



Formulation and Evaluation of a Polyherbal Face Oil

Author(s): Vaishnavi M. Kadam¹, Apeksha S. Gholap², Mayur T. Gaikar³

Affiliations:

⁴Pravara Rural Education Society's College Of Pharmacy (For Women) , Chincholi, Nashik, 422102, Maharashtra, India.

⁵Assistant professor, Department of Pharmacology, Pravara Rural Education Society, College of Pharmacy for Women, Chincholi, Nashik, Maharashtra, India.

ABSTRACT

The current research centers on the creation and assessment of a herbal facial oil that includes natural components like tea tree oil, jojoba oil, kumkumadi oil, rosehip oil, and almond oil. This study aimed to create a formulation that is safe, effective, and gentle on the skin, offering moisturizing, antimicrobial, and rejuvenating properties. The chosen oils were selected for their therapeutic effects, where almond oil and jojoba oil function as carrier oils that deliver profound nourishment, tea tree oil supplies antimicrobial benefits, and kumkumadi oil along with rosehip oil assists in brightening and revitalizing the skin. The blending of oils was executed in appropriate ratios to achieve a uniform mixture. The resulting herbal oil underwent various assessments, encompassing sensory properties (color, scent, and feel), pH, density, and irritation analysis. The outcomes demonstrated that the formulation had a delightful fragrance, a silky feel, and an acceptable appearance. The pH level was determined to be within the appropriate range for skin application, while the density confirmed a consistent formulation. The irritation analysis revealed no redness or irritation, suggesting that the product is safe for dermal use.

KEYWORDS: Herbal facial oil, Tea tree oil, Jojoba oil, Kumkumadi oil, Rosehip oil, Almond oil, Formulation, Evaluation, Physicochemical properties, Irritation analysis, Natural skincare, Antimicrobial properties, Skin revitalization.

Introduction :

Herbal cosmetics are made using approved cosmetic bases and include one or more herbal ingredients to create specific beauty benefits. These are called herbal cosmetics. Plant extracts are commonly used in beauty products because they have helpful properties like antioxidant, anti-inflammatory, antiseptic, and antimicrobial effects. A serum is a thick solution often used in skincare. Whether it's water-based or oil-based, a serum is just as effective as a cream and can quickly and efficiently help with skin problems. For a skincare product to work well, it needs to deliver the active ingredients deep into the skin. An herbal anti-ageing face serum is made without harmful synthetic chemicals or additives that might irritate the skin. By combining traditional herbal remedies with modern scientific techniques, these serums offer a gentle yet effective way to help maintain youthful, healthy skin. Cosmetic preparations are made when beauty products are mixed with medicines. Cosmetics are products used on the outside of the body, such as creams, lotions, and oils on skin, hair, and nails. They also include massage oils, smoothing creams, and antimicrobial oils. Face serums come in both water and oil forms and usually contain ten times more active ingredients than regular creams. Because of their small molecules, face serums absorb quickly into the skin, helping people see noticeable results in about a month by just using a few drops each day. These serums often contain important nutrients and active ingredients like ceramides, amino acids, antioxidants, and other key substances. Some common ingredients include liquorice extract, manjistha extract, carrot seed oil, flaxseed gel, aloe vera gel, almond oil, glycerin, and salicylic acid as a preservative.[4]

Types of Serum:

1. OIL SERUM:

An oil serum represents the most basic type of face serum, utilizing a carrier oil as its foundation, which is absorbed by the skin, particularly beneficial for dry skin. High-quality oils have been incorporated to enhance the moisturizing benefits of the oil serum. [5]

2. GEL SERUM:

The gel serum provides a firming effect on the areas of skin where it is applied. To amplify the serum's effectiveness, a water-based plant extract may be incorporated into the gel serum. [6]

3. WATER-BASED SERUM:

Gel serum A is a lightweight serum that incorporates a certain amount of gum and viscosity. It is recommended to use a water-based serum beneath creams or lotions to ensure the hydrophilic plant extract remains on the skin. Water-based serums possess the optimal capacity to deeply penetrate the skin and deliver the active ingredients effectively. [7]

