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A Review On Herbal Mouthwash

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ABSTRACT

Oral health is important as overall health. Now-a-days people may faces more oral problems like periodontal disease, sore throat, gingivitis, plaque and so on.For maintaining good oral health various formulations are formulated. A mouthwash is recommended for controlling plaque, bad breath, toothache and bacteria. Herbal mouthwash are preferred over chemical mouthwash as it shows less side effects and is non-irritant, less toxic, and do not contain alcohol.

Medicinal plant plays a predominant role in curing and preventing diseases due to their antiviral and antimicrobial activity against human micro-organism. Herbal mouthwash are in high demand as compare to chemical mouthwash, because they act on pathogen and microbes and reduce the pain instantly and are also has no more side effects. In these preparation the herbs extract obtained from the leaves, fruits, flowers, bark and root of various plant.

KEYWORDS:-

Herbal mouthwash, natural extracts, antimicrobial, infectious diseases, oral cavity, tooth decay, oral hygiene, natural plants, gingivitis, antiviral, plaque.

INTRODUCTION:-

Mouthwashes are liquid which contain anti-inflammatory, antimicrobial, and analgesics action. Mouthwash is a remedy that s frequently used for its antiseptic, deodorizing and refreshing qualities as well as for plaque control. It should contain alcohol, glycerin, synthetic sweetness, surface-active agents, flavoring agents, coloring agents, etc. Mouthwash that kill 99.9% of the bacteria in your mouth are also killing off good bacteria.

A mouthwash Is a medicinal liquid dentifrice that is kept in the mouth and swished around by the perioral muscle to remove oral germs.Oral hygiene is its primary function.

Mouthwash is a remedy that is frequently used for its antiseptic, deodorizing, and Refreshing qualities as well as for plaque control. It Must include ingredients like glycerin, artificial Sweeteners, surface-active agents, flavorings, and Colors

Herbal mouthwashes are designed and prepared with extracts and essential oils from phyto-therapeutic plants, containing a mixture of active agents such as catechins, tannins and sterols. Herbal mouthwash becomes more popular they work without alcohol, artificial preservatives, flavors and colors.

WHEN WAS MOUTHWASH INVENTED?

In this late1800's, mouthwash was created. When toothpaste was created in the 1800s, oral care products as we know them now first entered the market. In the late 1800s, mouthwash was first- mass produced for commercial purposes. Most early mouthwash brands contained alcohol to stabilize the formulation, but nowadays, alternatives, such as cetylpyridinIum chloride (CPC), offer germ-killing qualities without the requirement for alcohol stabilization. Numerous healthcare product contain CPC; nevertheless, the effectiveness of each product's composition in eradicating germs that produce plaque and gingivitis varies.

Who made mouthwash popular?

Dr. Lawrence invented Listerine, a mouthwash intended to sanitize surgical incisions and clean lips, in 1879. By 1895, Lambert Pharmaceutical CO. purchased Listerine and dentists started using it.

Mouthwash can be used in the following cases:

1. Gum disease
2. Mucositis
3. Halitosis
4. Periodontal disease
5. Xerostomia
6. To clean septic sockets
7. To control plaque
8. To relive pain
9. To effectively delivered fluoride to prevent dental caries
10. Reduce inflammation
11. Breath freshner

ADVANTAGES:-

1. Fresh breath.
2. Reducing tooth decay using sodium fluoride.
3. Reducing gum inflammation by killing bacteria.
4. Whitening teeth using a bleaching agent.
5. Preventing gum disease using an antiseptic or anti-plaque ingredient.

6. Mouthwash prevents gingivitis and gum disease by killing the bacteria that would otherwise infect the dental sockets and gums.

7. It can prevent a buildup of plaque, strengthen the enamel and de-mineralize your teeth, allowing you to prevent tooth decay.

