

FORMULATION AND EVALUATION OF HERBAL LOZENGES FOR SORE THROAT INFECTION

Gajendra Ratre, Sandip Prasad Tiwari*, Khushboo Gupta

Faculty of Pharmacy, Kalinga University, Naya Raipur, Chhattisgarh India (492101)

Corresponding author email: sandip.tiwari@kalingauniversity.ac.in

Abstract - Herbal lozenges were used in both Traditional Chinese Medicine and Ayurveda. During this time, sugar started to supplant honey as the main ingredient in lozenges and its use grew increasingly popular. In order to make throat soothers, apothecaries would combine sugar with therapeutic plants. These early lozenges were frequently used to cure a variety of illnesses, from digestive problems to sore throats. Using jaggery as the foundation, a mixture of glauva extract and *Glycyrrhiza Glabra* was used to make the lozenges. The monograph analysis was carried out in compliance with according to WHO recommendations. It was discovered that the formulation was absorbing moisture from the air during storage, indicating that when the formulation needs to be preserved for later usage, appropriate packing and storage conditions are necessary. The ash value test, swelling index, moisture content, alcohol and water extractives, thin layer chromatography, and ultraviolet analysis were the quality control parameters.

Keywords – chromatography, swelling index, lozenges, Ayurveda

Introduction

Herbal lozenges are made from a concoction of therapeutic herbs that are renowned for their calming and restorative qualities. Herbal lozenges make use of organic substances like honey, echinacea, licorice root, and slippery elm, as opposed to synthetic lozenges, which frequently contain chemicals and artificial compounds. Every one of these components has special 5 advantages echinacea boosts immunity, honey has a natural antibacterial and calming effect, licorice root coats and protects the throat, and slippery elm has anti-inflammatory qualities to lessen inflammation. Herbal lozenges are successful because they can utilise the medicinal properties of these plants to provide a safe and efficient form of comfort. They are therefore a desirable choice for people looking for a natural approach to healthcare. Lozenges are also easy to use due to their convenient form and delicious taste, especially for people who don't like to take traditional medications. We will examine the particular herbs that are frequently used, their therapeutic uses, and the science underlying their calming effects in this discussion on using herbal lozenges to heal sore throats. You may choose wisely when adding these natural treatments to your health regimen if you are aware of the uses and advantages of herbal lozenges. Herbal lozenges provide a dependable, all-natural remedy that draws from centuries of traditional medicine and recent research, whether treating a minor throat irritation or a more serious problem. A sore throat can cause a variety of symptoms, but frequently includes red or enlarged tonsils, hoarseness,

swollen glands, and difficulty swallowing. Fever, headaches, and bodily aches can occasionally be felt as well, suggesting a more widespread infection. Determining the right course of action and guaranteeing a prompt recovery require an understanding of the underlying reason of a sore throat. While therapy can ease discomfort and avoid problems, many sore throat infections heal on their own. The spectrum of options encompasses nonprescription analgesics and lozenges as well as targeted treatments such as antibiotics for bacterial infections. Natural and holistic treatments, such as herbal teas and lozenges, have gained popularity recently since they provide calming and therapeutic effects without the negative side effects of some medications. This overview will examine the many causes, symptoms, and potential treatments for sore throat infections. You may manage this frequent yet painful disease by making informed decisions by knowing the nature of sore throat infections and the best strategies to treat them. The key to preserving comfort and health is finding a way to relieve a sore throat, whether it be through traditional medicine or natural therapies.



Fig no. 01 Images of *Psidium Guajava*

Psidium guajava, the leaf of the guava plant, is highly valued in traditional medicine and has been the focus of several pharmacognostic investigations. The study of pharmaceuticals made from plants and other natural sources is known as pharmacognosy, and it includes the identification, collection, cultivation, and analysis of these materials. Scientific name is *Psidium guajava* belonging to family Myrtaceae & Common names are Guava, Amrood (Hindi), Guyaba (Spanish).

