



Formulation of Mouthwash Using Jatropha Curcas latex for the treatment of mouth ulcer

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ABSTRACT:

to create and assess a herbal mouthwash with latex from *Jatropha curcas*. It is used in the human oral cavity, which is covered in a variety of gram positive and gram negative bacteria, including *Lactobacillus*, *Streptococcus mutans*, *Porphyromonas gingivalis*, and *Staphylococcus*. These bacteria can cause a variety of tooth problems, including decay, gingivitis, sensitive teeth, root infections, and so on. The current study created a mouthwash formulation with antibacterial activity on mouth ulcers that is both comfortable and easily applied.

An ethanolic latex extract was prepared for mouthwash by employing the Soxhlet extraction method. Alkaloids found in *J. Curcas* latex are primarily responsible for the mouthwash's effectiveness. Three batches of formulation and evaluation were carried out in order to identify the presence of alkaloids. Three mouthwash formulations, each with a different color, smell, pH, and stability study, were made using latex from *Jatropha curcas*, mentha oil, tween 20, glycerine, turmeric, and clove powder, among other ingredients. An ethanolic latex extract was prepared for mouthwash by employing the Soxhlet extraction method. Alkaloids found in *J. Curcas* latex are primarily responsible for the mouthwash's effectiveness. Three batches of formulation and evaluation were carried out in order to identify the presence of alkaloids. Three mouthwash formulas were

Herbal medications are commonly used since they are quite effective when compared to chemical products. Since the primary goal of the current study is to develop and assess a herbal mouthwash, the *Jatropha curcas* plant, which is a member of the Euphorbiaceae family, was the subject of this research paper. Herbal mouthwash can be used alongside other dental care procedures, such as flossing and brushing. Herbal mouthwash is highly sought after because of its robust ability to combat oral pathogens, as well as its quick analgesic properties and minimal adverse effects.

KEYWORDS: *Jatropha curcas* latex, curcain, mouthwash, mouth ulcer, oral hygiene, antibacterial activity, gram positive and gram negative bacteria.

I. Introduction:

Mouth ulcers are excruciating mucosal lesions that typically occur on the tongue, gums, cheeks, or lips of the oral cavity. Anywhere inside your mouth can develop a sore called a mouth ulcer. You may have one or more of these sores, which are often red, yellow, or white in color. Even if the lesion is benign and self-healing, mouth ulcer pain and discomfort interfere with speaking, eating, drinking, brushing, and even breathing, which lowers the patient's quality of life and productivity. Although the precise etiology of mouth ulcers is unknown, factors such as stress, mucosal integrity, antigen sensitivity, genetic susceptibility hormones, and nutritional inadequacies are likely linked to their formation.

The treatment of mouth ulcers is basically symptomatic, with the purposes of alleviating pain, shortening healing time, reducing ulcer area, reducing recurrence rate, and increasing disease interval. Currently, treatment methods mainly include systemic and topical corticosteroids, antibiotics, vitamin B complex, adhesives, topical antiseptics, analgesics, anti-inflammatory agents, mouthwashes with active enzymes, cautery, and photo biomodulation. Infection and vitamin B deficiency have been reported as possible contributing factors in mouth ulcers. Vitamin B, a micronutrient essential to the human body, can be obtained by dietary modification or drug treatment.

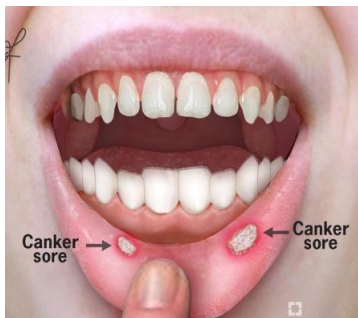
Vitamin B therapy for mouth ulcers is a worthwhile therapeutic suggestion because of its cheap cost of care benefit. The purpose of this meta-analysis was to learn more about the therapeutic effectiveness of vitamin B in the treatment of mouth ulcers.



