WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 8.084
Volume 13, Issue 1, 886-899. Research Article ISSN 2277–7105

GUAVA USED TO TREAT MOUTH ULCER

Vaibhavi Shirke*, Rajashri R. Dhonnar, Shweta S. Shelar, Deep M. Solanki and Rutuja S. Shinde

Shivaji Rao S. Jondhle College of Pharmacy, ASANGAON THANE.

Article Received on
24 October 2023,

Revised on 14 Nov. 2023,
Accepted on 04 Dec. 2023

DOI: 10.20959/wjpr20231-30469

***Corresponding Author**
Vaibhavi Shirke
Shivaji Rao S. Jondhle
College of Pharmacy,
ASANGAON THANE.

ABSTRACT

The objectives of present investigation were to formulate and evaluate herbal gel for mouth ulcer treatment of Dried powdered guava leaves. Herbal gel was prepared by using different concentration of powdered guava leaves and Carbopol 934, Propylene glycol as a gel base. Formulations were evaluated for various parameters Infrared spectroscopy revealed that there was no interaction between powdered Guava leaves and Polymer. The formulated gel was transparent, homogeneous and pH ranges from 7 to 7.5. Formulation showed Acceptable rheological behaviour with applicable Spreadability and Extrudability properties. Anti-fungal studies Of formulations showed excellent efficacy against Aspargilious aureus, Candida albicans. From the experimental evidence of invitro studies it was observed that powdered guava leaves contain Flavonoids so it showed significant antioxidant effect. Developed herbal formulation was stable, safe and effective over to synthetic formulations for the treatment of Mouth ulcer.

INTRODUCTION

Guava is known for its medicinal properties. It is rich in antioxidants, vitamin C, fiber and many other nutrients. The leaves are used in traditional medicine to treat diarrhoea, diabetes and respiratory problems. Guava's antibacterial properties may also aid oral health. However, a doctor should be consulted before using it for therapeuticpurposes.

Turmeric is a common ingredient used in almost every Indian dish.

Scientific name:- Curcuma Longa Family:- Zingiberaceae, Chemical Constituents:- Diarylheptanoids, Curcumin, dimeth-Oxy curcumin, and Bisdemethoxycur-Cumin.

Uses:- Anti-inflammatory, Antiulcer and anti-Arthritic activity.[2]
Aloe vera can reduce pain caused by canker sores and speed up thehealing process. Scientific name:- Aloe bar-Badensis Miller. Family:- Liliaceae. Chemical constituents:- Amino acids, anthraquinones, enzymes, minerals, Vitamins, lignins, Monosaccharides, Polysaccharides, Salicylic acid, saponins, and sterols are Among the many Substances found in Plants. Uses:- Properties that are Anti- inflammatory, Anti-oxidant, anti-Cancer, healing, Anti-ulcer, and Anti-diabetic.[3]

In Ayurveda, palm tree or mehendi leaves and amla leaves can be boiled along with alum to make a puree. Frequent gargling with soupmay help relieve pain.

Preface Guava, scientifically known as Psidium guajava, has been traditionally used for its medicinal parcels, especially in treating colourful oral health issues. In the environment of a drugstore designfastening on its use for mouth ulcers, you might want to include information on its active factors, similar as tannins, flavonoids, and essential canvases, which contribute to its anti-inflammatory and antimicrobial parcels. Likewise, it would be essential to cave into its medium of action, potentially pressing how guava's factors help in reducing inflammation, promoting mending, and combating microbial growth, thereby abetting in the treatment of mouth ulcers. Also, you could unfold on the colourful phrasings and delivery styles through which guava can be administered for the treatment of mouth ulcers, including mouthwashes, gels, and tablets. Agitating the lozenge recommendations, possible contraindications, and any implicit sidegoods would also be pivotal in furnishing a comprehensive understanding of its remedial use. Also, it's important to incorporate any recent exploration studies or clinical trials that support the efficacy of guava in treating mouth ulcers, therefore furnishing credibility and applicability to your design. Incipiently, you can outline unborn prospects or implicit areas of farther exploration to encourage disquisition and development in this field.

