



Research Article

Formulation and Evaluation of Lemongrass Lotion

Vishakha Shinde*¹ and Kundan Tiwari²

¹ Student, SMBT Institute of Diploma Pharmacy, Nandi-hills Dhamangaon, Nashik, India, 422403.

² Asst. Professor, SMBT Institute of Diploma Pharmacy, Nandi-hills Dhamangaon, Nashik, India, 422403.

ARTICLE INFO

Article history:

Received: 17/11/2020;

Revised: 20/11/2020;

Accepted: 23/11/2020;

Available online:

23/11/2020.

Key Words:

Herbal formulation,

Triethanolamine,

Stearic acid.

ABSTRACT

There is increased scientific evidence that plants possess a vast and complex arsenal of active ingredients which have the ability to calm or smooth the skin as well as restore actively, heal and protect the skin. The present work deals with the development and evaluation of the herbal lotion containing Lemongrass. Different types of formulations oil in water (O/W) herbal lotions namely F1 to F3 were formulated by incorporating different concentrations of Stearic acid and Triethanolamine. The prepared lotion was evaluated for its pharmaceutical parameters.

Please cite this article as: Shinde V., *et al.*, (2020). Formulation and Evaluation of Lemongrass Lotion. *International Journal of PharmaO₂*, 2(6), 0390-0394.

©2020 Published by International Journal of PharmaO₂. This is an open access article.

*Corresponding author: Ms. Vishakha Shinde, Student, SMBT Institute of D. Pharmacy, Dhamangaon, Nashik, Maharashtra-422401, India. Contact:+91-7083388254; e-mail: vishakhashinde2024@gmail.com

Introduction

Lemongrass (*Cymbopogon flexuosus*) and (*Cymbopogon Citraus*) is native aromatics tall sedge/ grass belongs to family *Poaceae/Gramineae* with diverse medicinal values (Rajendra Jangde, S. J. Daharwal 2011), (Viabhav Srivastava, Subhodh Dubey 2013). The appearance and function of the skin are maintained by an important balance between the water content of the stratum corneum and skin surface lipids. The skin represents the most

superficial layer of the body and so it is constantly exposed to different environmental stimuli. Exposure to external factors as well as endogenous factors may disrupt this balance. In addition, frequent use of soaps, detergents and topical irritants such as alcohol and hot water can remove the skin surface lipids. Disruption of skin barrier led to various types of skin problems most common condition is loss of water content which lead to dryness of skin such as roughness, scaling, cracks, redness and an uncomfortable

feeling of tightness, sometimes with itching and stinging. Treatment with moisturizers aims at maintaining skin integrity and the well-being by providing a healthy appearance of the individual. Today's skin-care consumer is presented with a wide array of available products to treat dry skin and the choices for the individual consumer seem endless. (Mukund Manikrao Donglikar 2017), (Kapoor Shweta, Saraf Swarnlata 2010).

Herbal extracts are primarily added to cosmetic preparations due to several associated properties such as antioxidant, antibacterial and anti-inflammatory properties. The lotion as topical suspensions, solutions and emulsions are usually serve as vehicles for topically applied drugs, as emollients, or as protective or occlusive dressings, or they may be applied to the skin and membranes such as the rectal, buccal, nasal, and vaginal mucosa, urethral membrane, external ear lining, or the cornea. But the serious problems associated with the formulation and manufacture of topical-mucosal preparations is the establishments of reliable techniques for their characterization, mainly because of the complexity of their physical structure Herbal remedies enrich the body with nutrients and other useful minerals. There is increased scientific evidence that plants possess a vast and complex arsenal of active ingredients which not only have the ability to calm or smooth the skin but also to restore actively, heal and protect the skin. An herbal lotion that can give effective protection to skin and free from any toxicity or toxic residue or irritation when regularly used should be cosmetically acceptable the objective of the present paper was development of formulation of lotion from herbal extracts and their evaluation. (Rajendra Gyawali, Nira Paudel 2016).

