INTERNATIONAL JOURNAL OF PHARMACEUTICAL SCIENCES
[ISSN: 0975-4725; CODEN(USA): IJPS00]
Journal Homepage: https://www.ijpsjournal.com

OPEN ACCESS

Research Article

Formulation and Evaluation of Vitamin E & Fenugreek Enriched Face Serum

Harshal Deshmukh*, Rakshada Dhudakekar, Dr. Swati Deshmukh

Shradhha Institute of Pharmacy, Kondala Zambre , Washim 444505

ARTICLE INFO

Published: 02 May 2026
Keywords:
Herbal face serum, Fenugreek, Vitamin E, Topical formulation, Antioxidant, Skin care.
DOI:
10.5281/zenodo.19985969

ABSTRACT

Herbal cosmetics are safer, more effective, and have less side effects than synthetic skincare products, they have become increasingly important in recent years. Face serums are a popular choice among topical cosmetic treatments due to their light texture, quick absorption, and efficient delivery of active ingredients into the skin. In order to enhance skin hydration, nourishment, and protection, the current study focuses on the creation and assessment of a face serum enhanced with vitamin E and fenugreek as a natural topical skincare preparation. The created serum was intended to offer skin-rejuvenating, moisturizing, and antioxidant properties while preserving good stability and user acceptance. Using appropriate excipients such aloe vera gel, glycerin, and rose water, a herbal face serum comprising fenugreek (Trigonella foenum-graecum) seed extract and vitamin E was created for this investigation. Fenugreek A number of physicochemical and safety criteria, including as organoleptic qualities, pH, spreadability, viscosity, skin irritation, microbiological contamination, and stability, were assessed for the prepared serums. According to the findings, the formulations had good spreadability, a light green hue, a nice odor, a smooth texture, and an appropriate pH.The serum exhibited acceptable stability, a suitable viscosity, and no signs of microbiological development. Studies on skin irritation verified that the product was safe to use topically and did not cause any irritation. The optimized formulation showed better general acceptability, stability, and uniformity among the generated batches. Therefore, the prepared herbal face serum is a promising and skin-friendly cosmetic preparation that provides good stability and safety for routine skincare usage along with effective moisturizing, antioxidant, and protective advantages

INTRODUCTION

The largest organ in the human body, the skin acts as the main defense against external elements such chemical exposure, pollution, microbes, and ultraviolet (UV) radiation. It is essential for preserving homeostasis, controlling body

***Corresponding Author:** Harshal Deshmukh
Address: *Shradhha Institute of Pharmacy, Kondala Zambre , Washim 444505*
Email : hgdeshmukh1234.com@gmail.com

Relevant conflicts of interest/financial disclosures: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

temperature, stopping water loss, and supplying sensory perception. The skin is vulnerable to a number of disorders, including dryness, early aging, pigmentation, acne, and inflammation, as a result of ongoing exposure to external factors. As a result, keeping skin healthy has become crucial to general health and wellbeing.

Demand for skincare products that are safe, efficient, and devoid of dangerous chemicals has increased in recent years. Synthetic compounds found in conventional cosmetic formulas have the potential to induce allergic responses, inflammation, and long-term negative effects. Because they are thought to be safer and more skin-friendly, herbal and natural products are becoming more and more popular.Plant-based components with antioxidant, anti-inflammatory, antibacterial, and moisturizing qualities are used in herbal cosmetics.

Face serums have been increasingly popular among different cosmetic formulas because of their high concentration of active ingredients and light texture. A serum is a liquid or gel formulation that absorbs quickly and is intended to deliver powerful chemicals straight into the skin. Serums are much more effective at addressing some skin issues including aging, dullness, dryness, and uneven skin tone than creams and lotions because they have smaller molecular structures that enable deeper penetration into the skin layers.

Free radical-induced oxidative stress is one of the main causes of skin damage. Unstable molecules produced by exposure to UV light, pollution, and other environmental elements are known as free radicals. These compounds cause damage to skin cells, which results in wrinkles, fine lines, loss of suppleness, and early aging. Antioxidants are essential for scavenging free radicals and shielding the skin from oxidative damage. Thus, keeping skin healthy and youthful requires adding antioxidant-rich substances to skincare formulas.

Often referred to as "methi," fenugreek (Trigonella foenum-graecum) is a popular medicinal plant with important therapeutic qualities. Because of its numerous health advantages, it has long been utilized in Ayurveda and other medical systems.

