



IJPPR

INTERNATIONAL JOURNAL OF PHARMACY & PHARMACEUTICAL RESEARCH
An official Publication of Human Journals

ISSN 2349-7203




Human Journals

Research Article


March 2024 Vol.:30, Issue:3

© All rights are reserved by Dr. Shashank Tiwari et al.

Formulation and Evaluation of Herbal Anti-Aging Face Cream in Modern Pharmaceutics



IJPPR
INTERNATIONAL JOURNAL OF PHARMACY & PHARMACEUTICAL RESEARCH
An official Publication of Human Journals



ISSN 2349-7203

Polly Gupta², Dr. Shashank Tiwari^{*1}, Kartikay Prakash³, Nitesh Rajpoot⁴, Harshita Awasthi⁴, Abdul Aleem⁴

*^{*1}Director (Academic and Research), Lucknow Model College of Pharmacy, Lucknow, Uttar Pradesh, India.*

²Associate Professor, Lucknow Model College of Pharmacy, Lucknow, Uttar Pradesh, India.

³Assistant Professor, Lucknow Model College of Pharmacy, Lucknow, Uttar Pradesh, India.

⁴Student, Lucknow Model College of Pharmacy, Lucknow, Uttar Pradesh, India.

Submitted: 20 February 2024
Accepted: 25 February 2024
Published: 30 March 2024

Keywords: Herbal antiaging face cream, formulation, evaluation, modern pharmaceutics, saffron, tulsi, ginger, ashwagandha, cinnamon, turmeric, rose petals, olive oil, antioxidant activity, skin hydration, wrinkle reduction, elasticity enhancement

ABSTRACT

Background: Skin aging is the result of a continual deterioration process because of damage to cellular DNA and protein. The aging process is classified into two distinct types, i.e. “sequential skin aging” and “photo-aging”. Both types have distinct clinical and historical features. **Aim:** The research aims to develop and assess the efficacy of an herbal antiaging face cream within modern pharmaceutics, focusing on texture, stability, and antioxidant activity. It seeks to contribute to the advancement of nature-based skincare solutions in cosmetic pharmaceutics. **Material and Method:** The herbal antiaging face cream was formulated using a blend of saffron, tulsi, ginger, ashwagandha, cinnamon, turmeric, rose petals, olive oil, cetyl alcohol, methylparaben, agar, carbapol 940, stearic acid, glycerine, distilled water, and vanilla essence. The cream's efficacy was evaluated through comprehensive methods in modern pharmaceutics. **Result:** The formulated herbal antiaging face cream demonstrated significant effectiveness in improving skin hydration and elasticity, suggesting its potential as an efficacious cosmetic formulation in modern pharmaceutics. **Conclusion:** In conclusion, the formulated herbal antiaging face cream demonstrates promising efficacy and safety within modern pharmaceutics, offering a natural and effective solution for combating skin aging. Its potent blend of herbal ingredients presents a viable alternative for individuals seeking skincare products with beneficial anti-aging properties.



ijppr.humanjournals.com

INTRODUCTION

Skin aging is a multifaceted process stemming from cellular DNA and protein damage, categorized into "sequential skin aging" and "photo-aging," each with distinct clinical features. While sequential aging involves physiological changes like decreased lipid formation leading to dryness and wrinkles, photo-aging is induced by UV exposure, resulting in skin disorganization. Herbal ingredients have gained prominence in complementary medicine, offering potential in cosmetic formulations to combat aging signs and protect against environmental damage [1].

History:

The quest to combat skin aging dates back to ancient times, evolving through scientific discoveries. Understanding the underlying causes, such as inflammation, has led to advancements like the combination of eggshell membranes and retinol. Traditional herbal remedies have been integral, with civilizations utilizing plants' healing properties. This historical evolution has paved the way for modern anti-aging formulations [2].



Fig 1: History of Anti-aging Treatments

Polyherbal Formulations:

Polyherbal therapy, recognized worldwide for its medicinal value, blends various herbs for therapeutic purposes. India leads in polyherbal research, focusing on treating various ailments, with diabetes being a prominent target. Traditional medicine, rooted in ancient

practices, continues to influence modern pharmacological advancements, emphasizing the significance of herbal remedies.