Types of mouth ulcer:

There are many different types of mouth sores and lesions, including: These are the most prevalent kind of oral ulcers. It's unclear to medical professionals exactly what causes them or why some people experience them more frequently than others. Acidic meals and mild trauma (such as biting your cheek) are among the causes.

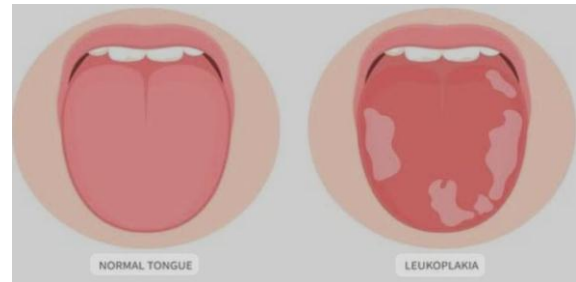
1. Canker sores (aphthous ulcers).



Oral lichen planus. White, lace-like lesions inside your mouth and itchy rashes are possible symptoms of this illness. The immune system's reaction known as oral lichen planus typically affects women and those classified as female at birth (AFAB) who are 50 years of age or older.



Leukoplakia. White or gray patches inside your mouth are a symptom of this illness. It arises from overabundance of cell division. It can be brought on by long-term irritation from things like chewing tobacco or smoking. However, occasionally it occurs for no apparent reason. Lesions from leukoplakia are typically not malignant.



Erythroplakia. Another sign of tobacco use, whether by smoke or chewing, is erythroplakia. Individuals with erythroplakia have red areas under their tongue or between their teeth. Erythroplakia patches, in contrast to leukoplakia lesions, are typically malignant or precancerous.

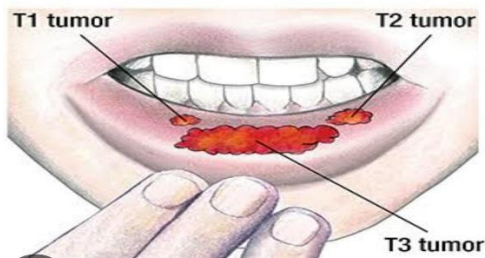


Oral thrush. This fungal infection inside your mouth is caused by an overabundance of yeast called *Candida albicans*. It frequently occurs after receiving antibiotics or when your immune system isn't functioning at its peak. Red, creamy white patches and ulcers on the mouth are a symptom of oral thrush.





6. Mouth cancer. Red or white mouth sores or ulcers might be symptoms of oral cancer lesions. The sores here won't go away by themselves. Inform your healthcare physician if, after three weeks, your mouth ulcer hasn't healed.



Symptoms of mouth ulcer:

- Mouth ulcers are usually easy to spot. They appear as sores on your gums, tongue, inner cheeks, inner lips or roof of your mouth. Mouth sores are typically:
 - Red around the edges.
 - White, yellow or gray in the center.You may only develop one ulcer, or there might be more. Other symptoms could include:
 - Swelling around the ulcers.
 - Increased soreness when brushing your teeth.
 - Pain that worsens when eating spicy, salty or sour foods.

causes mouth ulcers

Mouth ulcers can result following a variety of dental procedures, such as:

- Minor tissue damage from filling a cavity.
- Biting your tongue or cheek by accident.
- An allergic response to specific microorganisms.
- Using retainers or braces.
- Making use of abrasive or harsh toothpaste.
- Consuming a lot of acidic foods, like strawberries, pineapples, and oranges.
- Changes in hormones when you get your period.
- Anxiety • Insufficient sleep

Treatment for cure mouth ulcer

How are mouth ulcers treated? Although the majority of mouth sores heal on their own, your doctor could recommend medication to help reduce pain. Treatments for mouth ulcers that are frequently used include antiseptic mouth rinses or gels like Anbesol® or Orajel™. steroid creams such as triamcinolone. immunosuppressants—in extreme circumstances.