4. EMULSION SERUM :

Gel serum A is a lightweight serum that incorporates a certain amount of gum and viscosity. It is recommended to use a water-based serum beneath creams or lotions to ensure the hydrophilic plant extract remains on the skin. Water-based serums possess the optimal capacity to deeply penetrate the skin and deliver the active ingredients effectively.. [8]

- **Advantages**

- 1)Improves skin texture
- 2) Improve skin elasticity
- 3)Hydrates and Nourishes the skin
- 4) Helps to reduce Hyperpigmentation
- 5)This serum is absorb quickly
- 6)Soften fine line
- 7)Shields skin from sun damage
- 8)Fights free radicals [9]

- **Disadvantages**

- 1)For these people, serum may penetrate too quickly, causing irritation
- 2) The liquid or gel-like texture of a serum can be a poor match for people with chronic skin Conditions like eczema or rosacea, which weaken the skin barrier [10]

- **MATERIALS AND METHODS**

1)METHODOLOGY**1) Cleaning & Preparation**

- Wash and dry all glassware.
- Sanitize equipment with alcohol.

2) Measurement of Oils

- Precisely measure all oils utilizing a measuring cylinder or pipette.

3) Mixing

- Combine jojoba oil and almond oil in a clean beaker (base oils).
- Gradually add rosehip oil and kumkumadi oil while continuously stirring.

4) Addition of Active Ingredient

- Introduce tea tree oil dropwise (avoid excess to prevent irritation).

5) Addition of Antioxidant

- Incorporate Vitamin E oil to enhance shelf life.

6) Homogenization

- Stir continuously for 10–15 minutes until a uniform mixture is achieved.

7) Filling

- Pour the serum into a sterile amber glass bottle using a funnel.. [11]

2) MATERIALS USED

1) JOJOBA OIL

Scientific Name: Simmondsia chinensis

Family: Simmondsiaceae

Source

- Made from seeds of the jojoba plant.
- Native to desert regions (USA, Mexico)

Chemical Nature

It's not really an oil, but instead it's a type of liquid wax ester.

- Closely resembles human sebum (skin oil)

Phytoconstituents

- Wax esters (main component)
- Fatty acids:
 - Eicosenoic acid
 - Oleic acid
- Fatty alcohols
- Vitamin E (tocopherols) [12]



2)ALMOND OIL

Scientific Name: *Prunus amygdalus* (also called *Prunus dulcis*)

Family: Rosaceae

Source

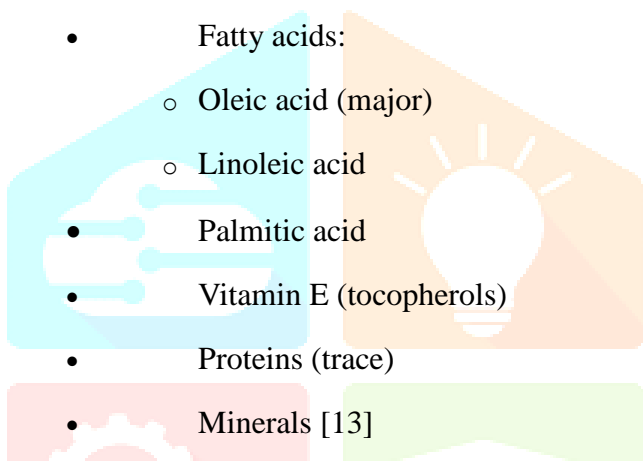
- Obtained from the seeds (kernels) of the almond fruit
- Two types:
 - Sweet almond oil (used in cosmetics & medicine)
 - Bitter almond oil (used in flavouring; contains toxic compounds)

Chemical Nature

- Fixed oil (triglycerides of fatty acids)