A mucus membrane ulcer is an open sore that is distinguished by theremoval of Inflammatory dead tissue. Although they can occur everywhere, ulcers are frequently Found on the skin of the lower extremities and in the digestive system. There are Numerous different types of ulcers, including vaginal, oesophageal, and mouth ulcers. Theyare painful round or oval sores that typically develop on the inside of the cheeks or Lips and the buccal cavity. Currently available topical delivery for the treatment of mouth ulcer is gel or cream Base, and necessary to apply with figure which is painful and, many times, notpossible To access the ulcer easily. The goal is to formulate liquid formulation, therefore, it can Directly delivered through

container andspread easily on affected part where than Liquid film is converted intosemisolid. This semisolid layer remains on ulcer for longer Period of time as compared to liquid film, hence will improve the therapy in terms of Longer duration of action. Additionally, in contrast to the semisolid dosage forms, spreading of formulation is Spontaneous andhence not required force to apply on ulcer which ultimately improvesthe patient compliance.

Types of mouth ulcer

On the basis of ulcer size and number, mouth ulcer can be Classified as minor, major and Herpetiform ulcers. The main types of mouth ulcer are:

- **Minor ulcers:** Minor aphthous ulcers are the foremost Common form considering for about 80% of cases. These Are around 2-8mm in diameter which they typically clear Up in 10 days to 2 weeks. Typically, these ulcers are Superficial in nature, small in size, usually but 1 cm in Diameter, few in number, occurring singularly or in Groups, and heal without scarring.[22]

- **Major ulcers:** The second type is major aphthous ulcers, It occurs in about 10% of patients. These are bigger and Deeper in shape often over1cm in diameter, with a raised Or irregular border.[23] And they occur either singly or as Multiple lesions. This type of ulcer can take several Weeks to heal and can leave a scar within the Mouth because of the extent of necrosis.[24]

- **Herpetiform ulcers:** These are a collection of tiny ulcers, each no largerthan a pinhead.

Very small ulcers, measuring 2-3 mm in diameter, can occur in huge, irregular lesions that Can fuse together in numbers of 100 or more at once and remain for 7–10 days without Leaving scars.[6-8]

Causes

There is no definite etiology and pathology known for mouth Ulcer; although some factors are considered important which Include nutritional deficiencies such as iron, vitamins Especially B12 and C, poor oral hygiene, infections, stress, Indigestion, mechanical injury, skin disease etc.[25] Some other Factor include such as:

- **Genetic factors:** There is a genetic component in patients With aphthous ulcers, with about 30%-40% of patients Having a family history.[26] A family history of recurrent Aphthous ulcers is obvious in some patients. A familiar Connection includes a young age of onset and symptoms of increased severity. Recurrent aphthous ulcers are Highly correlated in identical twins.[27]

- **Physical or psychological stress:** There is a strong Connection of aphthous ulcer occurrences with stressful Life.[28] Psychological stress may play a role in the Appearance of recurrent aphthous stomatitis as a trigger Or a modifying factor. No studies have convincingly Proved stress as a causative or precipitating factor for Recurrent apthous stomatitis.[29]

- **Nutritional deficiency:** Various nutritional deficiencies Have been implicated in a subset of aphthous ulcer patients, which involving ofiron, folic acid, vitamin B12, B1,B2 and B6. The contribution of nutritional Deficiencies to aphthous ulcers are likely to vary across Different regions based on diet and food supplementation.[30]

- **Trauma:** The most likely factors which bring about Aphthous ulcers arelocal trauma and stress. Injury to the Oral mucosa may give result from accidental self-biting, Dental

procedures, tooth brush bristles, and sharp-edged Foods (e.g., potato chips), anesthetic injection. Apart from This environmental and emotional stress also result into Aphthous ulcer.[31]

- **Food allergies:** There are various food which is able To cause allergies.

Antibodies to cow's milk and wheat Protein (celiac disease) are demonstrated in patients with Recurrent apthous stomatitis. Therefore, many foods that Are commonly allergenic (e.g., strawberries, tomatoes, and nuts) haven't been causally associated with recurrent Apthous stomatitis.[32] Foods like chocolate, coffee, Peanuts, cereals, almonds, strawberries, cheese, tomatoes (Even the skin of the tomatoes) and flour (containing Gluten) could even be implicated in some patients.[33]

Herbal remedies for mouth ulcer[1]

As from the ancient era photogenic agents are used by for the Prevention and treatment of mouth ulcer. Some of the botanical compounds with anti-ulcer activity include flavonoids (i.e. Quercetin, naringin, silymarin, anthocyanosides, sophoradin Derivatives) saponins (i.e. from Panaxjaponicus and Kochia Scoparia), tannins (i.e. from Lin deraeumbellatae), gums and Mucilage (i.e. gum guar and myrrh).