Remedy to cure mouth ulcers fast naturally

Additionally, there are things you can do at home to reduce the symptoms of a mouth sore: Sip a lot of water.

Maintaining optimal oral hygiene is essential for maintaining a clean mouth.

Several times a day, rinse your mouth with warm saltwater.

Rinse your mouth twice a day with a combination of equal parts hydrogen peroxide and water.

Mouthwash :Mouthwashes, also known as oral rinses, mouthrinses, mucositis, dentistry caries, halitosis, gingivitis, periodontitis, and mouth washes, are liquid, aqueous compositions primarily designed to prevent, relieve, and cure oral conditions and maintain oral health.

There are three types of mouthwash available: fluoride mouthwashes, which serve to strengthen the fluoride layer on tooth enamel, and antibacterial products, which are used to reduce the population of bacteria. The mouthwash worked to get rid of the bad breath in two ways: first, by eliminating the bacteria that were causing it, and second, by covering up the stench. In dentistry, the use of antimicrobial mouthwashes as chemotherapy supplements to mechanical oral hygiene regimes has gained a lot of traction.

In actuality, mouthwash made from *Jatropha curcas* latex was an improvement above previous dental solutions. For therapeutic purposes, mouthwash can treat illnesses caused by toothaches and oral infections.

The primary medication used to make mouthwash is: Latex of *Jatropacurcas*. According to Suhaili et al. (2011), *Jatropha curcas* is a drought-resistant tree in the Euphorbiaceae family. A common shrub in tropical regions is *Jatropha curcas*, which belongs to the Euphorbiaceae family. It truly originated in Central America, and Portuguese seamen transported it to countries in Africa and Asia via the Cape Verde Islands (Henning, 2000). Historically, several parts of this plant, including the leaves, roots, seeds, latex, etc., have been utilized for a variety of uses, including the medicinal purpose. According to Dalziel (1995), there are several ethnomedical applications for the extract of *Jatropha curcas* leaves and roots, such as treating cancer, acting as an abortifacient, antiseptic, diuretic, purgative, and hemostatic. The plant's nut has also historically been used to treat a variety of illnesses, such as burns, convulsions, fever, and inflammation. *Jatropha white latex*, which is composed of



alkaloids, is also used as a disinfectant for pediatric oral infections. The latex from *Jatropacurcas* morphology:

Jatropacurcas is a tiny tree or perennial that can grow up to 6 meters high. Its pale brown, peeling bark is papery and emits a plentiful amount of liquid latex that is soapy and rough at first, but soon becomes brittle and brownish when dried. The branches are hairless and climb steadily.

Stem: It has been demonstrated that stem latex possesses coagulant activity, and that the precipitation of coagulant components is how it acts as a hemostatic agent. However, numerous tests should be conducted and the safety level should be established in order to confirm and validate the potential use of *Jatropha* latex for the creation of mouthwash or in the dentistry industry in general

Leaves: There is a great deal of morphological variety in leaves. The leaves typically have three to five lobes with a spiral phyllotaxis, are green to pale green in color, and alternate to subopposite

Flowers: On a single inflorescence, male and female flowers are produced at a ratio of 20 male blooms to every female flower. or ten male flowers for every one female. The leaf axil is where the

inflorescence may form. Sometimes, plants display hermaphrodite blooms.

Fruit :Winter is when fruits are produced, although if the soil is well-moisturized and the temperature is high enough, there may be multiple crops throughout the year. With differences in production peaks, some plants have two or three harvests while others produce consistently throughout the season. The majority of fruit production is concentrated from midsummer to late fall.

Seeds:When the capsule turns from green to yellow, the seeds are ready. The seeds generate 25–40% oil by weight, with 20% of their fat content being saturated and 80% being unsaturated. Other chemical substances found in the seeds include protein, glucose, fructose, galactose, raffinose, stachyose, and saccharose. The main components of the oil are linoleic and oleic acids. In addition, curcin, arachidic, myristic, palmitic, and stearic acids are also present in the plant.