Materials & Methodology

Glycyrrhiza Glabra, Jaggery & *Psidium guajava*, Mentha leaves & *Curcuma Longa Linn* were purchased from local market of Jagdalpur city of Bastar Chhattisgarh.

Put the measured amount of Gauva leaf extract, *Glycyrrhiza glabra*, Mentha leaf extract, *Curcuma Longa Linn*, and tulsi leaves in a container. Heated it until a third of the quantity is obtained. Now poured in the measured amount of jaggery. Once it reaches a thick consistency, stirred in the

necessary amount of honey. Poured this into the moulds in the appropriate forms now, and set aside to cool.

Table no. 01 Composition of Herbal Lozenges

S.No	Ingredients	Quantity
1	Glycyrrhiza glabra	200 mg
2	Jaggery q. s.	10 gm
3	Psidium guajava extract	200mg
4	Pudina leaf extract	5mg
5	Turmeric rhizomes powder	5mg
6	Tulsi leaf extract	50mg

Evaluation

Ash Value determination

The purpose of the total ash method is to quantify the total amount of material left over after ignition. This encompasses both. "Non-physiological" ash is the residue left over when outside materials, such sand and dirt, stick to the surface of the plant, whereas "physiological" ash is made from the plant tissue itself.

Swelling Index determination

The volume in millilitres occupied by the swelling of one gramme of herbal material under particular circumstances is known as the swelling index. It's The addition of water or a swelling agent, as indicated in the test protocol for each unique herbal material, is the basis for the determination.

Moisture content determination

A sample is dried to constant mass at a temperature in order to assess a material's water content. a certain temperature. The formulation's moisture content was ascertained by processing the weighed portion of the formulation in a hot air oven at 120 degrees Celsius until a constant weight was reached. The percentage of moisture content was then computed.

Extractable matter

Using solvents, this approach extracts the amount of active components from a particular amount of plant stuff. It is used for items for which there is currently no appropriate chemical or biological assay. The methodology outlined in the WHO guideline was followed in determining the extraction values.

Thin-layer chromatography

Particularly useful for the qualitative assessment of minute quantities of contaminants. The worldwide pharmacopoeia⁵ provides an explanation of the fundamentals of thin-layer chromatography as well as its use in pharmaceutical analysis. This method is widely used for assessing herbal materials and preparations since it is simple, straightforward to apply, and requires little expensive equipment.

UV-Vis spectrophotometric analysis

UV-Vis spectrophotometric analysis yields standards that are both quantitative and qualitative. However, markers are required in order to perform quantitative analysis. An effort is made to investigate the qualitative and quantitative parameters without markers using UV Vis Spectrometric analysis of several herbal raw materials.

Table no. 02 Macroscopic evaluation of formulated lozenges

S.No	Parameter	Observation
1	Colour	Orangish
2	Odour	Pleasant & Characteristic
3	Taste	Sweet
4	Texture	Smooth
5	Shape	Oval

Table no. 03 Determination of total ash value

S.No.	Drugs	Total ash (% w/w)
1	Glycyrrhiza glabra	1.5
2	Jaggery q. s.	1.9
3	Psidium guajava extract	4.5