Among herbal drugs, liquorice, aloe gel and capsicum (chilli) can be used extensively Having major effect in treatment of mouth ulcer. Ethnomedical systems employ several plant extracts for the treatment of Ulcer.

Some of the Herbs that can be used as anti-ulcer Drugs:[35,36]

1. Harra (Terminalia chebula)[4] chewed after dinner cures Mouthulcers.
2. Basil leaves (Ocimum sanctum)[5] and Tomato juice (Lycopersicum esculentum) are taken for mouth ulcers.
3. Powder of nirgund (Vitex negundo) and Musli (Chlorophytum borivilicum) is prepared and can be taken four times A day formouth ulcers.
4. Mulberry (Morus Alba) juice is given to infants for this Ailment.
5. Akarkara (Spilanthes calva) flower is chewed in mouth Ulcers. It gives strength to the teeth.
6. Ash of burnt fruit bark of the water melon is also given Solanum and ginger oil are also used for mouth ulcer.

Guava

The origin of guava is Psidium Guajava.It belongs to the Myrtaceae family.

Shape: Guava fruit is usually 4 to 12 centimetres' (1.6 to 4.7 inches) longand round or oval in shape, depending on the species. They have a distinct and accurate aroma similar to lemon peel, but less pungent.

The skin can be hard, often bitter, or soft and sweet. The skin can be ofvarying thickness and is usually green before it grows, but can turn yellow, maroon or green when it matures. The pulp inside can be sweetor sour, off-white ("white" guava) to dark red ("red" guava). The number and hardness of seeds in the middle pulp varies from variety tovariety.

Plant part used: Leaves, Roots, Fruits.

Chemical composition: Guava leaves contain carotenoids and polyphenols such as (+)-gallocatechin and leucoanthocyanins. Red- orange guavas contain more polyphenols and carotenoids than yellowish-green guavas, as some of these phytochemicals areresponsible for skin color and texture.

Use: Due to its high pectin content, guava is widely used to make desserts, preserves, jellies, jams and marmalades (such as Brazilian goiabada and Colombian and Venezuelan bocadillo) and as a bright jam.Red guava can be used as a base in the preparation of savories such as sauce, especially in place of tomatoes to reduce acidity. The drink can be made from the leaves and juice of guava leaves, which is called "tea"and is considered medicine.

Guava (Psidium guajava): For the herbal treatment of a number of oral conditions, Including toothaches, sore throats, inflamed gums, and ulcers, Psidium guajava has been Utilised. Guava leaf decoction has also been administered as mouthwash.[19] In two separate Investigations, Shaikh et al. and Thombre et al. created and assessed an aqueous gel of Powdered guava leaves for the treatment of oral ulcers. They found thatthe powdered guava Leaves contained flavonoids and had a sizable antioxidant effect. When compared to synthetic Formulations for the treatment of oral ulcers, the herbal formulation proved to be stable, safe, And efficacious.[19,20] In another study researcher found that using mouthwash made from Guava leaves helped aphthous ulcers heal more quickly and with less discomfort.[21]

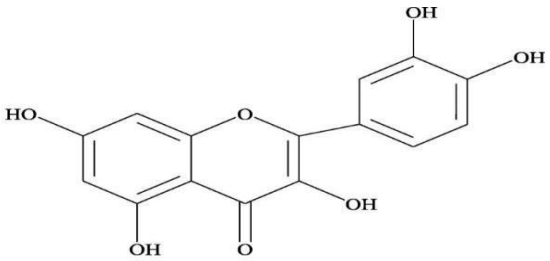
Constituents

Flavonoids are phytochemicals found in many plants, fruits, vegetablesand leaves and can be used in medicinal chemistry. Flavonoids have many medicinal properties, including antibacterial, antifungal, antiviraland antibacterial properties. They also have neuroprotective and cardioprotective effects. These activities depend on the type of flavonoid, its (possible) mode of action and bioavailability. These cost- effective medicinal ingredients have important biological functions and their anti-inflammatory effects have been demonstrated. Recent studieshave focused on their isolation, synthesis of analogues using various techniques and animal models, and their effects on human health. Thousands of flavonoids have been successfully isolated, and this number is constantly increasing. Therefore, we tried to summarize isolated flavonoids with important functions to better understand their effects on human health.

