
	Sulphuric acid Test	+ ve	+ ve	- ve
Test For alkaloids	Mayer's Test	+ ve	+ ve	+ ve
	Hager's Test	+ ve	+ ve	+ ve
	Wagner's Test	+ ve	+ ve	+ ve
	Dragendorfff's Test	+ ve	+ ve	+ ve
Test For Tannins	Lead acetate Test	+ ve	+ ve	+ ve
	Dil.HNO ₃ Test	+ ve	+ ve	+ ve

and Phenolic compound	Bromine water Test	+ ve	+ ve	+ ve
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phytochemical screening

Microbial study result : The microbial study is important for purpose of checking microbial growth of prepared formulation, *S. aureus* strains were taken. There was no growth found around sampling area in the prepared formulation. Hence, the formulation was stable.



Figure 7.1 Antimicrobial activity

RESULT :- Herbal mouthwashes can temporarily mask bad odour and provide a pleasing flavor. Herbal mouthwashes with therapeutic agents like antimicrobials, however, maybe effective for some long term control of bad odour. These liquid herbal mouthwash can work in long way to help people to get rid of bad breath and many oral disorders. Present study has an important impact in order to create an effective and inexpensive herbal oral health intervention for low social economic communities. The natural herbs used in present formulation have been medicinally proven to prevent the problem of oral hygiene and bad breath. The mouthwashes have the ability to influence plaque formation and to alter the course of gingival formation due to their antibacterial, anti-inflammatory and cytostatic effects. Herbs are being widely explored to discover alternatives to synthetic antibacterial agents. Medicinal plants, plays vital role in curing diseases due to their antimicrobial and antifungal activity against human pathogens through decades. Herbal Mouthwashes are in high demand, because they act on oral pathogens and relieve the pain instantly and are also

less side effective. The herbal mouth washes are homemade hence it is of low expenditure whereas, the commercially available mouthwash is cost-effective. The herbal mouthwash has short shelf life when compared to chemical mouthwash but the storage of unsealed mouthwash may tend to invade the air microbes and other facultative anaerobes.

The formulated herbal formulation for dental patients were evaluated for phytochemical screening. The phytochemical screening performs for the individual oil and the herbal formulation. During phytochemical screening test for protein, carbohydrates, Eugenol, alkaloids, phenols and flavonoids was found to be present. The sensory evaluation, initial accelerated Stability, pH, Viscosity, Physicochemical Properties, Antimicrobial study assessment were performed. Moisture content of individual herb extract oil were found in range which shows better stability. The stability study and *In vitro* Antimicrobial study was showed satisfactory results. The stability studies were carried on the basis of ICH guidelines.

CONCLUSION: Safe and effective herbal formulation for dental problem patients was successfully formulated. Prepared formulation was selected for the further studies. When we taken it for herbal mouthwash analysis, it shows best results. Also, it has high Antibacterial activity. No microbial growth was found in the respective formulation. The therapeutic effects of these herbal products and their role in improving oral health. But still further research is required to know the dental benefits of herbal mouthwash being incorporated in to the commercially available dentifrices and other oral hygiene aids. The antibacterial activity of the mouthwashes at different concentrations was screened by Agar well diffusion technique. mouth rinse provides better results in its antimicrobial efficacy against *Streptococcus aureus*. 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. In these study herbal mouthwash had better antibacterial activity in comparison with Marketed mouthwash. The efficacy of herbal mouthwash was equally effective in reducing plaque and gingivitis as compared to marketed mouthwash and may be considered as a good alternative. The chemical mouthwash was reported with many side effects such as discoloration of teeth, altered taste sensation, mucosal irritation, parotid swelling, and enhanced supra-gingival calculus formation which limits its acceptability and long-term use, whereas the presently tested herbal mouthwash has no side effects apart from mild burning sensation. 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 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. 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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