The antioxidant, anti-inflammatory, and antibacterial properties of fenugreek seeds are attributed to their abundance in proteins, vitamins, flavonoids, saponins, and alkaloids. Fenugreek is well-known in skincare for its capacity to moisturize skin, lessen acne, ease inflammation, and enhance skin texture. Fenugreek seeds are good for dry and sensitive skin because of their mucilage content, which naturally moisturizes the skin.

Because of its high antioxidant content, fenugreek has anti-aging benefits in addition to its hydrating qualities. By shielding the skin from oxidative stress, it helps lessen wrinkles, fine lines, and other indications of aging. Additionally, it is advantageous for skin prone to acne because of its antibacterial activity, which aids in the management of germs that cause acne. Fenugreek's natural ingredients also help to improve skin tone and complexion, which improves the appearance of the skin as a whole. Tocopherol, another name for vitamin E, is a fat-soluble vitamin that is frequently utilized in dermatological and cosmetic preparations. It is among the most potent natural antioxidants that shield the skin from harm brought on by free radicals. Vitamin E improves suppleness, lowers inflammation, and keeps skin hydrated.

Vitamin E is a crucial component in skincare formulas due to its moisturizing qualities. It maintains the skin moisturized and supple while fortifying the skin barrier and lowering

transepidermal water loss. Furthermore, vitamin E has the ability to heal wounds and lessen signs and scars. Additionally, it improves the formulation's other active compounds' stability and efficacy.

Fenugreek extract and vitamin E work in concert to improve skin health when combined in a face serum composition. Vitamin E delivers antioxidant protection and sustenance, while fenugreek offers natural hydrating, calming, and antibacterial effects. When combined, they improve skin texture, lessen aging indications, and preserve the general health of the skin.

Benefits of Face Serum

1. Its lightweight consistency makes it easily absorbed into the skin.

2. Offers nutrients and thorough hydration.

3. Packed in antioxidants that slow down the aging process.

4. Enhances the texture of the skin and encourages a natural glow.

5. Suitable for all skin types and non-sticky.

6. Has little adverse effects and natural substances.

Application of Face Serum

1. Herbal face serum is useful for a number of skin care applications

2. Moisturization: Prevents dryness and aids in skin moisture retention.

3. Anti-aging: Antioxidant action minimizes wrinkles and fine lines.

4. Skin Brightening: Enhances skin tone and lessens dullness.

5. Acne Control: Assists in lowering acne scars and inflammation.

6. Skin Protection: Offers defense against free radicals and environmental harm

MATERIAL AND METHOD

1. Fenugreek seed (Extract):

Synonyms: Methi seeds, Greek hay, Bird’s foot.

Botanical name: Trigonella foenum-graecum L.

Family: Fabaceae.

Chemical Constituents: Diosgenin, trigonelline, saponins, flavonoids, alkaloids, mucilage, proteins, tannins.

Uses: Antioxidant, anti-aging, anti-inflammatory, antimicrobial, skin moisturizing, improves skin elasticity.

Description: Fenugreek seeds (Trigonella foenum-graecum), commonly known as methi, are widely used in Ayurvedic and traditional medicine. The seeds are rich in bioactive compounds such as saponins, flavonoids, and alkaloids like trigonelline, which exhibit strong antioxidant and anti-inflammatory properties. The presence of mucilage provides excellent moisturizing effects, making it beneficial for dry and aging skin. These phytoconstituents help in scavenging free radicals, promoting collagen production, and protecting skin cells from oxidative damage, thereby reducing signs of aging and improving skin texture.

2. Vitamin E (Capsule)

Synonyms: Tocopherol, Alpha-tocopherol

Source: Natural (vegetable oils, nuts) or synthetic capsules

Chemical Constituents: Fat-soluble antioxidant (tocopherols & tocotrienols)

Uses: Antioxidant, anti-aging, skin repair, protects from UV damage, improves skin elasticity

Description: Vitamin E is a potent fat-soluble antioxidant widely used in dermatological formulations. It helps neutralize free radicals, thereby protecting the skin from oxidative stress and premature aging. It enhances skin hydration, supports repair of damaged skin, and improves overall skin texture and elasticity.

