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Formulation And Evaluation Of Fennel Extract Herbal Face Toner

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Abstract: Herbal face toners are now popular in the skincare category because they are made from natural things and are gentle and work well. They hydrate the skin and balance the skin pH. This paper talks about how herbal face toners are made and how they help the skin. It explains that these toners can balance the skin's pH level, tighten pores, and keep the skin hydrated. Because the fennel seed toner is natural and chemical-free, it is suitable for all skin types and supports healthy, glowing skin. The formulation aims to offer a safe, affordable, and eco-friendly alternative to synthetic skincare products.

Key Words: Fennel seeds, skincare, chemical-free, herbal toner.

I. INTRODUCTION

Fennel seeds (Foeniculum vulgare), a common culinary spice, have been valued for centuries due to their rich medicinal and cosmetic properties. Traditionally used in Ayurveda and Chinese medicine, fennel seeds are known for their antioxidant, anti-inflammatory, and antimicrobial benefits. These properties make them an ideal natural ingredient in skincare formulations, particularly facial toner. A face toner plays a vital role in skincare routines by balancing skin pH, tightening pores, and refreshing the skin after cleansing. As consumers increasingly seek natural and chemical-free alternatives, the development of herbal-based skincare products has gained significant attention. The present study explores the formulation and efficacy of face toner made from fennel seed extract. Rich in essential oils, flavonoids, and phenolic compounds, fennel seeds can help reduce acne. The toner aims to utilize these bioactive compounds to create a product that not only tones but also nourishes the skin.By evaluating the fennel seed toner, this research contributes to the expanding fields of herbal cosmetics.

2. Different types of toner:-

2.1) HYDRATING TONER – To replenish moisture and soothe and rehydrate the skin, especially beneficial for dry or dehydrated skin.

2.2) EXFOLIATING TONER – To remove dead skin cells, unclog pores, and improve skin texture.

2.3) TREATMENT TONER – To address specific skin concerns like acne, hyperpigmentation, or uneven skin tone.

2.4) BRIGHTENING TONER – This type of toner contains vitamin C to help even out skin tone, reduce dark spots, and give the skin a radiant glow.

3. Mechanism of spray bottle: -

When the top button of the spray bottle is pressed, it pushes down on the grooved button. This action forces air into the dip tube through a pumping motion from the nozzle. As the button is pressed, the pressure inside the tube decreases. Due to this pressure difference, the liquid is drawn up through the tube. The liquid is then released through the nozzle by the actuator as fine mist particles, created by the pressure and force that propel the liquid outward.

Fig1.1 spray bottle images

4. Advantages of spray formulation:-

- The toner spreads evenly across the face and is easier to apply compared to other forms.
- The fine mist particles help the formulation penetrate directly into the skin pores with minimal pressure.
- The spray form of the product helps prevent hydrolysis and unwanted chemical reactions.
- It reduces the risk of contamination or infection by avoiding direct skin contact during use.
- This form allows for faster action, enhanced safety, better effectiveness, and an improved overall appearance.

5. Effects of a toner on Skin

. Toner helps clean leftover dirt, oil, or makeup from the skin. It makes skin feel fresh, tightens pores, and balances pH levels. Toner also prepares skin to absorb creams better. Herbal toners can soothe the skin and reduce redness, making it look healthy and smooth.

6.Advantages of toner:

- Low cost·
- Gives an additional protection layer to the skin·
- Remove excess dirt
- Hydrate the skin.