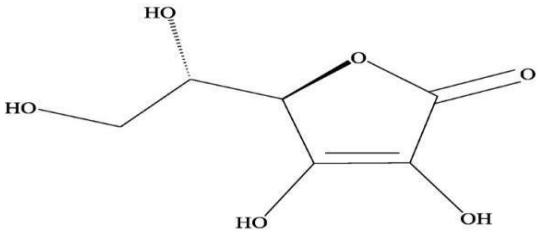
Flavonoids are abundant and widespread throughout the plant kingdom. They work as plant pigments and are responsible for the color of many flowers and fruits. Flavonoids are abundant in plants and foundin human foods, especially foods rich in fruits and vegetables. The word "flavonoid" comes from the Latin word flavus, meaning yellow, and many flavonoids are yellow in color. However, many other anthocyanins are white, while specific anthocyanins related to flavonoids are red, blue, or purple. (See the blueberry monograph for a discussion of the pharmacological properties of anthocyanins.) Flavonoids are also foundin the leaves and are said to protect tissue from damage caused by ultraviolet radiation.

Flavonoids have a benzene ring attached to the benzo-gamma-pyronestructure. They are made from three parts acetate and one part phenylpropane (via the shikimate pathway). More than

2000 species are known; About 500 of these exist in the free form (aglycones) and the remainder are O- or C-glycosides. Flavonoid glycosides are mostly water soluble. There are three main types of carbon 3 based on its oxidation state. These are flavones, flavonols and flavonones. The properties of isoflavonoids are discussed in the Phytoestrogens section.



(a)



(b)

Flavonoids and their derivatives can be isolated from guava. These compounds inhibit the growth of different bacteria at different dilutions. Terpinene and pinene are found in aqueous extracts of theleaves and have antimicrobial activity.

MATERIAL AND METHODS

The fresh plant materials of Psidium guajava were Collected from local area. Fresh plant leaves Were washed under running distilled water as well as Tap water and shade drying was carried out. The Collected plant was authenticated at Department of industrial pharmacy, Shivajirao jondhale college of pharmacy asangaon. All other ingredients of analytical grade Purchased from Loba Chemicals Mumbai.

Preparation of herbal Gel:

Specified amount of Carbopol 934 was dispersed in Required amount of distilled water with continuous Stirring. 5 ml of distilled water was takenand Required quantity of methyl paraben and propyl Paraben were dissolved by heating on water bath After cooling propylene glycol was added. Further Varying concentration of Psidium guajava powder Was mixed to the above mixture and volume was Made up to 20 ml with distilled water. Finally full Mixed

ingredients were mixed properly to the Carbopol 934 gel with continuous stirring and Triethanolamine was added drop wise to the Formulation for adjustment of required pH (6.8-7(Das, 2010).[9],[10]

The composition of herbal gel prepared from the Powdered guavaleaves coded as G1, G2, and G3 is Tabulated in Table 1.

Table 1: Composition of various gel formulations Containing powderedguava leaves.

Ingredients	G1	G2	G3
Guava leaves powder	2%	1%	0.5%
Carbopol 934	2%	2%	2%
Methyl paraben	0.0015%	0.0015%	0.0015%
Propyl paraben	0.01%	0.01%	0.01%
Triethanolamine	q.s + pH 6.5-7	q.s + pH 6.5-7	q.s + pH 6.5-7
Distilled water	Up to 20 ml	Up to 20 ml	Up to 20 ml