Phytoconstituents

- Fatty acids:
 - Oleic acid (major)
 - Linoleic acid
- Palmitic acid
- Vitamin E (tocopherols)
- Proteins (trace)
- Minerals [13]



3)ROSEHIP OIL

1. Scientific Name: *Rosa canina* ,*Rosa rubiginosa*

2. Source

- Obtained from the seeds of the fruit (rosehip) of the rose plant
- Family: Rosaceae

3. Nature

- Fixed oil (non-volatile oil)
- Light, non-greasy
- Pale yellow to reddish-orange in color

4. Phytoconstituents

- Fatty acids
 - Linoleic acid (Omega-6)
 - Linolenic acid (Omega-3)
 - Oleic acid
- Vitamins
 - Vitamin A (retinoids)
 - Vitamin C
 - Vitamin E [14]



4) KUMKUMADI OIL

1. Scientific Name (Main Ingredient): Saffron: *Crocus sativus*

2. Source

- Prepared from saffron (Kumkuma) along with other herbal ingredients processed in a base oil (usually sesame oil – *Sesamum indicum*)
- Classical Ayurvedic formulation

3. Nature

- Herbal medicated oil (polyherbal oil)
- Fixed oil
- Orange to reddish in colour
- Aromatic in odour

4. Major Ingredients (Commonly used herbs)

- Saffron (*Crocus sativus*)
- Sandalwood (*Santalum album*)
- Manjistha (*Rubia cordifolia*)
- Licorice (*Glycyrrhiza glabra*)
- Lotus (*Nelumbo nucifera*)
- Sesame oil (*Sesamum indicum*) – base oil

5. Phytoconstituents

- Crocin, Safranal (from saffron)
- Santalol (from sandalwood)
- Glycyrrhizin (from licorice)
- Anthraquinones (from manjistha)
- Fatty acids (from sesame oil)
- Flavonoids and antioxidants [15]



5) TEA TREE

1. **Scientific Name:** *Melaleuca alternifolia*

2. **Source**

Obtained from the fresh leaves and twigs of *Melaleuca alternifolia*

Family: Myrtaceae

3. **Nature**

- Volatile oil (essential oil)
- Colorless to pale yellow
- Strong, characteristic medicinal odor

4. Method of Extraction

- Steam distillation

5. Phytoconstituents

- Terpinen-4-ol (major active component)
- α -terpineol
- γ -terpinene
- 1,8-cineole
- Terpenes [16]



PRELIMINARY TEST

1) KUMKUMADI OIL

Phytoconstituent: Crocin, Safranal

1. Test for Glycosides (Crocin) – Molisch Test

- Procedure:

Sample + α -naphthol + conc. H_2SO_4

- Observation:

Formation of violet ring

- Inference: Presence of glycosides (crocin)[17]



2. Test for Carotenoids (Crocin) – Colour Test

- Procedure:
Dissolve sample in suitable solvent
- Observation:
Yellow to orange color
- Inference:
Presence of carotenoids (crocin) [18]



3. Test for Terpenoids – Salkowski Test

- Procedure:
Sample + chloroform + conc. H_2SO_4
- Observation:
Reddish-brown color at interface
- Inference:
Presence of terpenoids (related to safranal) [19]



2) ROSEHIP OIL

Phytoconstituents

Fatty acids like linoleic acid, linolenic acid, and oleic acid.

- Phytosterols

- Carotenoids
- Vitamin C
- Flavonoids

1) Test for Flavonoids

- Procedure:

Sample + conc. H_2SO_4

- Observation:

Formation of deep yellow color

- Inference:

- Presence of flavonoids[20]



3) JOJOBA OIL

Phytoconstituents

- Wax esters (major component)
- Fatty acids
- Fatty alcohols
- Minor hydrocarbons

1. Test for Fatty Acids – Solubility Test

- Procedure:

Sample mixed with water or diluted sulfuric acid (H_2SO_4).

(b) Sample mixed with organic solvent like ether or chloroform.