Herbal Cosmetics:

Herbal cosmetics, formulated with botanical extracts, offer distinct advantages, including antioxidant and antimicrobial properties. The demand for natural products has surged, driven by concerns over chemical-based cosmetics' potential harm. Regulations ensure the safety and efficacy of herbal cosmetics, meeting consumer preferences for natural alternatives in skincare [3].

Herbal Cream:

Herbal creams, designed for topical application, leverage the benefits of botanical ingredients for therapeutic and cosmetic purposes. These formulations, categorized as oil-in-water or water-in-oil creams, target various dermal disorders and provide moisturization. Traditional medicine's integration with modern cosmetic technology yields safe and effective products meeting diverse skincare needs [4].

Human Skin:

Human skin, comprising multiple layers with distinct functions, serves as a vital protective barrier. Factors like aging, UV exposure, and smoking contribute to skin deterioration, leading to wrinkles and pigmentation [5-6]. Understanding skin structure and function is crucial for developing effective anti-aging strategies [7].

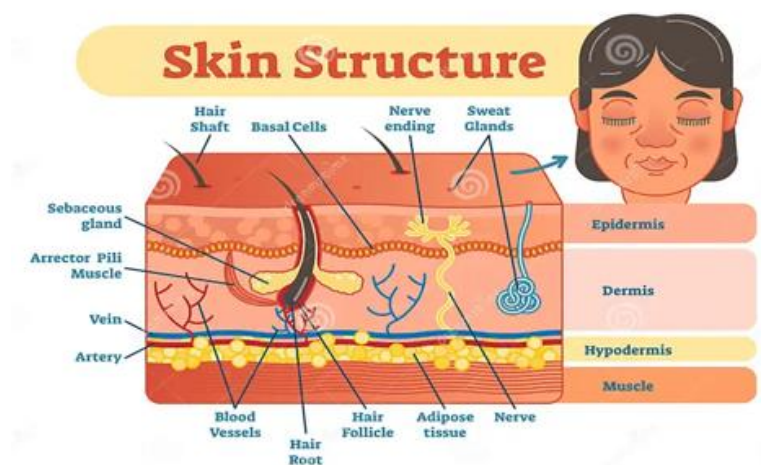


Fig 2: Human Skin Structure

Wrinkles:

Wrinkles, a natural consequence of aging, result from intrinsic and extrinsic factors like genetic predisposition and environmental exposures. The skin's reduced elasticity and collagen production lead to fine lines and sagging. Preventive measures, including sun protection and lifestyle modifications, play a pivotal role in managing wrinkles.

Anti-Aging:

Aging involves complex cellular processes influenced by genetic and environmental factors. Micronutrients and biologically active substances offer potential anti-aging benefits by targeting intracellular pathways. Understanding the molecular mechanisms of aging aids in developing effective anti-aging interventions, mitigating age-related diseases, and promoting longevity [8-10].

MATERIAL

1. Saffron (*Crocus sativus*):

- **Biological Source:** Saffron is derived from the stigma of the *Crocus sativus* flower.
- **Family:** Iridaceae.
- **Pharmacological Activities:** Saffron exhibits antioxidant, anti-inflammatory, antitumor, antidepressant, and memory-enhancing properties. It also has potential benefits in improving cardiovascular health, enhancing sexual function, and promoting skin health by reducing oxidative stress and inflammation [11].

2. Tulsi (Holy Basil) (*Ocimum sanctum*):

- **Biological Source:** Tulsi is obtained from the leaves of the *Ocimum sanctum* plant.
- **Family:** Lamiaceae.
- **Pharmacological Activities:** Tulsi possesses antioxidant, anti-inflammatory, antimicrobial, analgesic, and immunomodulatory properties. It is known for its adaptogenic effects, helping the body cope with stress. Tulsi also promotes wound healing, improves respiratory health, and supports overall well-being [12-13].

3. Ginger (*Zingiber officinale*):

- **Biological Source:** Ginger is derived from the rhizome of the *Zingiber officinale* plant.