Evaluation of herbal gel

- **Physical appearance:** Physical parameters such as appearance andcolour Were checked.
- **Measurement of pH:** The pH of herbal gel formulations were determined By using digital pH meter. 1 gm of gel was taken and Dispersed in 10 ml of distilled water and keep aside For two hours. The measurement of pH of Formulation was carried out in three times and the Average values are reported (Sanghavi, 1989). pH of Gel formulation was reported in table no 2.
- **Homogeneity:** All developed gel formulations were tested for Homogeneity by visual inspection after the gels have been set in to the container. They were tested for their presence and appearance of any aggregates (Gupta, 2010). Homogeneity of gel formulation was Reported in table no 2.
- **Spreadability:** Spreadability was determined by glass slide and Wooden block apparatus. Weights about 20 gm were Added to the pan and the time were noted for upper Slide to move to separate completely from the fixed Slide (Shivhare, 2009). An excess amount of gel 2 gm Under study was placed on this ground slide. The gel Was then sandwiched between this slide and another Glass slide having the fixed ground slide and there is Provided with the hook. A 1 kg weighted was placed On the top of the slides for 5 minutes to provide a Uniform film of the gel and remove air between the Slides. Excess of the gel was removed off from the Edges. The top plate was then subjected to pullwith The

help of string attached to the hook and the time In seconds required by the top slide to cover a Distance of 7.5 cm be noted. A shorter or less Interval indicates better Spreadability. Spreadability Of gel was calculated using the following formula (Pawar, 2013).

Spreadability of gel was reported in Table no 2.S = M × L / T

Where, S = Spreadability,

M = Weight in the pan which is tied to the upper slideL = Length moved by the glass slide

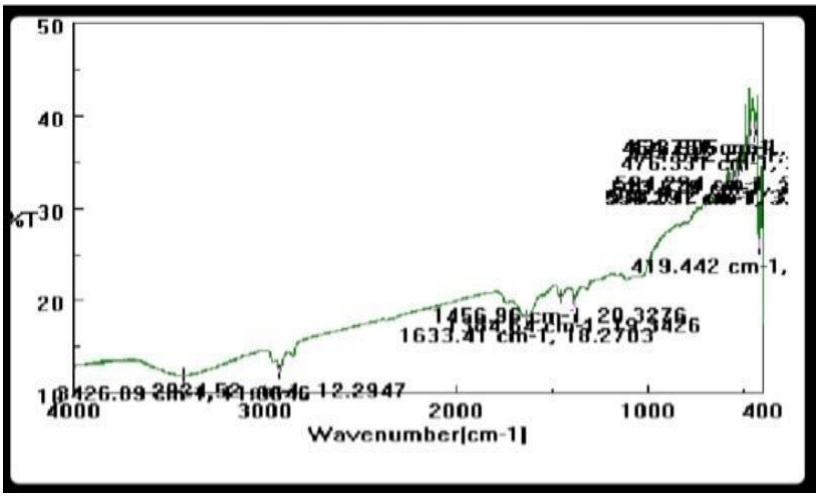
T = Time in second taken to separate the slide Completely each other.

- **Viscosity:** Viscosity was determined by using Brookfield Viscometer (DV-III programmable Rheometer). Formulated gels were tested for their rheological Behaviours at 250C. The measurement was made over Range of speed from 10rpm to 100rpm with 30seconds between 2 successive speeds and then in A reverse orders (Bhramaramba, 2015).
- **Extrudability:** The gel formulations were filled in standard capped Collapsible aluminium tubes and sealed to the end. The extrudability was determined by pressing of the Thumb.
- **Clarity:** The clarity of all the three batches was determined By visual inspection (Pandey, 2011).

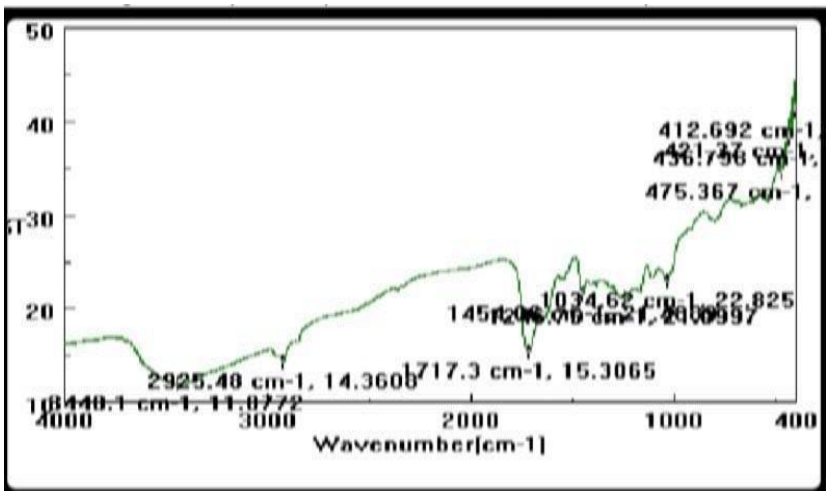
Formulation	Physical Appearance	pH	Homogeneity	Spreadability	Visc
G1 (2%)	Greenish	6.8-0.9	Good	5.30-0.1	3.110.00
G2 (1%)	Greenish	7-0.9	Good	5.76-0.15	3.020.04
G3 (0.5%)	Greenish	6.9-0.5	Good	6.23-0.057	2.290.01