- Observation:

(a) Insoluble in water / acid

(b) Soluble in ether or chloroform

• Inference:

Presence of fatty acids (lipid nature)



Fig: insoluble in water



Fig: soluble in chloroform

2. Test for Wax Esters – Saponification Test

- Procedure:
Sample + alcoholic KOH or NaOH, heat
- Observation:
Formation of soap (saponification occurs)
- Inference:
Presence of wax esters [21]



4) TEATREE OIL

Phytoconstituents

- Terpenes
 - Terpinen-4-ol (major)
 - α -terpineol
 - γ -terpinene
 - 1,8-cineole

1) Test for Terpenes – Salkowski Test

- Procedure:
Sample + chloroform + conc. H_2SO_4
- Observation:
Formation of reddish-brown color at the interface
- Inference:
Presence of terpenes [22]



5) ALMOND OIL

Phytoconstituents

- Oleic acid (major)
- Palmitic acid
- Phytosterols

1. Test for Phytosterols – Salkowski Test

- Procedure:
2 ml sample plus 2 ml chloroform plus 2 ml conc. H_2SO_4 , shake
- Observation:

The chloroform layer looks red, and the acid layer has a greenish yellow glow under light.

- Inference:

- Presence of phytosterols[23]



2. Test for Oleic Acid (Unsaturation) – Bromine Test

- Procedure:
Sample + bromine solution
- Observation:
Decolourization of bromine (reddish-brown colour disappears)
- Inference:
Presence of unsaturated fatty acids (oleic acid) [24]



3. Test for Unsaturation – Baeyer's Test

- Procedure:
Sample + KMnO_4 solution
- Observation:
The purple color fades away and a brown solid called manganese dioxide (MnO_2) appears.

- Inference:
 - Presence of unsaturated fatty acids [25]



FORMULATION TABLE

Sr.no	Ingredients	Quantity(ml)	Category/Function
1)	Jobaba Oil	8ml	Moisturiser, carrier oil
2)	Almond Oil	8ml	Nourishing agent, emollient
3)	Rosehip Oil	6ml	Skin regeneration, antioxidant
4)	Kumkumadi oil	6ml	Skin brightening, rejuvenating
5)	Tea Tree Oil	2ml	Antimicrobial, anti-acne

PROCEDURE



- 1. Cleaning of apparatus
 - Use clean and dry glass items like a beaker, measuring cylinder, and glass rod.
2. Preparation of base
- In a clean beaker, add:
 - Almond oil – 11 ml
 - Jojoba oil – 6 ml
- Stir slowly to create a smooth and even mixture.
3. Addition of herbal oils
- Add Rosehip oil – 6 ml, mix it in slowly while stirring continuously.
- Then add 6 ml of Kumkumadi oil and mix it well..



4. Addition of essential oil

- Add tea tree oil – 1 ml, drop by drop.

Stir the mixture constantly for 5 to 10 minutes so everything blends evenly.

5. Filtration (if required)

Filter the mixture through a piece of muslin cloth or filter paper.

6. Filling and labelling

- Transfer the prepared oil into an amber-colored bottle
- Label with name, date, and formulation number.

7. Storage

- Store in a cool, dry place away from light [26]

EVALUATION

- 1. pH
- The best range is 4.5 to 6.5, which is near the pH of the skin.

• Importance:

Maintains skin barrier

Prevents irritation

Ensures compatibility with skin

- Method: The pH was measured using a digital pH meter.. [27]



2. Density

- Density refers to how much mass is contained in a certain amount of serum.

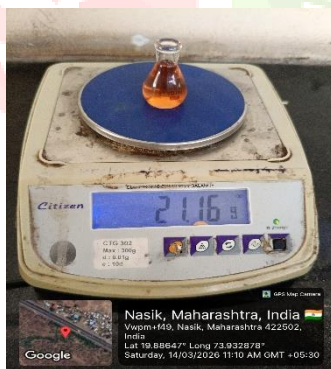
- Unit: g/mL

- Importance:

Indicates consistency and thickness

Helps in uniform application

- Typical range is about 0.8 to 1.0 grams per milliliter, which can vary based on the type of oils used.
- Method: The measurement is done using a pycnometer or a density bottle. [28]



3. Irritability Test

- Definition: Checks if the serum makes the skin feel irritated.