Lemon grass is a tall plant having enormous striped leaves with an uneven edge. It is known for its smoky, sweet, herbaceous and lemony fragrance. *Cymbopogon flexuosus* is broadly utilized in preparation of soups curries and teas. This herb contains calming character. Lemon grass (*Cymbopogon flexuosus*) is native sweet-smelling tall sedge. It is a member of the family Poaceae. It grows in numerous parts of the tropical and sub-tropical South East Asia and Africa.

Lemon grass (*Cymbopogon citratus*)

It belongs to the genus *Cymbopogon* of aromatic grasses and contains essential oils with the fine lemon flavor. In Asia Lemongrass is widely used as essential component for health. In India it is use as sedatives for the central nervous system. The *Cymbopogon* essential oils are characterized by the monoterpene constituents like limonene, citral, elemol, citronellal, 1, 8 cineole, citronellol, linalool, geraniol, methylheptenone, b-carophyllene, geranylformate and geranyl acetic acid derivation. Chemical characterization of essential oils is generally done with the use of GC-MS. Citral is one of the significant ingredients of the oil present in a few species of *Cymbopogon* with huge modern uses, for example, crude material for vitamin A, confectionery and perfumery. It grows a bit of the tropics by tucking a group of lemongrasses into a pot or nursery bed. This herb brings the textural magnificence and development of a fancy grass to the nursery, alongside one extra feature: lemony leaves with a trace of ginger. It leaves the ground when warm nights arrive. It looks for new stalks to rise. Combine lemongrass with chile peppers, garlic and cilantro for the makings of Asian and Thai cooking. In cold regions, a stalk is digin late summer and spots it into a pot to develop inside through winter. *Cymbopogon citratus* a herb which is known throughout world as lemon grass is widely used as a source of medicines in tropical countries. Plant leaves are utilized as tea and is generally used in Brazil as analgesic, antipyretic, spasmolytic, tranquilizer, anti-inflammatory and diuretic and. This plant contains 1–2% essential oil on a dry base. The chemical composition of the lemon brass oil (LGO) broadly different due to its genetic diversity, habitat and the agronomic treatment of this plant. Lemon grass essential oil is comprised up of a high content of citral (geranial and neutral isomers), which is used as a source for the production of beta carotene and vitamin A etc. Antimicrobial action of LGO is used for various pathogenic fungi. Lemon grass is a native tropical Asia and now-a-days it grows worldwide. Because of its slight citrus flavor, dried and fresh leaves of the lemongrass are common ingredients of the Asian cuisine in

curries, teas and soups, it also suitable for the poultry, seafood and fish. This herb is widely consumed as an aromatic herb Latin and African countries. In addition, its aerial components are widely utilized in folk medicine for the treatment of digestive disorders, diabetes, nervous disorder, inflammation and fever. Functional lemongrass components have been recognized in recent years. A strong contribution to the antioxidant and anti-inflammatory characteristics of an important oil-free lemongrass infusion has been recognized as mono- and polymeric flavonoids, such as apigenin glycosides, luteolin and proantho cyanidins. (Mahouachi Wifek, Asma Saeed 2016).

Lemon grass is large, perennial sedge, which is a dense rhizome with dense leaf clusters. The cliff is erect, up to a height of 1.8 meters. Leaves are long, glaucous, green, which tapered upwards linear and along the margins; ligule (a part of leaf that is found at the junction of the blade and leaf sheath) very short; its sheaths are cylindrical, barren shoots widened at the base and tightly clasping at the bottom, others narrow and separating. It is a short day plant and produce plentiful flowering in South India. The inflorescence is approximately 1 meter long. Lemongrass is an aromatic plant belonging to the Gramineae family. It possesses higher quality of essential oils and lower cost of production. It is a large, clumped, perennial grass that grows up to a height 1 m. The leaf blades are linear, conical at both ends and can expand to 50 cm in length and 1.5 cm in width. The shape of leaf-sheath is tubular and it acts as a pseudo-stem. This plant generates flowers in mature growth phases.