Bark: used as a toxin for fish. There is HCN. The potential broad range antibacterial activity of *J. curcas* bark extract was established by Igbiosa and colleagues (2009)

Latex:suppresses the watermelon mosaic virus very effectively.

Table no.1 :MODE OF ACTION:

- antibacterial activity was determined using Gram positive and negative strains



- the antifungal activity was determined using yeast and filamentous fungi, and the wound healing efficacy of the latex.



Alkaloids found in the latex of *Jatropha*, including jatrophine, jatrophen, jatrophore, and curcain, have historically been used as antibacterial or wound-healing agents in addition to being anticarcinogenic.



- The latex is used to dress sores, ulcers and inflamed tongues.



- The latex contain alkaloids shows antibacterial activity against gram positive and gram negative bacteria.



II. MATERIAL AND METHOD:

Plant collection and authentication:

Latex was obtained from the cut stalk leaves and young stem of *Jatropha curcas* and stored in sterile tube with protection from light.

Bleeding method and latex production:

Latex productivity was measured by collecting this material from the selected trees, using two collection methods (F and R). The F method is characterized by a vertical 10-cm cut in the stem made with a knife. For the R method, a 3 to 5-cm vertical cut is made in the branch, also with a knife. Both cuts were 0.5 cm deep.

The productivity of each plant was determined according to the volume of latex obtained from bleeding in the different experiments. Bleedings were performed once a month for ten months, on a rainless day, starting at 6 a.m. and ending at around 8 a.m. Temperature, humidity and rainfall were measured monthly.

Preparation of ethanolic extract:

Soxhlate apparatus

Take organic solvent as ethanol 50ml in Soxhlet RBF and small amount of dry sample in a thimble, which is placed in a distillation flask containing the solvent of particular interest. After reaching an overflow level, the solution of the thimble-holder is aspirated by a siphon, which unloads the solution back into the distillation flask.



Image no.1: Soxhlet extraction method

Alkaloids obtained from the *Jatropha curcas* latex by the Soxhlet method

Yellow organic solvent contains alkaloid solution obtained

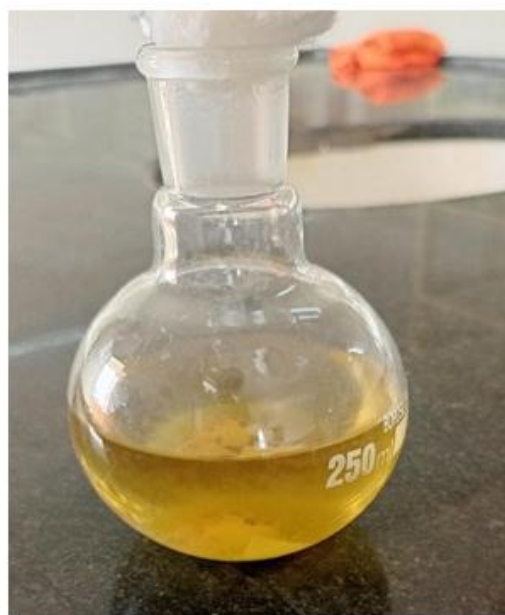


Image no 2 : extraction for alkaloids

Identification Test for alkaloids :

- 1) **Mayer's reagent test:** it is the solution of potassium mercuric iodide prepared by dissolving mercuric chloride (1.36 g) and potassium iodide (3.g) in water to make 100 ml . it gives cream or greyish white colour precipitates with alkaloids. Take 1ml solution of alkaloids add to the Mayer's reagent in test tube cream or greyish colour precipitates are obtained .
- 2) **Hangerson's reagent :** it is a saturated solution of picric acid in water and give yellow precipitates with alkaloids.
- 3) **Dragendorff's reagent :** it is solution of potassium bismuth iodide . it is prepared by dissolving bismuth nitrate (8g) in nitric acid (20ml) and separately potassium iodide (27.2g) in water (50ml), mixing the two solution and making up the volume to 100ml . the reagent gives reddish brown precipitates with alkaloids .