7.Disadvantages of toner:

- Causing a drying effect or irritation
- Skin sensitivity
- Can interfere with other products

8.Material table

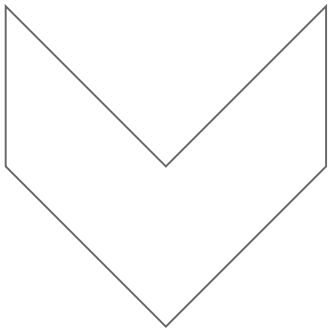
Ingredient	Category
Distilled water	Solvent/base
Fennel seeds extract	Astringent/anti-agent
Sodium benzoate	Preservative
Citric acid	pH adjuster
Propylene glycol	Humectant/penetration enhancer
Rose water	Fragrance
Glycerine	Moisturizer

9. Formulation table

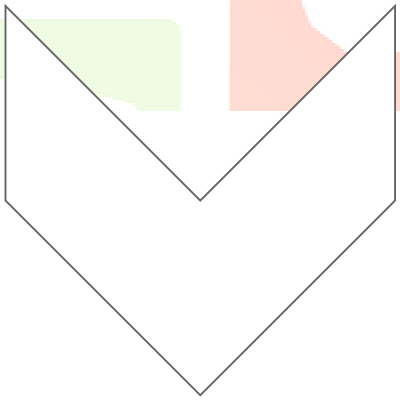
Sr.no	Ingredient	F1	F2	F3	F4	F5	F6
1.	Distilled water	11 ml	11 ml	8 ml	7.5 ml	7 ml	8 ml
2.	Glycerine	2.5 ml	2.5 ml	3 ml	3 ml	3 ml	3 ml
3.	Fennel seeds extract	5 ml	5 ml	4 ml	4 ml	4 ml	4 ml
4.	Sodium benzoate	0.1 gm	0.1 gm	0.1 gm	0.1 gm	0.2gm	0.2 gm
5.	Citric acid	0.5 gm	0.2 gm	0.2 gm	0.2 gm	0.2 gm	0.2 gm
6.	Propylene glycol	1.2 ml	1.2 ml	1.2 ml	1.5 ml	1.5 ml	1.2 ml
7.	Rose water	-	-	2 ml	2 ml	2.5 ml	2 ml

10. Preparation method

Add 7.5 ml of distilled water, 3 ml of glycerine, 1.5 ml of propylene glycol, and 4 ml of fennel extract in a beaker.



Then dissolve 0.1 gm of sodium benzoate in a small portion of water, then add 0.2 gm of citric acid to the above solution.



Mix the solution, then add 2 ml of rose water, filter the solution, and fill in the spray bottle.

11. Direction to use

1. Clean the face with a gentle cleanser.
2. Apply the face toner by using a cotton pad or by spraying it on the face. Allow to air dry and then apply moisturizer or sunscreen.
3. Use twice a day—apply both in the morning and at night.

.12. Evaluation test for herbal face toner

1) Homogeneity:

Homogeneity was analyzed by visual inspection for the appearance and existence of any clog.

2) pH:-

The 20 ml formulation was taken in beaker graduations, and now the calibrated pH meter was made to stand in the formulation for some time, and the reading was recorded.
pH 5.45 was determined by a digital pH meter.

3) Organoleptic Evaluation:-

This involves checking the sensory properties of the toner.
Color—The appearance should match the intended shade.
Off-white color was seen.
Odor—Toner has a pleasant fragrance and no foul smell.
Appearance—Toner clear, non-turbid, and free from suspended particles.

4) Skin irritation:-

A small amount of toner was applied behind the ear, and after observing for 24 hours, there was no redness, itching, or swelling.
This confirms the skin safety of the toner.

5) Stickiness:-

Apply a few drops on the skin and rub gently and check for residue.
The toner was not found to be too sticky.

6) Clarity test:-

Visual inspection under light against a white and black background was done. It ensures that the formulation is clear and transparent. There is no change in color.

7) Pourability:-

Tilt the bottle and observe the flow. The flow of the toner was smooth; it was easily pourable from the bottle.

8) Viscosity:-

Viscosity was measured using an Ostwald viscometer; a viscosity of 2 cP was found, which means it can easily be sprayed or applied with cotton.

9) Spreadability:-

A 2 ml sample was placed on a glass slide, and another 10 gm weighted slide was placed on it for 10 sec. It spread up to 5 cm; by using the following formula, the spreadability was found to be 5 cm^2 in 10 sec.
Formula,
□=□×□/□
Where,
M = weight applied
L = length spread
T = time taken

10) Washability:-

Apply toner on skin and rub gently for a few seconds, and then rinse with water; the toner was easily washed off.