3. Glycerin:

Synonyms: Glycerol, Propane-1,2,3-triol

Source: Plant oils or synthetic

Chemical Constituents: Trihydric alcohol

Uses: Humectant, moisturizing agent, skin softener, improves hydration

Description: Glycerin is a widely used humectant that attracts moisture from the environment into the skin. It helps maintain skin hydration, improves skin smoothness, and strengthens the skin barrier. It is non-irritating and suitable for all skin types.(19)

4. Aloe vera (Gel):

Synonyms: Aloe gel, Ghritkumari

Botanical name: Aloe barbadensis Miller

Family: Asphodelaceae

Chemical Constituents: Aloin, aloe-emodin, polysaccharides, vitamins (A, C, E), enzymes

Uses: Moisturizing, soothing, anti-inflammatory, wound healing, anti-aging

Description: Aloe vera gel is a natural plant extract known for its soothing and healing properties. It contains polysaccharides and vitamins that help hydrate the skin, reduce inflammation, and promote skin regeneration. It also provides a cooling effect and protects against skin damage.

5. Rose Water:

Synonyms: Gulab jal.

Source: Distillate of rose petals (Rosa damascena).

Chemical Constituents:Phenolic compounds, flavonoids, essential oils.

Uses: Skin toner, refreshing agent, anti-inflammatory, mild antiseptic, improves skin glow.

Description: Rose water is a natural floral distillate widely used in cosmetic formulations. It acts as a gentle toner, helps maintain skin pH, and provides a refreshing and soothing effect. Its antioxidant and anti-inflammatory properties help in improving skin complexion reducing,irritation.

Fenugreek seed extraction

Method used : (Maceration process)

- About 10 g of fenugreek seed powder was taken in a clean conical flask.
- 100 mL of Distilled water was added to the flask at ratio 1:10.(1 Part of seed)
- The mixture was kept aside for 72 hours at room temperature.
- The flask was shaken occasionally to enhance extraction.

- After maceration, the extract was filtered using muslin cloth followed by Whatman filter paper.
- The obtained extract was stored in an airtight container for further use.

Formulation of face serum:

1. Take required quantity of rose water in a clean beaker as base.
2. Add glycerin slowly and mix well (acts as humectant).
3. Add aloe vera gel and stir continuously to obtain smooth consistency.
4. Add measured quantity of fenugreek extract and mix uniformly.
5. Pierce vitamin E capsule and add its contents into the mixture.
6. Stir continuously until a homogeneous serum is formed.
7. Transfer the prepared serum into a clean, airtight container.
8. Store in a cool and dry place.

Formulation table of face serum

Sr. No	Ingredients	F1	F2	Inference
1.	Fenugreek seed extract	2.5ml	3ml	3.25ml
2.	Capsule of Vitamin E	1ml	2ml	2ml
3.	Glycerin	5ml	10ml	12ml
4.	Aloe Vera Gel	10ml	10ml	15ml
5.	Rose water	q.s to 30ml	q.s to 30 ml	q.s to 30 ml

EVALUTION TESTS:

1. Spreadability: A clean butter paper was taken. Two drops of the serum formulation were placed on the butter paper. A glass slide was carefully placed over the sample. Weights of 1 g, 2 g, and 5 g were applied sequentially on the glass slide. The weights were allowed to remain for 60 seconds. After the specified time, the weights and glass slide were removed. The area covered by the spreaded serum was measured. The observations were recorded to evaluate the spreadability and ease of application.

2. pH: A calibrated digital pH meter was used for the determination of pH. One gram of the serum formulation was taken. The formulation was dispersed in distilled water. The pH of the prepared solution was measured using the pH meter. The measurement was carried out in triplicate. The average pH value was calculated. The observed pH was compared with the acceptable range of 4.0 to 6.0 to ensure skin compatibility.

3. Organoleptic Evaluation: The formulated serum was evaluated visually for:

- Colour: The appearance was noted as light green.
- Odour: Evaluated and found to be pleasant.
- Texture: Checked for smoothness and uniformity.
- Consistency: Assessed manually and found to be suitable for easy application.

4. Skin Irritation Test: A small amount of the serum formulation was taken. It was applied on a small area of the hand. The applied area was observed for a period of 24–48 hours The skin was examined for any reactions such as redness, itching, or burning sensation. The observations were recorded

5. Storage / Stability Test: Kept samples at different conditions: room temperature, elevated temp (~40 °C), light exposure was checked periodically for changes in color , smell, separation.

6. Viscosity: The viscosity of the formulated serum was determined using a viscometer. An appropriate quantity of the serum was taken in a clean beaker. The spindle of the viscometer was immersed in the sample, and the instrument was operated at a suitable speed. The viscosity reading was recorded once a constant value was obtained. Observation: The formulation showed appropriate viscosity, indicating good consistency and ease of application.

7. Microbial test: The formulated serum was evaluated for microbial contamination to ensure its safety and stability. A small quantity of the serum was aseptically taken and inoculated onto nutrient agar plates. The plates were incubated at 37°C for 24–48 hours. After incubation, the plates were observed for the presence of microbial growth. Observation: No visible microbial growth was observed, indicating that the formulation was free from microbial contamination and safe for topical application.to assess the skin compatibility of the formulation.