- **Family:** Zingiberaceae.
- **Pharmacological Activities:** Ginger exhibits antioxidant, anti-inflammatory, antimicrobial, analgesic, and gastroprotective properties. It aids in digestion, alleviates nausea and vomiting, reduces muscle pain and soreness, and supports cardiovascular health. Ginger also shows promise in managing osteoarthritis and promoting skin health [14].

4. Ashwagandha (*Withania Somnifera*):

- **Biological Source:** Ashwagandha is obtained from the root of the *Withania Somnifera* plant.
- **Family:** Solanaceae.
- **Pharmacological Activities:** Ashwagandha is an adaptogenic herb with antioxidant, anti-inflammatory, immunomodulatory, and neuroprotective properties. It helps the body adapt to stress, improves cognitive function, enhances stamina and endurance, and supports reproductive health. Ashwagandha also promotes skin regeneration and wound healing [15-16].

5. Cinnamon (*Cinnamomum verum*):

- **Biological Source:** Cinnamon is derived from the inner bark of the *Cinnamomum verum* tree.
- **Family:** Lauraceae.
- **Pharmacological Activities:** Cinnamon exhibits antioxidant, anti-inflammatory, antimicrobial, antidiabetic, and cardioprotective properties. It helps regulate blood sugar levels, improve insulin sensitivity, lower cholesterol, and reduce inflammation. Cinnamon also promotes digestive health, boosts immunity, and supports skin health [17].

6. Turmeric (*Curcuma longa*):

- **Biological Source:** Turmeric is obtained from the rhizome of the *Curcuma longa* plant.
- **Family:** Zingiberaceae.
- **Pharmacological Activities:** Turmeric contains curcumin, which possesses antioxidant, anti-inflammatory, anticancer, neuroprotective, and hepatoprotective properties. It helps reduce pain and inflammation, improve digestion, enhance cognitive function, and support

liver health. Turmeric also promotes heart health, boosts immunity, and enhances skin complexion [18].

7. Rose Petals (*Rosa spp.*):

- **Biological Source:** Rose petals are derived from various species of the *Rosa* genus.
- **Family:** Rosaceae.
- **Pharmacological Activities:** Rose petals exhibit antioxidant, anti-inflammatory, antimicrobial, and astringent properties. They help soothe irritated skin, reduce redness and inflammation, promote collagen production, and improve skin texture. Rose petals also have aromatherapeutic effects, promoting relaxation and stress relief [19].

8. Olive Oil (*Olea europaea*):

- **Biological Source:** Olive oil is extracted from the fruit of the *Olea europaea* tree.
- **Family:** Oleaceae.
- **Pharmacological Activities:** Olive oil contains monounsaturated fatty acids, polyphenols, and vitamins, which contribute to its antioxidant, anti-inflammatory, cardioprotective, and skin-nourishing properties. It helps moisturize and soften the skin, protect against UV damage, reduce inflammation, and promote wound healing. Olive oil also supports heart health, improves lipid profile, and enhances overall well-being.

2.2 Chemicals

Cetyl alcohol, Methylparaben, Agar, Carbopol 940, Stearic acid, Glycerine, Distilled water and Vanilla essence were collected from the chemical storeroom of Lucknow Model College of Pharmacy, Lucknow.

1. **Cetyl Alcohol:** Cetyl alcohol is a fatty alcohol commonly used in skincare products as an emollient and thickening agent. It helps in stabilizing the cream's texture and providing a smooth, creamy consistency.
2. **Methyl Paraben:** Methylparaben is a preservative used to prevent microbial growth in cosmetic formulations. It ensures the stability and shelf-life of the face cream by inhibiting the growth of bacteria, yeast, and molds.
3. **Agar:** Agar is a natural gelling agent derived from seaweed. It helps in thickening the cream and providing a desirable texture.