4	Pudina leaf extract	1.2
5	Turmeric rhizomes powder	2.0
6	Tulsi leaf extract	2.5

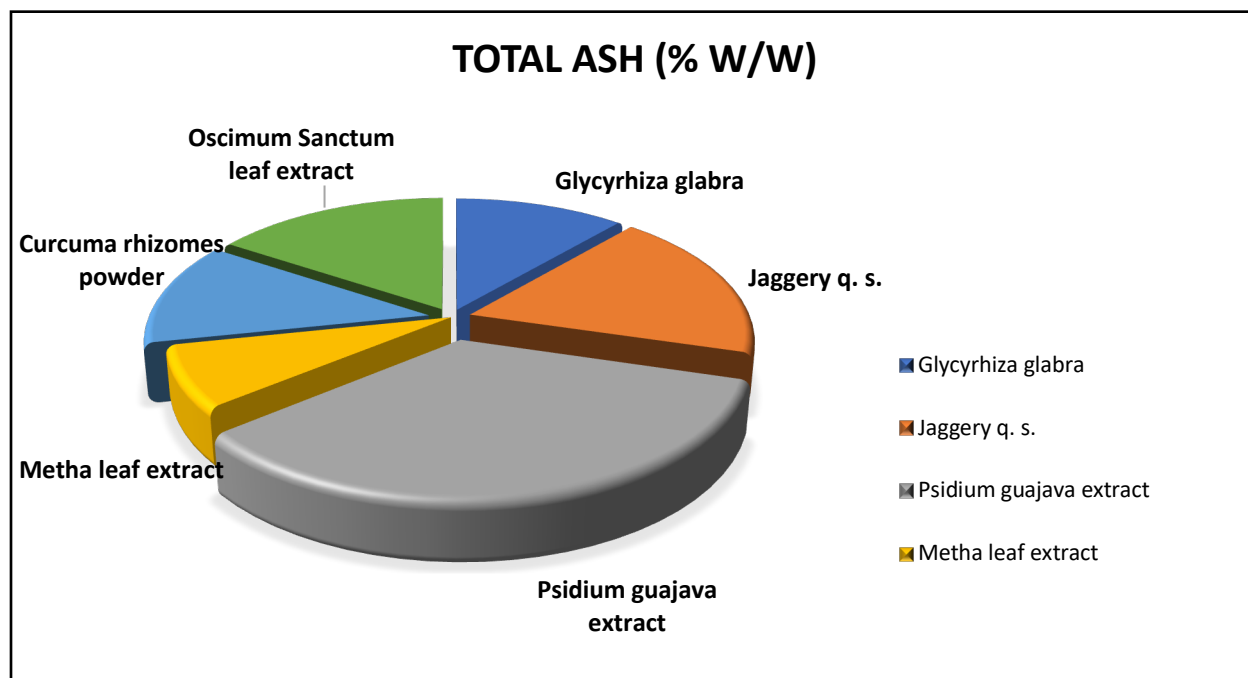


Fig no. 02 Graph of total Ash %

Table no. 04 Determination of swelling index

S.No.	Drugs	Swelling index
1	Glycyrrhiza glabra	Nil
2	Jaggery q. s.	Nil
3	Psidium guajava extract	Nil

4	Pudina leaf extract	Nil
5	Turmeric rhizomes powder	Nil
6	Tulsi leaf extract	Nil

Table no. 05 Determination of moisture content

S.No.	Dosage form	Moisture content
1	Lozenges	4.21

Table no. 06 Determination of extractive values

S.No.	Drugs	Water extractive value	Alcohol extractive value
1	Glycyrrhiza glabra	4.058% w/v	0.911% w/v
2	Jaggery q. s.	3.113% w/v	1.117% w/v
3	Psidium guajava extract	0.114% w/v	-
4	Metha leaf extract	0.11%	-
5	Curcuma rhizomes powder	0.99%	-

6	Oscimum Sanctum leaf extract	2.11%	-
---	---------------------------------	-------	---

Table no. 07 Thin Layer Chromatography

S.No.	TLC	Rf value
1	Pure	0.914
2	Lozenges	0.941

Table no.08 Absorbance data of herbal components of lozenges

Concentration (10µg /ml)	Absorbance
Glycyrhiza glabra	0.08
Jaggery q. s.	0.19
Psidium guajava extract	0.27
Metha leaf extract	0.39
Curcuma rhizomes powder	0.48