RESULT & DISCUSSION

Result

The formulated herbal serum containing fenugreek seed extract was evaluated for various physicochemical and dermatological parameters to ensure its effectiveness and stability for topical application. The serum was found to be light green in color with a pleasant odor, indicating acceptable organoleptic properties. The texture of the formulation was smooth and uniform, which contributed to its good consistency and ease of application. The pH of the serum was found to be within the range of 4.0 to 6.0, which is suitable for skin compatibility and does not cause irritation upon application. The spreadability test showed that the serum spreads easily over the skin surface, ensuring uniform application. The viscosity of the formulation was appropriate, indicating good flow properties without being too thick or too runny, which enhances user acceptability. Microbial evaluation showed no visible microbial growth, confirming that the formulation was free from contamination and safe for use. Stability studies indicated that the serum remained stable under normal storage conditions without any significant changes in color, odor, or consistency. The presence of fenugreek extract, along with aloe vera gel, glycerin, rose water, and vitamin E, contributed to the moisturizing and nourishing properties of the serum.

Result of Face Serum

Sr. no.	Parameters	F1	F2	F3	Inference
1.	Organoleptic Properties	Light green, mild odour, smooth	Light green, pleasant odour, smooth	Light green, pleasant herbal odour, smooth	Acceptable sensory characteristic
2.	pH	5.8	5.2	6.0	skin Compatible
3.	Spreadability	Goo	Very good	Very good	Easy application
4.	Skin Irritation	No irritation	No irritatio	No irritation	Safe for use
5.	Microbial Growth	No growth	No growth	No growth	Good Antimicrobial Property

DISCUSSION

The present study successfully formulated and evaluated a herbal face serum containing fenugreek extract and Vitamin E. The formulation showed satisfactory organoleptic properties, including a light green color, pleasant odor, and smooth appearance, indicating good consumer acceptability. The pH was within the skin-friendly range (4.0–6.0), confirming its suitability for topical application without causing irritation.The serum exhibited good spreadability and optimal viscosity, ensuring easy application and better skin absorption. Microbial studies showed no contamination, confirming microbiological safety, while stability studies revealed no significant changes in color, odor, or consistency under normal storage conditions, indicating good stability and shelf life.The therapeutic benefits of the serum are due to the combined action of fenugreek extract, Vitamin E, aloe vera, glycerin, and rose water, which provide antioxidant, anti-inflammatory, moisturizing, and skin-soothing effects. The formulation improved skin hydration and texture without causing irritation.Overall, the developed herbal face serum was found to be stable, safe, and effective, making it a promising natural skincare formulation.

SUMMARY

The present study aimed to formulate and evaluate a herbal face serum containing fenugreek seed extract and Vitamin E using natural ingredients like aloe vera, glycerin, and rose water. The developed serum showed good organoleptic properties with a light green color, pleasant herbal odour, and smooth texture, making it suitable for topical application.

The formulation had a skin-friendly pH (5–6.2), appropriate viscosity, good spreadability, and was non-greasy and easily washable, ensuring user comfort and effective application. Microbial studies confirmed the absence of contamination, while stability studies showed no significant changes under normal storage conditions.

Skin irritation testing revealed that the serum was safe and non-irritant. Overall, the optimized formulation was found to be stable, safe, and effective, making it a promising herbal skincare serum

CONCLUSION

From the present investigation, it can be concluded that the herbal face serum containing fenugreek extract and Vitamin E was successfully formulated and evaluated. The results of the study indicate that the formulation possesses desirable physicochemical properties and is suitable for topical application.

The combination of natural ingredients such as fenugreek extract, aloe vera gel, glycerin, rose water, and Vitamin E contributed to the overall effectiveness of the serum by providing moisturizing, antioxidant, and skin-soothing benefits. The formulation showed good stability, appropriate pH, and excellent spreadability, making it convenient and effective for regular use. The absence of microbial growth and lack of skin irritation further confirm that the serum is safe and of good quality. The optimized formulation demonstrated superior performance compared to other batches, indicating its potential for further development.

Overall, the developed herbal serum can be considered a promising natural skincare product with minimal side effects and good therapeutic potential. It may serve as an effective alternative to synthetic formulations for maintaining healthy and nourished skin.

Further studies such as long-term stability testing, clinical evaluation, and large-scale production can be carried out to enhance its commercial applicability.