- Method:

Apply a small amount to the skin and do a patch test.

Check for any redness, itching, or swelling for 24 hours.

- Result Interpretation:

o No reaction → Non-irritant

o Redness/itching → Irritant [29]



4. Physical Evaluation: The color and look of the formulation were checked by looking at it with the eyes. The formulation procedure uniform Distribution of extracts. This test was checked by looking at it and by feeling it. [30]



EVALUATION TABLE

Sr.no	Property	Description
1)	pH	6.14
2)	Density	2.409
3)	Colour	Pale yellow
4)	odour	Pleasant, characteristic aroma
5)	texture	Smooth, non-greasy
6)	Appearance	Clear
7)	Irritability	Non-irritant

CONCLUSION

The current research successfully developed and assessed a 30 ml herbal face oil that includes Kumkumadi oil, clove oil, almond oil, jojoba oil, and tea tree oil, with the objective of improving skin health through a natural and synergistic method. Each component was chosen for its well-established pharmacological and cosmetic benefits, which enhance the overall efficacy of the formulation. Kumkumadi oil served as the primary active ingredient, recognized for its ability to enhance skin complexion and diminish pigmentation. Almond oil and jojoba oil offered excellent emollient and moisturizing qualities, aiding in the maintenance of skin hydration and softness without

obstructing pores. Tea tree oil provided antimicrobial and anti-acne properties, while clove oil enriched the formulation with its antioxidant and mild antiseptic characteristics. The evaluation criteria, which included pH, density, irritability, and organoleptic features, demonstrated that the formulation is stable, skin-friendly, and appropriate for topical use. The oil displayed acceptable sensory attributes such as a pleasant fragrance, smooth texture, and good spreadability, all of which are crucial for user adherence. No significant irritation was noted, indicating that the formulation is safe for regular application when used correctly. In summary, the created herbal face oil shows considerable promise as a natural skincare solution for enhancing skin tone, hydration, and defense against microbial infections. It presents a safe and effective alternative to synthetic products. Nevertheless, additional research, including long-term stability assessments and clinical trials on a larger demographic, is advised to confirm its effectiveness and commercial viability.

References

- [1] B. M. P. M. B. R. M. G. A. U. P. Arsha S A1, "Formulation And Evaluation Of Herbal Face," *International Journal of Novel and Research*, vol. 9, no. 8 August 2024, pp. 2456-4184, 2024.
- [2] p. j. P. p. R. M. K. Gayatri Vikram Salunke*, "Formulation and Evaluation of Herbal Face Serum," *International Journal of Creative Research Thoughts*, vol. 12, no. 6, June, pp. 2320-2882, 2024.
- [3] R. K. S. a. P. S. Sreya T. C., "REVIEW ARTICLE ON: HERBAL ANTI-AGING FACE SERUM," *World Journal of Pharmacy and Pharmaceutical Science*, vol. 13, no. 6, pp. 57-67.
- [4] Z. Draelos, "Cosmeceuticals: What is real, what is not," *Dermatologic Clinics*, vol. 31(1), pp. 1-9, 2013.
- [5] B. M. P. M. B. R. M. G. A. U. P. Arsha S A1, "Formulation And Evaluation Of Herbal Face," *International Journal of Novel Research and Development*.
- [6] J. P. B. & S. C. Patel, "Formulation and Evaluation of Herbal Gel Containing Plant Extracts," *International Journal of Pharmaceutical Sciences Review and Research*, vol. 13, no. 2.
- [7] A. M. A. K. & S. A. Gupta, "Formulation and Evaluation of Herbal Gel for Topical Application," *International Journal of Pharmaceutical Sciences and Research*, vol. 5, no. 5, pp. 2000-2005, 2014.
- [8] M. J. & R. G. D. Lawrence, "Formulation and Stability of Emulsions for Topical Delivery," *Advanced Drug Delivery Reviews*, p. 5, 2012.
- [9] L. Baumann, "Skin Ageing and Its Treatment," *Journal of Pathology*, 2012.
- [10] M. Loden, "Role of Topical Emollients and Moisturisers in the Treatment of Dry Skin Barrier Disorders," *American Journal of Clinical Dermatology*, 2003.
- [11] A. O. P. M. & M. H. I. Barel, *Handbook of Cosmetic Science and Technology*, vol. 3, 2009.
- [12] R. R. A.-N. A. B. K. A. E. & A.-A. M. M. Habashy, "Anti-inflammatory effects of jojoba liquid wax in experimental models," *Pharmacological Research*, vol. 51, 2005.
- [13] H. & S. F. Miraliakbari, "Antioxidant activity of minor components of tree nut oils," *Food*