4. **Carbopol 940:** Carbopol 940 is a synthetic polymer used as a thickening agent and emulsifier in cosmetic formulations. It helps in stabilizing the cream's texture and improving its spreadability on the skin.
5. **Stearic Acid:** Stearic acid is a saturated fatty acid derived from vegetable oils. It acts as an emulsifier and emollient in the face cream, helping to bind water and oil components together and maintain skin hydration.
6. **Glycerine:** Glycerine is a humectant that attracts moisture to the skin, keeping it hydrated and supple. It helps prevent dryness and maintains the skin's natural moisture balance.
7. **Distilled Water:** Distilled water serves as a solvent and diluent in the formulation, helping to dissolve and disperse other ingredients evenly throughout the cream.
8. **Vanilla Essence:** Vanilla essence is added to provide a pleasant fragrance to the face cream, enhancing the overall sensory experience of using the product.

METHOD

Extraction of all API by using (The maceration process of extraction)

Maceration

Maceration is one of the simplest extraction techniques in which coarse and powdered plant material is soaked in solvents such as methanol, ethanol, ethyl acetate, acetone, hexane, etc. It is one of the popular and inexpensive techniques used for the extraction of different bioactive compounds from plant material. However, the maceration procedure has certain limitations such as low extraction yield, lower efficiency, and use of large amounts of solvents which have some health hazards. Furthermore, the selection of an appropriate solvent is important in the methodology for the extraction of a particular plant extract.

3.2.2 Extraction of all API

- The maceration process consists of powder from all APIs (Saffron, Tulsi, Ginger powder, Ashwagandha powder, Cinnamon powder, Turmeric Powder, and Dry Rose Petal powder).
- We take powder from all APIs because we need smaller particles to increase the surface area for easy mixing with solvent and efficient extraction of compounds.
- The principle of soaking Saffron Dry and others in powder form by using a suitable irradiation solution with several stirring times.

- Times at room temperature.
- Saffron and other powder extraction by maceration method using ethanol and water with a ratio of 1:10 for 6 x 24 hours,
- Then proceed with ultrasonic, then macerated, and then filtered.
- The liquid extract from each extraction method was evaporated in a water bath until a viscous extract was obtained [20-21].