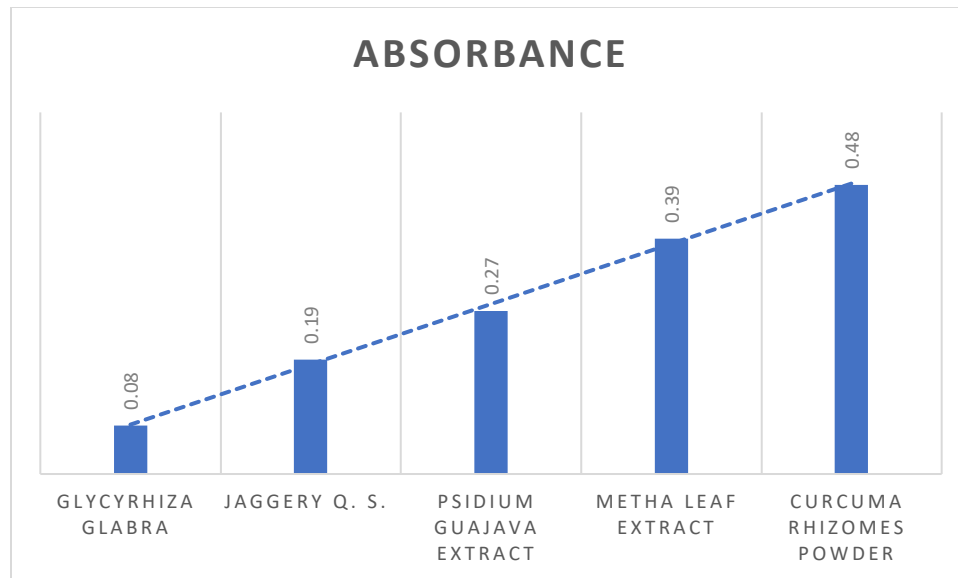


Fig no.03 Graph of Absorbance data of herbal components of lozenges

Using jaggery as the foundation, a mixture of guava extract, Mentha leaves, Turmeric rhizome powder and *glycyrrhiza glabra* was used to make the lozenges. The monograph analysis was carried out in compliance with according to WHO recommendations. The ash value test, swelling index, moisture content, alcohol and water extractives, thin layer chromatography, and ultraviolet analysis were the quality control parameters. According to the aforementioned inquiry, the formulation passed all quality control parameters in the chromatographic analysis piperine and ultraviolet. It was discovered that the formulation was absorbing moisture from the air during storage, indicating that when the formulation needs to be preserved for later usage, appropriate packing and storage conditions are necessary.

Conclusion

Herbal lozenges are made with great care, combining the therapeutic properties of medicinal herbs with useful formulation techniques to create a natural, safe, and effective treatment for respiratory and throat conditions. Herbal lozenges can be a useful supplement to natural health regimes if proper extraction, formulation, moulding, and storage procedures are followed. These lozenges are continuously evaluated to make sure they satisfy the necessary requirements and provide the desired health advantages. Quality control, efficacy testing, safety assessments, and stability studies are some of the methods used to do this.