DISADVATAGES:-

1. It should be used only as an adjunct to mechanical plaque control.

2. It does not remain in the mouth for long time.

3. Certain mouthwashes contain high level of alcohol ranging from 18-26%.

4. This may produce a burning sensation in cheeks, teeth and gums.

5. Herbal drugs have slower effects as compare to Allopathic dosage forms.

6. It requires long term therapy.

7. They are difficult to hide taste and odor sometimes.

BENEFITS OF HERBAL MOUTHWASH:-

1. Clean whole mouth.
2. Kills bad breath germs.
3. Helps to prevent cavities.
4. Quick relief from mouth ulcers.
5. Improves gum health.
6. Fight gum diseases.
7. Freshnes to the breath.

TYPES OF MOUTHWASH:-

1. **Natural mouthwash**:- Natural mouthwash could also be a mouth wash that does what others sorts of mouthwash do except the ingredients are natural. It is also a popular option as an alcohol free mouthwash. Their ingredients are safer to use as compared to other sorts of mouthwash. Three of the most commonly used essential oils in natural mouthwash and other natural mouth care product are peppermint, cinnamon and lavender. Research has proven the efficacy of their antibacterial, antimicrobial and anti-inflammatory properties.

2. **Antiseptic mouthwash**:- This is the foremost common mouthwash. This mouthwash usually contains alcohol and is typically utilized by people with mouth infection to stop bacterial growth. This is often also helpful for people that have halitosis or bad breath. This is often used alongside the proper brushing of teeth and flossing to help forbid bacteria that causes mouth infections and stinky breath.

3. **Fluoride mouthwash**:- Fluoride in mouthwash contain salt which helps protect the teeth cavities and cavity. Since fluoride could also be found in toothpaste and water, it's advisable to require care when using this type of mouthwash since intake of an excessive amount of fluoride isn't good for your overall health.

4. **Cosmetic mouthwash**:- A mouthwash that doesn't really do anything to your overall oral care but is just how to freshen your breath or to mask bad breath. Cosmetic mouthwash are utilized for short-term relief of bad breath or unpleasant mouth feel.

Uses of mouthwash:-

1. The use of mouthwashes requires a correct diagnosis of the oral condition and a through knowledge of the product.
2. Mouthwashes should only be used for short periods of time and should never be the sole means of oral hygiene.
3. It can be used in the following cases:
    - Halitosis
    - Mucositis
    - Periodontal Diseases
    - Gum diseases
    - Xerostomia
    - To clean septic sockets
    - To relieve tooth pain
    - Reduce inflammation
4. Mouthwash provides that sense of freshness while controlling breath odor, it not only freshens your breath but also work to kill the bacteria that causes it.
5. It can be used to control bad breath and reduce cavities.
6. It can also help to improve conditions such as dry mouth, gingivitis, receding gums and plaque build up.

ORAL DISEASES:-

1. DENTAL CARIES:

Caries is the most typical oral infection and illness. A persistent, contagious illness called caries is brought on by bacteria that consume sugar to generate an acidic environment that erodes teeth. These process causes holes in the tooth's structure over time. Streptococcus mutans is the main bacterium implicated, but the disease may be caused by the breakdown of complex biofilm on the teeth rather than an abundance of one particular species.

2. CANDIDIASIS:

A candida species infection of oral mucosa is known as candidiasis. Candida albicans is the type of candida that affects people most frequently. Risk elements species of candida are typical dweller of the digestive system.

Oral candidal infections are more common among immune-compromised people, such as a elderly, young children, HIV-positive people, cancer patients, diabetics, and people with glucose intolerance. People who take certain treatments, such as chemotherapy, inhaled steroids, broad spectrum antibiotics (which alter the body's usual defensive flora) and antibacterial therapy are more susceptible. Additionally, dentures may develop a Candida infection, leaving the surrounding skin erythromatous rather than white.

3. GINGIVITIS:-

An reversible form of gingival inflammation of gingivitis. A gentle form of periodontal diseases, that there are three classification :-plaque-induced, non-plaque-induced and systemic diseases and medication-induced gingivitis. Emergence and dental equipment (braces, dentures) are risk factors for gingivitis.

4. MOUTH ULCER:-

Mouth ulcers are small sore that form on gums, lips, inner cheeks or palate (roof of mouth). They can triggered by several different factors, including minor injuries, hormonal changes and emotional stress. Mouth ulcer aren't contagious and they go away on their but there are treatments to help ease pain and discomfort.