Fig 3: Saffron and other APIs in powder from



Fig 4: APIs in Hydro alcoholic solution



Fig 5: Filtration



Fig 6: Evaporation of solvent to obtain Solid Extract

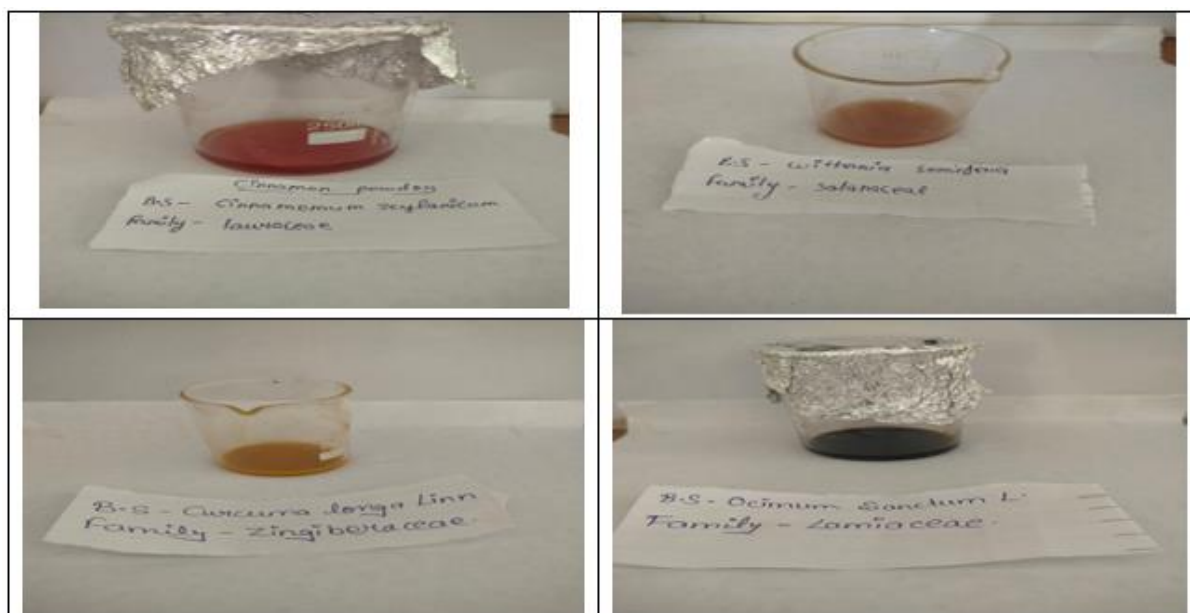


Fig 7: Extract

FORMULATION OF HERBAL FACE SCRUB

- **Herbal Extract Preparation:** Extracts of saffron, tulsi, ginger, ashwagandha, cinnamon, turmeric, and rose petals are prepared using suitable extraction methods.
- **Base Cream Preparation:** Olive oil, cetyl alcohol, methylparaben, agar, carbapol 940, stearic acid, and glycerine are mixed thoroughly in appropriate proportions to form a base cream.
- **Herbal Extract Incorporation:** The prepared herbal extracts are added to the base cream mixture and stirred until homogeneity is achieved.
- **Final Adjustments:** Distilled water is added gradually to attain the desired consistency. Vanilla essence is added for fragrance.
- **Homogenization:** The mixture is homogenized to ensure uniform distribution of ingredients.
- **Quality Control:** The cream is subjected to quality control tests including pH measurement, viscosity assessment, stability testing, and microbial analysis.
- **Packaging:** The final cream is packaged in suitable containers under sterile conditions to maintain its quality.
- **Evaluation:** The formulated cream is evaluated for its anti-aging properties.

Procedure

Carbopol 980 and Agar were dissolved in water to create a liquid dispersion with slight swelling. Saffron extract and other active pharmaceutical ingredients (APIs) were added to this dispersion. In a separate container, the oil phase consisting of Cetyl alcohol, Olive oil, Glycerol monostearate, and Stearic acid was melted using a heating mantle. The liquid dispersion (water phase) was then added to the oil phase mixture. Methylparaben was incorporated into the mixture, followed by trituration of all ingredients for 30 minutes. This process resulted in the formation of a polyherbal anti-aging cream.

EVALUATION PARAMETERS

- **Visual Evaluation:** The prepared formulations were assessed for their physical characteristics including appearance, color, scent, and consistency.
- **pH Measurement:** The pH meter underwent calibration using a standard buffer solution. A sample of 0.5g of cream was dissolved in 50.0 ml of distilled water, and its pH level was determined using pH paper.
- **Spreadability Assessment:** The ability of the system to spread evenly on the skin surface was evaluated, ensuring optimal absorption for an effective healing response.
- **Washability Test:** Removal of the applied cream from the skin was conducted by gentle washing under tap water, ensuring minimal force to effectively cleanse the skin.
- **Irritation Study:** Examination of the cream revealed no signs of redness, irritation, swelling, or inflammation during irritation tests, indicating their safety for skin application [22].

RESULTS

The herbal antiaging cream was prepared and evaluated.

Table 1: Composition of Herbal Anti-aging Face Cream

Composition	Quantity for 100 gm (in%)
Saffron	2.5 %
Tulsi	2.5 %
Ginger	2.5 %
Ashwagandha	2.5 %
Cinnamon	2.5 %
Turmeric	2.5 %
Rose Petals	2.5 %
Olive oil	10 %
Cetyl Alcohol	3 %
Methyl paraben	2 %
Agar	3 %
Carbopol 940	5 %
Stearic acid	6 %
Glycerine	2 %
Distilled water	Qs
Vanilla essence	1.5%



Fig 8: Formulated Herbal Anti-aging Face Cream

The herbal antiaging cream formulated in the laboratory was found to be compared with various parameters such as appearance, pH, and spreadability, washability, irritability and

found to be satisfied with all required characterization. Thus, the developed formulation can be used as an effective cosmetic formulation for using it to bear a healthy and glowing skin.