Material and Method

Plant Lemongrass was collected from Nandi hills near by our institute. Their taxonomic identify was confirmed using local flora. The plants were washed three times in running tap water to remove the soil particles and other unwanted waste materials. Cleaned plants were chopped into small pieces and shade dried at room temperature. The dried plant samples were pulverized using a blender and the powder were collected in a clean glass bottles and stored until further use.

Preparation of extract

About 500 g of dried powder of plant was extracted in ethanol for seven days with frequent agitation. The extraction process was carried out three times with the same sample. The filtrates were collected and evaporated in a water bath. Lemon juice obtained by squeezing was further concentrated in water bath.

Formulation

Table 1: Formulation of Herbal Lotion

Ingredients	F1	F2	F3
Extract of Lemongrass	1.0	1.5	2.0
Stearic acid	11	11	11
Cetyl alcohol	4	4	4
Almond Oil	4	4	4
Glycerol	3	3	3
Methyl Paraben	0.02	0.02	0.02
Triethanolamine	q.s.	q.s.	q.s.
Water q.s. 100	q.s.	q.s.	q.s.

Evaluation of Formulation

Preliminary Pharmaceutical evaluation of lotion formulations was carried out as follows:

Physical Parameters

Appearance, color and homogeneity are determined. Results are shown in the Table 2.

Subjective Properties

Consistency, feel on application and irritation parameters are determined and results are shown in the Table 2.

Spread ability

Two glass slides of standard dimensions (20 × 5 cm) were selected. The formulation was over one of the slide. The other slide placed on the top of the cream such a that the formulation sandwiched between the two slides in an area occupied by a distance of 7.5 cm, alongside 100 gm weight was placed uniformly to form a thin layer. The weight was removed and the excess of cream adhering to the slides was scrapped off. The two slides in a position were fixed to stand (45° angle) without slightest disturbance and in such a way that only the lower slide held firmly by the opposite fangs of the clamps allowing the upper slide to slip off freely by the force of weight tied to it. 60 gm of weight was tied to the upper slide carefully. The time taken for the upper slide to travel the distance of 5 cm and separate away from the lower slide under the direction of weight was noted. The experiment repeated for 3 times and

the mean taken for three such dimensions was calculated. The results were recorded. The Spread ability is calculated by using formula: $S = M \cdot L / T$ Where, S= Spread ability, L= Length of glass slide, M= Weight tied to the upper slide and T= Time. In present experiment M= 60 gm and L= 7.5 cm. The data showing the Spread ability of different formulation are in the Table no 02.

pH Determination

Lotion pH was measured with a digital pH meter. 10% solution of lotion was prepared and the solution was immersed in the pH meter and the measured pH was recorded. The results are shown in the Table 2.

Viscosity

Viscosity of creams was measured by the Brookfield viscometer. The correct spindle was selected (spindle no. 4) for the given product then the operating condition was setup. Then the

viscosity was measured directly at 6 rpm speed by keeping the torque constant. The mean was obtained. The results are shown in the Table no 02. The viscosity is determined by following formula:

Viscosity = Dial Reading \times Factor. For LV-4 at 6 RPM Factor is 1M (1000)

Sensitivity Test

A portion of lotion was applied on the forearms of 6 volunteers and left for 20 minutes. After 20 minutes any kind of irritation if occurred was noted.

Washability Test

A portion of lotion was applied over the skin of hand and allowed to flow under the force of flowing tap water for 10 minutes. The time when the lotion completely removed was noted.

Type of emulsion test

Dye solubility and dilution test was conducted to determine the type of emulsion formed.

Table 2: Evaluation of Herbal Lotion

Parameters	F-I	F-II	F-III
Appearance	Cream like	Cream like	Cream like
Color	Reddish brown	Reddish brown	Reddish brown
Homogeneity	Uniform and homogeneous	Uniform and homogeneous	Uniform and homogeneous
Consistency	Good	Good	Good
Texture	Smooth	Smooth	Smooth
Irritation	No	No	No
Spread ability	22.73	20.41	19.88

Result and Discussion

A majority of the world's population in developing countries still relies on herbal medicine to meet its health needs and because of this extensive research is now being carried out in this area. The pH of the prepared cream with the extract was found to be around 6 which is suitable for topical application because the pH of the skin is between 4.5– 6. The spreadability studies showed that formulation have better spreadability when compared with the marketed cream. This is perfectly challenged to Marketed Creams. The results of pH and spreadability are summarized in table no.02. The stability studies of the various parameters like visual appearance, nature, pH of the formulations showed that there was no significant variation after two months of the study period and the results are summarized

in table no. 02. The formulation I and II shows no redness, edema, inflammation and irritation during Patch Test studies. These formulations are safe to use for skin. There is more scope for pathogenic microorganisms study culturing it with agar medium.