- Chemistry*, vol. 111, 2008.
- [14] C. R. B. D. M.-L. U. & C. S. Chrubasik, "A systematic review on the Rosa canina effect and efficacy profiles," *Phytotherapy Research*, vol. 22, no. 6, 2008.
- [15] B. & S. V. J. Ravishankar, "Indian Systems of Medicine: A Brief Profile," *African Journal of Traditional, Complementary and Alternative Medicines*, vol. 4, 2007.
- [16] B. A.-W. N. A. S. S. e. a. Ali, "Essential oils used in aromatherapy: A systematic review," *Asian Pacific Journal of Tropical Biomedicine*, vol. 5, 2015.
- [17] J. B. Harborne, "Phytochemical Methods: A Guide to Modern Techniques of Plant Analysis," *Springer*, vol. 3, 1998.
- [18] R. A. H. D. R. K. e. a. Srivastava, "Crocic, Safranal and Picrocrocic: Chemical and pharmacological aspects of saffron," *Pharmacognosy Reviews*, vol. 4, no. 8, 2010.
- [19] R. A. H. D. R. K. e. a. Srivastava, "Crocic, Safranal and Picrocrocic: Chemical and pharmacological aspects of saffron," *2010*, vol. 4, no. 8.
- [20] K. R. Khandelwal, *Practical Pharmacognosy: Techniques and Experiments*, 2018.
- [21] J. B. Harborne, "Phytochemical Methods: A Guide to Modern Techniques of Plant Analysis," *Springer*, vol. 3, 1998.
- [22] K. R. Khandelwal, "Practical Pharmacognosy: Techniques and Experiments," *Nirali Prakashan*, 2018.
- [23] J. B. Harborne, "Phytochemical Methods: A Guide to Modern Techniques of Plant Analysis," *Springer*, 1998.
- [24] K. R. Khandelwal, "Practical Pharmacognosy: Techniques and Experiments," *Nirali Prakashan*, 2008.
- [25] K. R. Khandelwal, *Practical Pharmacognosy: Techniques and Experiments*, 2008, p. 149–150.
- [26] A. O. P. M. & M. H. I. Barel, *Handbook of Cosmetic Science and Technology*, 3 ed., 2009.
- [27] p. j. P. p. R. M. K. Gayatri Vikram Salunke*, "Formulation and Evaluation of Herbal Face Serum," *International Journal of Creative Research Thoughts*, vol. 12, no. 6 june, 2024.
- [28] T. Tadros, "Emulsion Formation and Stability," *Wiley-VCH*, 2013.
- [29] p. j. P. p. R. M. K. Gayatri Vikram Salunke*, "Formulation and Evaluation of Herbal Face Serum," *International Journal of Creative Thoughts and Research*, vol. 12, no. 6 june, 2024.
- [30] A. S. S. M. K. S. Prerana Nagare1*, "DEVELOPMENT AND EVALUATION OF A POLYHERBAL FACIAL," *World Journal of Pharmaceutical Research*, vol. 15, no. 4, pp. 681-697.