Table 2: Result of evaluation parameter of Herbal Aloe-Vera Skin Gel

SR.NO.	PARAMETERS	OBSERVATIONS
1.	Colour	Dost Beige
2.	Odour	Chocolatey
3.	Consistency	Good
4.	pH	6
5.	Spreadability	10.23 g.cm/sec
6.	Homogeneity	Good
7.	Irritability	Non-irritant
8.	Washability	Easily washable

Irritation Test:

Test	Duration (Minute)	Results
T1	30	No
T2	30	No
T3	30	No
T4	30	No

CONCLUSION

The formulation and evaluation of the polyherbal anti-aging face cream yielded promising results. Through meticulous assessment of visual appearance, pH levels, spreadability, washability, and irritation potential, it was determined that the cream exhibited desirable characteristics suitable for skincare applications. The absence of adverse reactions in irritation tests further confirmed the safety and efficacy of the formulated cream. Overall, these findings suggest that the developed polyherbal cream holds the potential as a viable solution for addressing the signs of aging while ensuring skin safety and comfort. Further studies and clinical trials may be warranted to explore its long-term effects and broader applicability in skincare regimens.

Conflict of Interest: None

Funding: This project is supported by Lucknow Model College of Pharmacy, Lucknow.

Acknowledgment: The author would like to thank Dr. Amit Singh (Vice-Chairmen, Lucknow Model group of colleges) and all their mentors. The notes compiled here are collected over a period of time and may have been reproduced verbatim. Apologize to all researchers if in-advertently failed to acknowledge them in the references.

REFERENCES

1. Hannah M. A brief history of Anti -Aging. <https://www.harpersbazaar.com/beauty/skin-care/a14980/history-of-anti-aging>. Vol 14; 2016. (Accessed Date; 02/03/2024).
2. Retrieved from Alfaro Danilo, what are herbs;2022. <http://www.thesproceeat.com>. (Accessed Date; 02/03/2024).
3. Surya MP, Santhos MA, Gulshanm MD, Raghavamma STV, Nadendla, Rao R. Formulation and evaluation of antiaging poly Herbal Cream Int. *J PharmSci Rev Res*, 24(2). January-February 2014;22:133-136.
4. Shahzad A, MD, Syarhabil A, MD, Salam Faridah N. Review on polyherbal formulation. *Syst Rev Pharm*. 2016;7(1):35-34.
5. Sumit K, Sujata S, Ashish B, Vivek S. *Herbal Cosmetics: Used for Skin*; May 2014.
6. Davkhar, Somnath S, Bhandari, Aarti S, Sanjivani AA. *Multipurpose Herbal Cream*; 2023.
7. Nishino Ko I, Nayar SK. The appearance of humans. *Skin*. 2007.
8. Reviewed by a Cleveland Clinic medical professional article. Accessed 7/27/2022. <https://my.clevelandclinic.org/health/articles/10984-wrinkles>
9. Saul L, Nussbaum C. *Martha Reflection on Wrinkles*. Vol 18; 2023.
10. Limin G, Peisen WP, Zheng S, Qu Z. *The Review of Antiaging Mechanism*; 2021.
11. Jon J. What are the health benefits of saffron? <https://www.medicalnewstoday.com/articles/327017>; 2019.
12. Rodrigues F, Pimentel FB, Oliveira MBPP. Olive by-products: challenge application in the cosmetic industry. *Industrial Crops and Products*. 2015;70:116-124. doi:10.1016/j.indcrop.2015.03.027
13. Puja Saha, Supriyo D. *Anupam Saha Tulsi as an Active Ingredient with Antimicrobial Activity*; 2021.
14. Mehtap O, Necla B, Işıl Takan. *Vasileiou Christina, Ginger for Healthy Ageing 2022*.
15. *Daniells Stephen, Ashwagandha Root Extracts Show Antiaging Effects*; 2016.
16. Narendra S, Mohit B, de Prashant J. *An Overview on Ashwagandha, 2011*.
17. Allison A. *Cinnamon Can Help Lower Blood Sugar*; 2013.
18. <https://balconygardenweb.com/growing-turmeric-in-pots-how-to-grow-turmeric-care-uses-benefits/>.
19. Young SR, Won LC, Ahram H, Myung LH. *Rose Petal Extract Exerts Skin Whitening and Antiwrinkle Effects*; 2020.
20. Radix R, Muhammad R, Nunung Y. *Extraction of Saffron*; 2020.
21. Antonio M, Jose LS A. *Maceration and Fermentation*; 2019.
22. Yadav Aman MKD, Pritesh P, Nadeem F. *Formulation and Evaluation of Antiaging Cream*; 2021.