HERBS USED AS MOUTHWASH :-

1. Peppermint:

Peppermint incorporates high menthol content, and is usually used as tea and for flavouring dessert, confectionery, chewing gum, and toothpaste. The oil also contains menthone and methyl esters, particularly methyl acetate. It is the oldest and preferred flavor of mint flavoured confectionery. Peppermint could also be used in shampoos and soaps, which give the hair a minty scent and gives a cooling sensation on the skin seasoner is flexible oil: it's analgesic, anti-inflammatory, anti-viral, digestive, anti-septic, an astringent, carminative and anti-spasmodic Peppermint, essential oil is used to treat migraine, bronchitis, sinusitis, indigestion, nausea, irritable bowel syndrome, irregular periods and nervous conditions. It is also very useful within the treatment of cold & flu.

2. **Clove**:

Cloves are used as a carminative to increase acid within the stomach and to spice up peristalsis. Cloves are said to be a natural anthelmintic. The essential oil is used in aromatherapy when stimulation and warming are needed, especially for gastrointestinal systems problems. Topical application over the stomach or abdomen are said to warm the canal. Clove oil, applied to a cavity during a decayed tooth, also relieves toothache.

3. Ajwain:

Ajwain is used as an antiseptic. It's used for cleaning wounds and treating skin infections. Oil of Ajwain is additionally utilized in toothpaste and perfumery. Ajwain leaves is crushed and applied on infections. Ajwain seeds are utilized in prevention of bad breath. Thymol from Ajwain seeds is additionally utilized in various mouthwashes. Regularly chewing of Ajwain seeds alongside fennel seeds prevents bad breath.

4. Neem:

The leaves, twigs, and seeds of neem have been used in India and South Asia to clean the teeth and fight bacterial and fungal infections. Neem extract gel is appropriate for treating gingivitis and oral infections because it inhibits the formation of plaque and the growth of bacteria.

5. Tulsi:

Tulsi/Basil in Ayurveda having many medicinal properties and a wide therapeutic range. The leaves are quite effective for the ulcer and infections in the mouth. The anti-inflammatory and anti-infectious properties of Tulsi make it a powerful treatment for gum disease. The leaves are quite effective for ulcer and infections in the mouth. It is also useful in pyorrhea and other gum disorders. The anti-inflammatory and anti-infectious properties of tulsi make it a powerful treatment for gum disease.

6. Turmeric:

Turmeric mouthwash (10mg curcumin extract dissolved in 100 ml of water with a peppermint flavoring agent added was found to be as effective as a solution made from chlorhexidine gluconate (CHX), the gold standard compound for plaque build up in dentistry.

7. Green Tea:

It can be used as a gargle or mouthwash to treat dental decay, halitosis, laryngitis, mouth sores, plaque formation, sore throat, thrush, and tonsillitis. It effectively reduces plaque accumulation and is free from side effects as of chemical mouthwashes.

8. Guava Leaves:

Chewing fresh guava leaves also stops bleeding from gums alongside bad breath. Most mouthwashes contain antimicrobial substances as antiseptic ingredients to deal with germs that commonly cause mouth infections. Phytochemical studies shows the guava leaves bioactive components like tannins, tri terpenes, phenols, flavonoids, essential and stuck oils, sapinins, lectins, carotenoids, etc.

Pomegranate:-

The pomegranate extract shows effective decrease of pathogens in chronic periodontal disorder7. Pomegranate juice intake can inhibit viral infection while its extract has antibacterial activity.Active compounds has anti-inflammatory properties that helps in soothe irritated tissues and has potential to suppress the microorganism from adhering to surfaces of the tooth.

LITERATURE SURVEY:

1. **Renuka S. et.al (Year 2016)** :-

Objective: To discuss the benefits of herbal mouthwashes with the standard chlorhexidine mouthwash. This review is conducted to explore the benefits of herbal mouthwashes.