References

1. Paul M, ESCMID Guideline for the Management of Acute Sore Throat, 2012, 18, ESCMID, 1-18.

2. Maheshwari R, Jain V, Ansari R, Mahajan SC, Joshi G, A review on lozenges, BBB, 2013, 1-9.
3. Shinde SG, Kadam V, Kapse GR, Jadhav SB, Zameeruddin , Bharkad VB, A review on lozenges, IAJPR, 2014, 4, 567- 570.
4. Pothu R & Yamsani MR, Lozenges formulation and evaluation: A review, IJAPR, 2014, 1, 290-294.
5. Meghwal M, Goswami TK, Chemical Composition, Nutritional, Medicinal And Functional Properties of Black Pepper: A Review, Open Acc Sci Rep 2012, 1,1-5.
6. Kolekar, Yogesh & Mulani, Sajid & Tamboli, Firoj & Harinath, N. & Misal, Ashish. (2021). FORMULATION AND EVALUATION OF PEDIATRIC HERBAL CHOCOLATE. 8. 458-462.
7. Dwivedi, Mahendra & Jha, K & Pandey, Swati & Sachan, Ankush & Sharma, Himanshu & Dwivedi, Shloke. (2023). Formulation and Evaluation of Herbal Medicated Chocolate in Treatment of Intestinal Worms and Related Problems. 11. 2022.
8. Kupkar, Mayuri & Kusarkar, Priyanka & Dudhgaonkar, Trupti. (2022). A Study on Formulation and Evaluation of Herbal Chyawanprash Chocolate. Research Journal of Pharmaceutical Dosage Forms and Technology. 123- 126. 10.52711/0975-4377.2022.00019.
9. Paul Roy, Shibhanjan & Deka, Kamal & Prakash Rai, Shyam. (2023). ~ 1210 ~ The Pharma Innovation.
10. Paul Roy, Shibhanjan & Deka, Kamal & Prakash Rai, Shyam. (1998). By using arabian artemesia sieberi and Liliium candidum a novel formulation and development of herbal based ointment for deep burn healing.
11. Paul Roy, Shibhanjan & Deka, Kamal & Prakash Rai, Shyam & Mishra, Pratyush. (2023).
12. SHIBANJAN PAUL ROY ET AL FORMULATION OF A NOVEL HERBAL BASED SHAMPOO FOR HAIR FORMULATION OF A NOVEL HERBAL BASED SHAMPOO FOR HAIR SHIBANJAN PAUL ROY ET AL FORMULATION OF A NOVEL HERBAL BASED SHAMPOO FOR HAIR Introduction.
13. Sarma, Satyabrat & Paul Roy, Shibhanjan & Prakash Rai, Shyam. (2023). The Pharma Innovation Journal 2023; 12(3): 4595-4603 Novel formulation and evaluation herbal based lotion for the antimicrobial and antifungal properties.
14. Paul Roy, Shibhanjan. (2023). FORMULATION AND EVALUATION A NOVEL HERBAL BASED FACE WASH BY USING HYDNORAAFRICANA (SUB FAMILY-HYDNORACEAE) FRUIT EXTRACT.
15. Allen, L.V., Ansel, H.C., Popovich, N.G. (2010). "Ansel's Pharmaceutical Dosage Forms and Drug Delivery Systems." Lippincott Williams & Wilkins. [ISBN: 978-0781779340]
16. Banker, G.S., Anderson, N.R. (1987). "Tablets." In: Lachman, L., Lieberman, H.A., Kanig, J.L. (Eds.), "The Theory and Practice of Industrial Pharmacy." Lea & Febiger. [ISBN: 978-0812110790]

17. Chaudhary, S., Sridhar, B.K. (2014). "Herbal Lozenges: A Review." *International Journal of Research in Pharmacy and Chemistry*, 4(2), 234-241.
18. Garg, R., Gupta, G.D. (2014). "Formulation and Evaluation of Herbal Lozenges Containing Aloe Vera and Tulsi." *International Journal of Pharmacy and Pharmaceutical Sciences*, 6(9), 307-310.
19. Jain, V., Lodhi, S. (2013). "Preparation and Evaluation of Herbal Lozenges." *Asian Journal of Pharmaceutical and Clinical Research*, 6(Suppl 1), 238-241.
20. Khurana, S., Kumar, P., Lal, B., Prasad, A.K. (2015). "Development and Evaluation of Herbal Lozenges." *International Journal of Pharmacy and Pharmaceutical Sciences*, 7(3), 94-96.
21. Patel, R., Patel, M., Patel, N. (2011). "Formulation and Evaluation of Herbal Lozenges Containing Polyherbal Extracts of Ginger, Tulsi, and Turmeric." *International Journal of Pharmacy and Pharmaceutical Sciences*, 3(4), 189-191.
22. Phani Kumar, G., Veerareddy, P.R. (2015). "Formulation and Evaluation of Herbal Lozenges Containing Green Tea Extract." *Asian Journal of Pharmaceutical and Clinical Research*, 8(3), 232-235.
23. Rathi, N., Swami, A. (2014). "Formulation and Evaluation of Herbal Lozenges." *International Journal of Research in Pharmaceutical and Biomedical Sciences*, 5(1), 163-170.
24. Shirsat, R.S., Kadam, D.V. (2012). "Development and Evaluation of Herbal Lozenges Containing Emblica Officinalis Extract for Prevention of Mouth Ulcer." *International Journal of Pharmacy and Pharmaceutical Sciences*, 4(Suppl 5), 97-100.