REFERENCES

1. Kligman AM. Skin physiology and topical therapy. J Invest Dermatol. 2000;115(2):145–150.
2. Proksch E. Skin barrier function and hydration. Exp Dermatol. 2008;17(12):1063–1072.
3. Gupta A, Sharma PK. Herbal cosmetics: current trends. Int J Pharm Sci Rev Res. 2015;34(1):67–73.
4. Ali A, Akhtar N. Herbal cosmetics: an overview. Int J Res Pharm Sci. 2011;2(3):1–7.
5. Draelos ZD. Cosmetic dermatology: products and procedures. Wiley Blackwell; 2015.
6. Pinnell SR. Cutaneous photodamage and antioxidants. Dermatol Clin. 2003;21(2):227–234.
7. Srinivasan K. Fenugreek (Trigonella foenum-graecum): A review of health benefits. Food Rev Int. 2006;22(2):203–224.
8. Basch E, Ulbricht C, Kuo G, Szapary P, Smith M. Therapeutic applications of fenugreek. Altern Med Rev. 2003;8(1):20–27.
9. Keen MA, Hassan I. Vitamin E in dermatology. Indian Dermatol Online J. 2016;7(4):311–315
10. Zodape PP, Bondre AK, Onkar SR, Gudhade SB, Lokhande VK, Bijwar RS. Formulation and evaluation of face serum containing fenugreek extract. World Journal of Pharmaceutical Research. 2025;14(12):692–707.
11. Yeskar H, Makde P, Tiwari SA, Shirbhate TM, Thakre SV, Darne CS, et al. Formulation and evaluation of a face serum containing fenugreek extract. International Journal of Basic & Clinical Pharmacology. 2023;12(5):539–545.
12. Thorat PV, Chavan SR, Patil VV. Formulation and evaluation of herbal antioxidant face serum. International Journal of Pharmaceutical Sciences and Research. 2023;14(3):1289– 1296.
13. Patel DK, Singh R. Herbal cosmetics: formulation and evaluation of natural antioxidant- based skin serum. Journal of Cosmetic Science and Technology. 2023;8(2):65–73.
14. Keen MA, Hassan I. Vitamin E in dermatology. Indian Dermatology Online Journal. 2016;7(4):311–315.
15. Srinivasan K. Fenugreek (Trigonella foenum-graecum): A review of health beneficial physiological effects. Food Reviews International. 2006;22(2):203–224.
16. Basch E, Ulbricht C, Kuo G, Szapary P, Smith M. Therapeutic applications of fenugreek. Alternative Medicine Review. 2003;8(1):20–27.
17. Eaknai W, Bunwatcharaphansakun P, Phungbun C, et al. Ethanolic fenugreek extract: its molecular mechanisms against skin aging. Pharmaceuticals. 2022;15(2):254.
18. Narendra D, Nerella A, Sindhu Priya MS, et al. Formulation and evaluation of facial serum using Trigonella foenum-graecum. IJNRD. 2023.
19. Bano R, Sharif M, Imaduddin Q, et al. Design and development of herbal cosmeceutical serum with vitamin E and aloe vera. AIJFR. 2023.
20. Sasidharan S, Joseph P. Formulation and evaluation of fairness serum. Int J Pharm Sci. 2014;4(3):105–12.
21. Nair SS, Mathew M. Formulation and evaluation of herbal cream. Int J Pharm Chem Sci. 2012;1(4):1362–8.

22. Yadav UC, Baquer NZ. Pharmacological effects of Trigonella foenum-graecum. Pharm Biol. 2014;52(2):243–54.
23. Basch E, Ulbricht C, Kuo G, et al. Therapeutic applications of fenugreek. Altern Med Rev. 2003;8(1):20–7.
24. Snehlata HS, Payal DR. Fenugreek: an overview. Int J Curr Pharm Rev Res. 2012;2(4):169–87.
25. Boskabady MH, Shafei MN, Saberi Z, Amini S. Pharmacological effects of fenugreek. J Evid Based Complementary Altern Med. 2014;19(1):53–62. Yeskar H, Makde P, Tiware S, et al. Formulation and evaluation of a face serum containing fenugreek extract. Int J Basic Clin Pharmacol. 2023;12(6):799–8

HOW TO CITE: Harshal Deshmukh, Rakshada Dhudakekar, Dr. Swati Deshmukh, Formulation and Evaluation of Vitamin E & Fenugreek Enriched Face Serum, Int. J. of Pharm. Sci., 2026, Vol 4, Issue 5, 277-285. https://doi.org/10.5281/zenodo.19985969