Methods: Many herbal extracts are now available as mouthwash for maintaining the good oral hygiene. Plaque accumulation and increase in oral microorganisms are the main factors for poor oral hygiene. Herbal extracts such as German chamomile, Terminalia chebula, Aloe vera, Green tea, peppermint satva, turmeric, neem, triphala, pomegranate extracts, guava extract, propolis, alum, darim leaves, mulethi, etc., are similar to chlorhexidine in plaque control and gingivitis reduction. Many herbal mouthwashes contain herbs with anti-microbial property such as neem, yavani satva, nagavalli, Gandhapura taila, pilu, Bibhitaka, Ocimum, Echinacea, Chameli leaves, etc. Many herbs are with anti-inflammatory and anti-oxidant property such as neem, clove, triphala, tulsi, grapefruit, celery, licorice, katha, spearmint, and chamomile essential oil.

Result: Though herbal mouthwashes has the ability to maintain good oral hygiene on daily basis, but still it is less effective than chlorhexidine mouthwash during treatments like gingivitis, periodontitis, trauma, etc.

Conclusion: Besides the disadvantages, chlorhexidine mouthwash plays effective role during dental treatments on short term usage. Herbal mouthwashes are suitable for maintaining good oral prophylaxis. Many programs have to be conducted to make them aware about mouthwashes in their oral hygiene.

2. **Devyani Nigam, et.al (Year 2020) :-**

Medicinal plants, plays a predominant role in curing and preventing diseases due to their antiviral and antimicrobial activity against human microorganism. Herbal Mouthwash are in high demand as compare to chemical mouthwash, because they act on mouth pathogen and microbes and reduce the pain instantly and are also has a no more side effects. The most commonly infectious diseases cause by a many pathogens and microbes are Dental carries and periodontal diseases at different stages of their life time. The aim of present work is to formulate and to evaluate its effectiveness against microbes present in oral cavity. The four herb Azadirecta indica (neem), Mentha longifolia (mint), Syzgium aromaticum (clove) and Ocimum sanctum (tulsi) were selected for mouth wash and Prepared formulation was further evaluated for physical properties like pH, color and stability. The present mouthwash possesses a good antibacterial property. This preparation is stable in

different temperature condition Present mouthwash is a liquid preparation which normally contains antibacterial and antiseptic agents. These solutions can be used to reduce the microbial growth and it reduces infection in the oral cavity.

3. Abhishek D. Purohit, et.al (Year 2022) :-

Medicinal plant or herbs are considered to have rich source of ingredients which can be used in drug development. They can prevent and cure disease because of their antimicrobial and antibacterial property against microorganisms. The main objective of this literature work is to prepare and evaluate a herbal mouthwash and check its effectiveness against microorganisms of oral cavity. To prepare Antibacterial herbal Mouthwash from aqueous extract of 7 different Herbs namely Azadirachtaindica (Neem), Ocimum bacilicum (Tulsi), Menthalogifolia (Mint), Curcuma longa (Turmeric), Syzygiumaromaticum (Clove), Glycyrrhizaglabra (Liquorice), Cinnamomumverum (Cinnamon). That act against the oral Staphylococcus aureus,E.coli and to check the antimicrobial activity by using Agar well diffusion method. The medicinal plants which were suitable were collected and their water soluble extracts was prepared. 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 prepared mouthwash and it possesses a good antibacterial activity. The current mouthwash is liquid formulation with potent action.

4. Aaditi R. Ingale, et.al (Year 2023) :-

The mouth is said to be home of various bacterial organisms. But some of these organisms are harmless and there are certain organisms that are harmful which may cause oral plaque, bad breath and mouth disease. Thus maintaining a good oral hygiene is essential for healthy mouth and body. Herbal mouthwash preparations are the type's mouthwash which is prepared from the herbs extract .Herbal mouthwash has major advantage over the chemically prepared mouthwash due to their non-irritating, non-staining properties which do not content alcohol. In this preparations the herbs extract are obtained from the leaves, fruit, flower, bark, and root of various plants. In this review we have highlighted different herbal drugs which can be used effectively in mouthwash formulation with minimal side-effects.