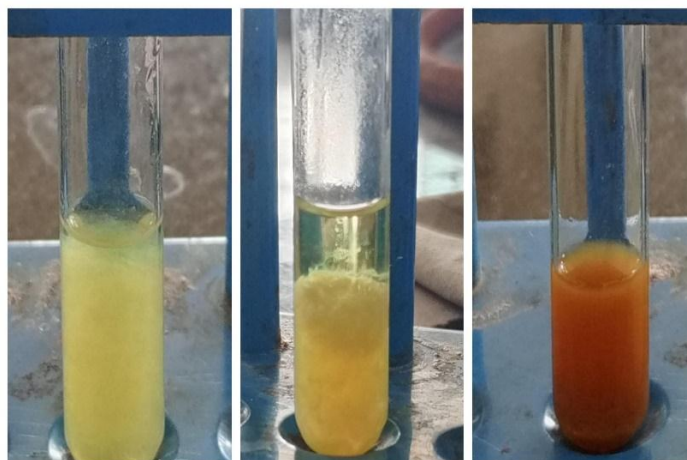


Image no.3 : identification tests for alkaloids

Method of mouthwash preparation:

Three phase prepared

A) Phase 1 : Active ingredient

- 1) 1ml of fresh latex dissolve in 1ml ethanol in batch 1.
- 2) 1.5ml of fresh latex dissolve in 1ml ethanol in batch 2.
- 3) 2ml of fresh latex dissolving in 1 ml ethanol in batch 3.

B) Phase 2 :

Take 1.5ml tween20 then add few drops of mentha oil and glycerine in each batch.

C) Phase 3:

Prepare solution of turmeric powder (0.40g) and fine clove powder (0.60g) dissolve in 10 ml distilled water .

Mix both phases 2&3 in beaker and then add phase 1 on it . then transfer this solution into 100ml volumetric flask then make up the volume up to 100ml with the help of distilled water, and the product packaged in an attractive , transparent glass bottle container of each an every batch.

Table no. 2:Formulation of mouthwash.

Sr.no	Ingredients	Formulation Batch 1	Batch 2	Batch 3	Uses
1	J. Curcas latex	1ml	1.5ml	2ml	Active drug
2	Ethanol	1ml	1ml	1ml	Solubilizing agent
3	Tween20	0.5ml	1ml	1.5ml	surfactant
4	Mentha oil	0.3ml	0.2ml	0.1ml	flavour
5	Glycerine	0.1ml	0.1ml	0.1ml	Humectant
6	Turmeric powder	0.40 g	0.40g	0.40g	Antibacterial and preservative
7	Clove powder	0.60 g	0.60g	0.60g	Flavouring and antibacterial agent
8	Distilled water	Q.S	Q.S	Q.S	Q.S

EVALUATION TEST

1)Physical evaluation test(by visualization)

Table no. 3: Physical Evaluation

Sr .no	Parameter	observation
1	Colour	Yellow



2	Odour	Aromatic
3	Test	Pleasant
4	Consistency	Medium

2) PH test

A digital pH meter was used to measure the pH of prepared mouthwash formulations.

For the evaluation pH the electrode of the pH meter was immersed into the mouthwash formulation and kept it in the formulation until the displayed level was stable. Note down the reading from display



Image no.4: pH meter test

3) Physical stability: The visual appearance, homogeneity and physical separation of the formulated mouthwash were measured throughout this test. Three formulations of mouthwash were then kept at different temperatures, including 12°C and 25°C. The appearance was then assessed at various temperatures, and the findings were recorded.

4) pH stability: A calibrated pH meter was used to record pH stability. To evaluate the changes in the pH readings, different mouthwash formulations were kept on the shelf of a room at 37°C and at 40°C. After that, the result was noted and compared for a period of six week

III. RESULTS :

The alkaloid extract was obtained from *J. curacas* latex by the Soxhlet extraction method. A yellow colour solution was obtained containing alkaloids such as jatrophine, jatrophen, jatrophone, and curcain which are anticarcinogenic and traditionally also wound healing or antibacterial agents.