Acknowledgement

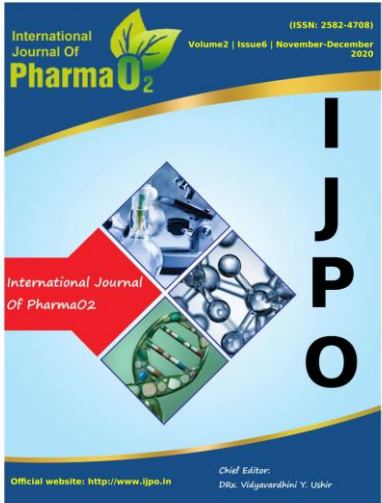
Authors thanks to management of S.M.B.T. Sevabhavi Trust's, SMBT Institutes of Diploma Pharmacy, Nashik, India for providing facility during work.

Conflicts of Interests

Authors do not have any conflicts of interest with the publication of the manuscript.

References

1. Jangde, R., Daharwal, S.J. (2011). Herbal Sunscreen: An Overview, Research J. Topical and Cosmetic Sci, 2(2), 35-39.
2. Donglikar, M.M., Deore, S.L. (2017). Development and Evaluation of Herbal Sunscreen, Pharmacogn J., 9(1), 83-97.
3. Dons, T., Soosairaj, S. (2018). Evaluation of wound healing effect of herbal lotion in albino rats and its antibacterial activities, Dons and Soosairaj Clinical Phytoscience, 4(6), 1-7.
4. Rasheed, A., Shama, S.N. (2012). Formulation, characterization and in vitro evaluation of herbal sunscreen lotion, Orient Pharm Exp Med, 12, 241-246.
5. Kale, S., Kulkarni, K., Gajare, G. (2017). Formulation And In Vitro Evaluation For Sun Protection Factor For Oil From Resin of Commiphora Mukul Sunscreen Cream, Int J Pharm Bio Sci, 4(2), 182-188.
6. Gyawali, R., Paudel, N., Shrestha, S., Silwal, A. (2016). Formulation and Evaluation of Antibacterial and Antioxidant Polyherbal Lotion, Jist, 21(1), 148-156.
7. Kapoor, S., Saraf, S. (2010). Formulation and Evaluation of Moisturizer Containing Herbal Extracts for the Management of Dry Skin, PHCOG J, 2(11), 409-418.
8. Wifek, M., Saeed, A., Rehman R. and Nisar, S. (2016). Lemongrass: a review on its botany, properties, applications and active components, IJCBS, 1, 79-84.
9. Mali, A.S., Karekar, P., Yadav, A.V. (2015). Formulation and Evaluation of Multipurpose Herbal Cream, International Journal of Science and Research, 4(11), 1495-1498.
10. Joy, P.P., Skaria, B.P., Mathew, S. (2006). Lemongrass, Kerala Agricultural University Aromatic and Medicinal Plants Research Station, 1-23.
11. Srivastava, V., Dubey, S. (2013). A Review on Lemongrass: Agricultural and Medicinal Aspect, Int. Res. J. Pharm., 4(8), 42-44.



International Journal Of PharmaO₂
Volume 2 | Issue 6 | November-December 2020
(ISSN: 2582-4708)

**I
J
P
O**

International Journal Of PharmaO₂

Official website: <http://www.ijpo.in>

Chief Editor:
Dr. Vidyavardhini Y. Ushir

IJPO is

- Peer reviewed
- Bi-monthly
- Rapid publication
- Submit your next manuscript at journalpharma02@gmail.com