5.Priyanka Namdeo, et.al (Year 2021) :

Worked on formulation and evaluation of herbal antibacterial mouthwash and to evaluate its effectiveness Against microbial load of oral activity. Prepared mouthwash further evaluate for its physicochemical of Properties and antimicrobial activity. They act on mouth pathogens, microbes and reduces the pain Instantly and also has no more side effects.

FORMULATION OF HERBAL MOUTHWASH:-

Formulation Table No. 1 :-

Sr. No.	Ingredients	Functions	Formulations		
			F1 (mg)	F2 (mg)	F3 (mg)
1	Neem	Active drug	250	500	1000
2	Tulsi	Active drug	250	500	1000
3	Clove oil	Active drug	0.1ml	0.15ml	0.20ml
4	Mint oil	Flavor	0.1ml	0.1ml	0.1ml
5	Saccharin	Sweetener	0.1mg	0.1mg	0.1mg
6	PEG 40	Surfactant	6 gm	6 gm	6 gm
7	Glycerol	Co-surfactant	6.5ml	6.5ml	6.5ml
8	Alcohol	Preservative	2 ml	2 ml	2 ml
9	Purified water	Up to 100 ml	Up to 100 ml	Up to 100 ml	Up to 100 ml

Formulation Table No. 2

Sr. no.	Ingredients	Botanical Name	Role	Quantity
1	Turmeric	Curcuma longa	Antibacterial	1ml
2	Neem	Azadirachta Indica	Antimicrobial	2 ml
3	Tulsi	Ocimumtenuiflorum	Dental care	4 ml
4	Mint	Mentha	Antimicrobial, Flavouring agent	2 ml
5	Clove	Syzygiumaromaticum	Anti inflammatory	1.5 ml
6	Cinnamon	Cinnamomumverum	Sweetening agent	2.5 ml
7	Liquorice	Glycyrrhizaglabara	Antibacterial	1 ml

Formulation Table No. 3:-

Sr. no.	Ingredients	Uses	F1	F2
1	Tulsi extract	Antibacterial, antiseptic	10 ml	10 ml
2	Liquorice powder	Sweetening agent, Expectorant	1.80gm	2 gm
3	Cinnamon oil	Antibacterial, flavouring	0.1 ml	1 ml

4	Mentha peprita oil	Antibacterial	5 ml	2 ml
5	Glycerol	Co-surfactant	6.5 ml	6.5 ml
6	SLS	Surfactant	3 gm	1 gm
7	Alcohol	Preservative	2 ml	1 ml
8	Water	Up to 100 ml	-	-

Formulation Table No. 4:-

Sr. no.	Ingredients	Functions	Percentage (%)
1	Tulsi extract (ocimum santum)	Atimicrobial, anti-inflamatory	2.0%
2	Green Tea extract (camellia sinensis)	Preventing gingivitis	2.0%
3	Nagarmotha extract (cyperus rotundus)	Flavouring agent	1.0%
4	Cinnamon oil	Bactericidal	0.2%
5	Clove oil	Analgesic, anti-inflammatory	0.2%
6	Menthol	Freshner, Flavouring agent	0.04%
7	Vitamin E	Antioxident	0.015%
8	Glycerin	Emulsifying agent	4.0%
9	Distilled water	Vehicle	q.s

Extraction Process of Crude Drugs:-

[A]. Extraction Process of Tulsi :-

(1). Collect plant material and dry it if required.

(2). Fill this plant material in distillation vessel.

(3). Add water or solvent (like Ethanol, n-Hexane) in distillation vessel.

(4).Heat the mixture in well-equipped distillation vessel in control environment and controlled temperature, then

(5). Diffusion of essential oil from inside of solid material of plant to its surface occurs, then

(6). Transfer of mass from surface of plant solid material to surrounding liquid occurs, then

(7). This liquid contains essential oil which is obtained by reverse cooler.

(8). Then the collection of above liquid obtained from reverse cooler is put to stand for some time then essential oil come over water, then

(9). We separate layer separation to separate out essential oil from water, then

(10). Store this essential oil in dark, closed vessel for future use.