11) Specific Gravity:-

A specific gravity was determined using a specific gravity bottle (pycnometer). A 1.4 g/ml specific gravity was found. It shows slight variation from water due to the presence of glycerine.

12) Antimicrobial Activity:-

To evaluate the antimicrobial activity, the optimized toner formulation was applied to an agar plate, while a control plate without toner was also prepared for comparison. Both plates were incubated at 37°C for 24 hours. After incubation, the plates were examined for microbial growth. The plate containing the toner showed no microbial growth, whereas the control plate exhibited visible microbial colonies, indicating that the formulated toner effectively inhibited microbial growth.

Fig. 1.2 Picture of the final product and its pH evaluation and Ostwald viscometer.

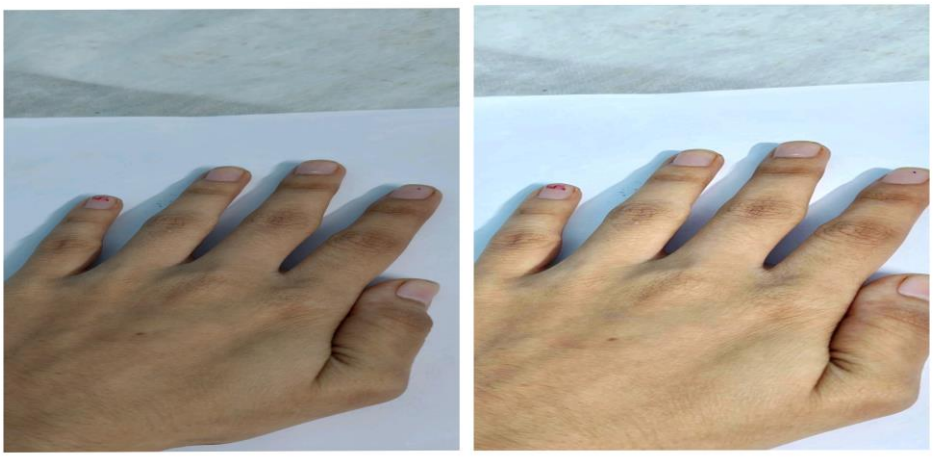


Fig.1.3 The picture of hand before and after application of toner.

13) Conclusion

The spray toner formulation showed excellent performance. All ingredients were freshly sourced from the local market, making the product both cost-effective and practical. The primary goal of the toner was to provide a cooling and toning effect on the skin, which was successfully achieved. Its spray form enhanced ease of application and portability, allowing use anytime and anywhere. No irritation or rashes were observed after application, and the toner also exhibited a mild cleansing effect. The formulation was physico-chemically stable and possessed all characteristics of a standard cosmeceutical skincare product. Compared to gels or lotions, the spray form proved more effective, as the fine mist allowed better penetration into skin pores.

14) Result

The herbal face toner was formulated using distilled water, glycerine, fennel seed extract, citric acid, propylene glycol, sodium benzoate,, and rose water. The toner shows ideal pH, good clarity, no change in color, and non-irritation. . It effectively tightened skin pores, reduced oiliness,, and providedd hydration. And the toner has remained stable at room temperature. The toner exhibited a pleasant fragrance, good spreadability, and easy washability.