Preparation of herbal mouthwash formulations:

Three formulations of herbal mouthwash formulation:

Batch-1, Batch-2 and Batch-3 formulation were prepared.

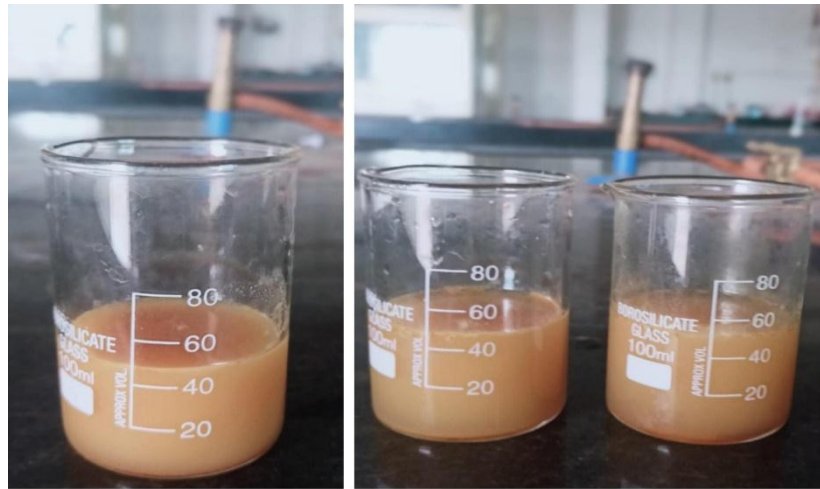


Image no .5: Herbal mouthwash formulation

Evaluation parameter:

Three formulation prepared Batch-1,2 and 3of herbal mouthwash and their physical evaluation parameter are follows:

Table no.4: Evaluation parameter

Sr.no	Formulation	Parameter	Observation
1	B-1	Colour Odour Appearance Texture	Pale yellow Pleasant Visual appearance liquid
2	B-2	Colour Odour Appearance Texture	Orange Pleasant Visual appearance liquid
3	B-3	Colour Odour Appearance Texture	Yellow Pleasant Visual appearance liquid

STABILITY STUDIES:

The result of physical stability studies was shown in below table:

Change in colour, odour, physical separation of all three formulated mouthwash was observed at 12°C and 37°C.

Table no. 5: Physical stability of herbal mouthwash formulations.

Formulation batches	Parameter	Temperature (12°C)	Temperature (37°C)
B-1	Change in colour, odour, Physical separation	No change	Phase separation
B-2	Change in colour, Odour, Physical separation	No change	Phase separation
B-3	Change in colour, Odour, Physical separation	No change	No change



IV. CONCLUSION:

This study revealed that prepared mouthwash is safe and significantly effective in maintaining oral health, and it could be used as an adjunct to mechanical oral hygiene measures. Latex from *Jatropha curcas* has been used traditionally in the medical region it used to cure many illness related to tooth and antimicrobial activity. also mouth sores or mouth ulcer. They also help in removing or destroying bacteria, relieving infection of oral tissues, preventing dental caries, masking bad breath, etc

The objective of this research is to formulate non toxic herbal mouthwash lotion from *Jatropha curcas* latex in the medical region it have ability to cure several types of mouthsores. The latex will act as active ingredients in the present mouthwash formulation with needed chemicals for the formulation. To check the stability test will be done. the expected results from this formulation are the mouthwash is stabilising in room temperature and normal atmospheric pressure.

The presence of phytochemical like flavonoids, phenolic compounds, tannins, alkaloids and terpenoids. The alkaloids as a secondary metabolites present in the latex that give main action of (curcain) shows antibacterial activity. As the conclusion *Jatropha curcas* latex has very high potential in order to improve the formulation activity on the mouth ulcer

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