[B]. Extraction Process of Turmeric :-

(1). The rhizomes of turmeric were dried in oven at 105 degree C for 3 hours.

(2). Dried rhizomes were triturated using mortar and screened through a sieve with mesh 80 to obtain uniform powder with particle size 0.18 mm.

(3). The turmeric powder was stored in refrigerator to prevent moisture uptake.

(4). The Soxhlet extraction, as the reference method, was performed as follows:15g ground turmeric powder was weighted and embedded in a thimble and put in the soxhlet apparatus which was gradually filled with acetone as the extraction solvent.

(5). The extraction experiment was carried out at 60 degree C.

(6). The residue was dried and weighed; then dissolved in 10 ml methanol for calculation of curcumin content using HPLC.

(7). In all extraction experiments acetone was used as the extraction solvent due to its high solubilization capacity.

[C]. Extraction Process of Neem leaves :-

(1). 50 gm of neem leaf powder was mixed with 500 ml of distilled water and boiled for about 30 min.

(2). The boiled solution was filtered using Whatman No. 1 filter paper and clear aqueous leaf extract was obtained.

[D]. Extraction Process of Cinnamon:-

(1). 100g of cinnamon stick were mashed into smaller pieces and placed inside a thimble made from thick filter paper, which was then loaded into the main chamber of the Soxhlet extractor.

(2). The extraction solvent used was ethanol. The solvent was heated to reflux at temperature above 100℃ for 5 and 10 hours. After the extraction, the products were collected and purified using rotary evaporator at fixed temperature 50℃.

(3). After rotovap, the samples were left under fume hood for one hour to make sure all the ethanol left in the oil crude was completely vaporized to the environment.

[E]. Extraction Process of Green Tea :-

(1). Maceration- About 100 g of tea powder, defatted previously was macerated with 200 ml of ethanol in an Erlenmeyer flask for 6, 12, 24, 48 hours respectively.

(2). Soxhlet extraction- 100g of defatted green tea powder was subjected to Soxhlet extraction using 200 ml of ethanol in an Erlenmeyer flask as solvent. The extraction process was carried out at a temperature ranging from 60-70ºC until the tea powder gets completely exhausted.

Evaluation of herbal mouthwash

1. Color and Odour: -

Physical parameters like odour and color were test by visual examination.

2. pH:-

pH of prepared herbal mouthwash was measured by using digital pH meter, the pH meter was calibrated using standard buffer about 1 ml of mouthwash was weighed and dissolved in 50 ml of distilled water and its pH was measured by pH meter.

3. 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.

4. Stability Studies:-

The formulation and preparation of any product is incomplete without proper stability studies of the prepared 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 ±2% RH= 75%. Finally the samples kept under accelerated study were withdrawn on monthly intervals and were analyzed.

5. In vitro antibacterial activity:-

In vitro antibacterial activity was performed on isolated colonies of Streptococcus mutans. The Agar well diffusion technique was used for determining the zone of inhibition and minimum inhibitory concentrations (MIC). The strains of S. mutans were inoculated in prefabricated blood agar plate. Plates were dried and 4 wells were made with the help of 6 mm agar well cutter. 20µl, 40µl, 60µl, 80µl of prepared mouthwash was loaded in all the respective wells. The agar plates were kept undisturbed to allow the passive diffusion of herbal mouth wash into the agar culture medium. Then the plates were incubated at 37°C for 24 hours. The zone of inhibition was calculated in mm.

Conclusion

The formulation and evaluation of herbal mouthwash present a promising avenue for oral care. The reviewed literature underscores the potential benefits of incorporating herbal ingredients, highlighting their antimicrobial, anti-inflammatory, and antioxidant properties. While challenges in standardization and efficacy assessment exist, research indicates that herbal mouthwashes can be effective alternatives to conventional products. Further studies and clinical trials are warranted to establish robust formulations, dosage regimens, and long-term effects. Embracing herbal mouthwashes may contribute to a more natural and holistic approach to oral hygiene, fostering a shift towards sustainable and plant-based solutions in dental care.

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