15) Reference

1. Indian Pharmacopeia ,2024.
2. Raymond C. Rowe, Paul J Sheskey, Handbook of Pharmaceutical Excipients, 5th edition.
3. Novia Restu Windayani, Octaverina Kecvara Pritasari, Analysis of Data Water Toner to Brighten dry Facial Skin, International Joint Conference on Arts and Humanities, (2021), 618, 950-953.
4. C.K. Kokate, Pharmacognosy, Nirali Publication, (2025), 51th edition.
5. V.D. Rangari, Pharmacognosy and Phytochemistry, (2008), 1(2), 3-4.
6. K.D. Tripathi, Essential of Medical Pharmacology, Jaypee Brothers Medical Publisher, (2004), 5, 8-16.
7. Vibhavari M. Chatur, Sanjay G. Walode, Formulation and Evaluation of Basic Parameters of Herbal Toner Mist for Skin, International Journal of Pharmacy & Pharmaceutical Research, (2021), 21(2), 335-345.
8. Nikhil V. Rajguru, Prof. Ashok S. Jagdale, Preparation and Evaluation of Facial Toner, International Journal of Creative Research Thoughts, (2024), 12(6), 978-986.
9. Ms. Priya Chandele, Mr. Vishal Gaikwad, Exploring Herbal Face Toner as a Skin Care Cosmetics: A Comprehensive Review, Journal of Emerging Technologies and Innovative Research, (2024), 11(6), 228-248.
10. Ashwini Chakote, Chetan D. Mandlik, Preparation and Evaluation of Herbal Face Toner, International Journal of Scientific Development and Research, (2024), 9(6), 360-367.
11. Prof. Gayatri Dusane, Abhay Jejurkar, Preparation and Evaluation of Herbal Face Toner, International Journal of Scientific Development and Research, (2024), 12(6), 88-100.
12. Venu Agrawal, Dr. Manjeet Singh, Formulation and Evaluation of Herbal Toner by using Leaves of Azadriachta Indica: A review, International Journal of Creative Research Thoughts, (2023), 11(8), 616-636.
13. Sriyanty Sadsyam, Nielma Auliah, Antioxidant Evaluation of Facial Toner Formulation containing Ethyl Acetate Fraction from Garcinia Mangostana L. Fruit using ABTS 2,2-Azinobis 3- ethyl benzothiazoline 6- Sulphonic Acid Method, Journal of Health and Medical Development, (2023), 2(2), 94-105.
14. Abdul Aziz Setiawan, Sefi Megawati, Formulation and Activity Tests of Anti-Acne Toner 70% Ethanol Extract Black Garlic, Jurnal Penelitian Pendidikan IPA, (2025), 11(1), 717-723.
15. Dr. Smita More, Nikita Godhave, Formulation and Evaluation of Herbal Toner: A Review, International Journal of Pharmaceutical Sciences Review and Research, (2024), 84(9), 7-14.

16. Vishal Pawar, Prof. Ms. P. R. Nagargoje, Formulation and Evaluation of Herbal Face Toner in the Faculty of Pharmacy, International Research Journal of Moderization in Engineering Technology and Science, (2024), 6(7), 666-680.

17. Sumanji Bala, Tanya Singh, Formulation and Evaluation of Polyherbal Face Toner containing Chrysanthemum Indicum, International Journal of Research and Review, (2024), 11(2), 52-61.

18. Miss. Sapana Mhaske, Miss Vaishnavi Wayal, Formulation and Evaluation of Herbal Face Toner, International Journal of Advanced Research in Science, Communication and Technology, (2022), 2(5), 619-623.

19. Yashaswee Jadhav, Vishal Gaikwad, Formulation and Evaluation of Herbal Face Toner, International Journal of Research Publication and review, (2024), 5(1), 5011-5017.

20. Nilesh Gawali, Vishal Lande, Formulation and Evaluation of Herbal Facial Toner, International Journal of Scientific Research and Technology, (20250, 2(5), 525-534.

21. Anand Bongane, Saurabh Abhale, Formulation and Evaluation of Herbal Face Toner, International Journal of Pharmaceutical Sciences, (2025), 3(4), 9246-9255.

22. Shubhangi Gunjal, Akanksha Somvanshi, Formulation and Evaluation of Herbal Face Toner, International Journal of Advanced Research in Science, Communication and Technology, (2022), 2(1), 786-790.

23. Aman Tyagi, Sunny Antil, To Prepare Herbal Face Toner and Comparative Evaluation with Marketed Herbal Toner, International Journal of Pharmaceutical Research and Application, (2023), 8(4), 2360-2380.