RESULT AND DISCUSSION

IR spectra of powder guava leaves



IR spectra of powder guava Leaves and Carbopol 934



CONCLUSION

The data presented in this study, it was demonstrated that the developed herbal gel formulation possess Significant, therapeutically efficacious, suitable vehicle for drug delivery in low cost but definitely with high Potential. Developed new herbal gel formulation is suitablefor mouth ulcer treatment.

REFERENCE

1. Anjali Teresa, Krishnakumar K, Dinesh Kumar B, Anish John. J.Bio.Innov, 2017; 6(4): pp 521-527.
2. Sing R, Bansal S, Kumar Mishra M. Formulation and evaluation of herbal oral gel containing extracts of powdered Psidium guajava linn Leaves with Curcuma longa linn rhizomes to Treat mouth ulcer. International Journal of Drug Development and Research, 2020; 12(2): 1-7.
3. Langmead L, Feakins RM, Goldthorpe S, Holt H, Tsironi E, De Silva A, Jewell DP, Rampton DS. Randomized, double blind, placebo controlled trial of oral aloe vera gel for active ulcerative colitis. Alimentary pharmacology & Therapeutics, 2004 Apr; 19(7): 739-47.
4. Praveen Sharma, et al, Antiulcerogenic activity of Terminalia Chebula fruit in experimental induced ulcer in rats, Journal ofPharmaceutical biology, 2011; 49(3).
5. Sai Krishna G. "Tulsi-the wonder Herb (Pharmacological Activitiesof Ocimum sanctum), American Journal of Ethnomedicine, 2014; 1(1): 089-095.
6. Munoz-Corcuera M, Esparza-Gomez G, Gonzalez-Moles MA, Bascones Martinez A. Oral ulcers: clinical aspects. A tool for dermatologists, Part I, Acute ulcers. Clin Exp Dermatol,

2009; 34: 289-294.

7. Tarakji B, Gazal G, Al-Maweri SA, Azzeghaiby SN, Alaizari N. Guideline for the Diagnosis and treatment of recurrent aphthousstomatitis for dental practitioners. J Int Oral Health, 2015; 7: 74-78.
8. Swain N, Pathak J, Poonja LS, Penkar Y. Etiological factors of recurrent aphthous Stomatitis: A common perplexity. J Contempdent, 2012; 2: 96-100.
9. Thete M, Shimpi P. Review on Role of Herbs in Management of Oral diseases. Asian Journal of Pharmaceutical Research, 2020; 1: 10(4).
10. Shaikh S, Shete A, Doijad R. Formulation and Evaluation pharmaceutical aqueous gel of Powdered guava leaves for mouthulcer treatment. PharmaTutor, 2018; 1, 6(4): 32-38.
11. Das S. et al, Formulation and Evaluation of Herbal Gel Containing Clerodendronin fortunatum Leaves Extract, International Journal of PharmTech Research, 2011; 1(3): 140-143.
12. Sanghavi, Study on Topical Piroxicam Formulations, IndianDrugs, 1989; 26(4): 165-168.
13. Gupta, Formulation and Evaluation of Topical Gel of Diclofenac Sodium Using Different Polymers, Drug InventionToday, 2010; 2(5): 250-253.
14. Shivhare, Formulation Development and Evaluation of Diclofenac Sodium Gel Using Water Soluble Polyacrylamide Polymer, Digest journal of Nanomaterial's and Biostructures, 2009; 4(2): 285-290.
15. Pawar DP, Formulation And Evaluation of Herbal Gel Containing Lantana Camara Leaves Extract, Asian Journal of Pharmaceuticals & Clinical Research, 2013; 6(3): 122-124.
16. Bhramaramba, Formulation and Evaluation of Herbal Gel Containing Terminalia chebula Retz Leaves Extract, Scholars Academic Journal of Pharmacy, 2015; 4(3): 172-176.
17. Pandey, Formulation And Evaluation of Invitro Antimicrobial Activity of Gel Containing Essential Oils And Effect of Polymer on Their Antimicrobial Activity, International Journal of Pharmacy And Pharmaceutical Sciences,2011; 3(1): 234-237.
18. Jaiarj P, Khoohaswan P, Wongkrajang Y, et al. Anti cough and Antimicrobial activities of Psidium guajava Linn. Leaf extract. J Ethnopharmacol, 1999; 67(2): 203–212.
19. Shaikh R, Raj Singh TR, Garland MJ, Woolfson AD, Donnelly RF. Mucoadhesive drug delivery systems. J Pharm Bioallied Sci, 2011; 3(1): 89–100.
20. Guintu FZ, Chua AH. Effectivity of guava leaves (Psidium guajava) as mouthwash for patients with aphthous ulcers. Philipp JOtolaryngol Head Neck Surg, 2013; 28(2): 8–13.
21. Woo SB, Sonis ST. Recurrent aphthous ulcers: a review of diagnosis and treatment. J Am