24. Shruti Jingure, Rajbhushan Gunjal, Formulation and Evaluation of Rice Water Toner for Skin, International Journal of Advanced Research in Science, Communication and Technology, (2025), 5(11), 392-397.

25. Komal Mate, Formulation and Evaluation of Herbal Face Toner, International Journal of Research Publication and Review, (2025), 6(5), 13658-13666.

26. Oraphan Aunrukvorakun, Sarunpat Numnim, Development and Clinical Efficacy Evaluation of Facial Toner Containing Houttuynia Cordata Thunb, Multidisciplinary Digital Publishing Institute, (2023), 10, 1-14.

27. Umesh Jadhav, Shubhangi Jadhav, Formulation and Evaluation of Butea Monosperma Facial Toner, Indo American Journal of Pharmaceutical Research, (2025), 15(6), 1-18.

28. Jishkern Ongarchjiyasuk, Naphatsorn Ditthawutthikul, Evaluation of Rhinacanthus nasurus for Utilizing as Sebum- Controlled Face Toner, Science Essence Journal, (2024), 40(2), 1-11.

29. R. Vaidyanathan, B. Anand, Importance of Chemistry in Herbal Cosmeceuticals, Research Journal of Pharmacy and Technology, (2017), 10(12), 4460-4461.

30. Edward Heart, Cosmetic, Journal of the American Chemical Society, (1904), 26, 333-335.

31. M. Parbhane, A. Auto, Formulation and Evaluation of Herbal Toner, World Journal of Pharmacy and Pharmaceutical Science, (2022), 11(9), 784- 797.

32. S. Agaldare, V. Satpute, Face Care Cosmetic: A Review on Herbal Face Toner, World Journal of Pharmaceutical Research, (2023), 12(5), 59-70.

33. Riya Arora, Geeta Aggarwal, Herbal Active Ingredient used in skin Cosmetic: Herbal Actives for Skin, Asian Journal of Pharmaceutical and Clinical Research, (2019), 12(9), 7-15.

34. Nisha Devi, Arvind Kumar, A Review on Herbal cosmetic, World Journal of Pharmaceutical Research, (2018), 7(8), 298-310.

35. Shivtej Patil, Akshada Deshmukh, Formulation and Evaluation of Herbal Toner Prepared using Various Herbal Entities, International Journal of Innovative Research in Technology, (2023), 9(12), 1408-1412.

36. Soni Muhsinin, Zamzami Salsabilla, Formulation and Evaluation of Turmeric Kombucha Facial Toner with potential as an anti-acne agent, Journal of Drug Delivery and Therapeutic, (2023), 13(1), 68-75.

37. Tirth Thaker, Krupa Padariya, Evaluation of Skin-Radiant Toner Formulation from Cucumis sativa and Aloe Indical Royle, International Journal of Biology, Pharmacy and Allied Science, (2023), 12(12), 5721-5726.

38. Dipanwita Chowdhury, Priyanka Ray, Formulation and Evaluation of Herbal Face Mist, Journal of Imovations in Pharmaceutical and Biological sciences, (2020), 7(1), 14-21.

39. Sakshi Khade, Prof. Sandhya Ugale, Review on Herbal used for Glowing Skin, International Research Journal of Modernization in Engineering, Technology and Science, (2024), 6(1), 1-9.

40. Mohit Pal, Ansul Sharma, A detail Analysis of Herbal Cosmetic, Neuro Quantilogy, (2022), 20(15), 6367-6381.

41. Y. Jadhav, V. Gaikwad, Formulation and Evaluation of Herbal Face Toner, International Journal of Advanced Research in Science, Communication and Technology, (2023), 3(12), 619-624.

42. Gayake .R., Bagwan. L. R., Formulation and Characterization of Herbal Face Gel Toner, International Journal of Pharmaceutical Research and Application, (2022), 7(3), 2374-2378.