Dent Assoc, 1996; 127: 1202-13.

22. Heidar Khademi, Pedram Iranmanesh, Alimoeini, Atefeh Tavangar. Evaluation of the Effectiveness of the Iralvex Gel on the Recurrent Aphthous Stomatitis Management. International Scholarly Research Notices, 2014; 1-5.
23. Sumitra Singh, Bhagwati Devi Rohilla. Formulation and Evaluation of herbal gel from different parts of Cyamposis Tetragonoloba (L) TAUB. For wound Healing. World Journal ofPharmacy and Pharmaceutical Sciences, 2015; 5(3): 740-752.
24. Redman RS. Recurrent oral ulcers. Northwest Dent, 1972; 51: 232-4.
25. Rezvaninejad R, Navabi N, Khoshroo MR, Torabi N, Atai Z. Herbal Medicine in Treatment of Recurrent Aphthous Stomatitis. Journal of Islamic Dental Association of IRAN, 2017; 29(3): 127-134.
26. Redman RS. Recurrent oral ulcers. Northwest Dent, 1972; 51: 232-4.
27. Abolfazl Aslani, Behzad Zolfaghari, Fatemeh Davoodvandi. Design, Formulation and Evaluation of an Oral gel from Punica Granatum Flower extract for the Treatment of Recurrent AphthousStomatitis. Advanced Pharmaceutical Bulletin, 2016; 6(3): 391-398.
28. Ambikar RB, Phadtare GA, Powar PV, Sharma PH. Formulation and Evaluation of the Herbal oral Dissolving Film for treatment of Recurrent Aphthous Stomatitis. International Journalof Phytotherapy Research, 2014; 4(1): 11-18.
29. Niyaz Basha B, Kalyani Prakasam, Divakar Goli. Formulation and evaluation of Gel containing Fluconazole- Antifungal Agent. International Journal of Drug Development & Research, 2011; 3(4): 109-12.
30. Mohsin J Jamadar, Rajmahammad Husen Shaikh. Preparationand evaluation of herbal gel formulation. Journal of Pharmaceutical Research and Education, 2017; 1(2): 201-224.
31. Abdullah MJ. Prevalence of recurrent aphthous ulcerationExperience in patients attending Piramird dental Speciality in Sulaimani City. J Clin Exp Dent, 2013; 5: e89e94.
32. Miller MF, Garfunkel AA, Ram C, Ship II. Inheritance Patterns in recurrent aphthous ulcers: twin and pedigree Data. Oral Surg Med Oral Pathol, 1977; 43(6): 886-91.
33. Allen L. Compounding Gels, Current & Practical Compounding Information For The Pharmacist, Paddoc Laboratories'. Jerry Kennard, what to do about Ulcers in the Mouth, 2018; 4(5).
34. Deepak Acharya. Medicinal plants for curing commonAilments In India, listed in herbal medicine, 2004; 102.
35. Jerry Kennard, what to do about Ulcers in the Mouth, 2018.
36. Deepak Acharya. Medicinal plants for curing common Ailments In India, listed in herbal

medicine, 2004; 102.