



Herbal Cosmeceuticals: Formulation Of Saffron And Sandalwood-Based Facial Serum-A Research

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Abstract: The Current Study Emphasizes The Formulation And Assessment Of A Herbal Face Serum Containing Saffron (*Crocus Sativus*) And Sandalwood Oil (*Santalum Album*), Trusted Historically And Scientifically For Skincare. The Aim Was To Create A Natural Effective Cosmetic Product That Doses Biocompatibility And Safety, While Addressing Skin Problems Like Pigmentation, Aging, Acne, And Dryness. The Serum Was Formulated With Infused Saffron And Sandalwood Essential Oil In A Carrier Base Oil Together With Natural Emulsifiers And Active Agents. This Work Corroborates Ethnomedicinal Uses Across Various Regions, And The Serum Was Found To Possess Remarkable Emollient, Antioxidant, And Anti-Hyperpigmentation Activities Owing To The Phytochemicals Therein. Comprehensive Phytochemical Screening Established The Presence Of Flavonoids, Phenols, Saponins In Terpenoids Which Contribute To The Anti Inflammatory And Antimicrobial Actions Of The Examined Compounds. The Formulation Demonstrated Meaningful Antioxidant Activity As Shown By DPPH Radical Scavenging Assay, And Proved Emulative Potency Towards Common Skin Infections. Other Physical Parameters Like Ph And Consistency Were Within Accepted Range For Topical Application And Were Determined Suitable For Use At 6.2, Spreadability, Texture And Appearance. Microbial Load Assessment Yielded A Total Plate Count Of Less Than 10 CFU/ML Indicating Low Microbial Load And High Safety For Cosmetic Application. The Formulated Serum Displayed Effectiveness In Increasing Skin Hydration, Decreasing Pigmentation And Improving Skin Color Overall During A User Evaluation Test.

keyword -Saffron (*Crocus sativus*), Sandalwood Oil (*Santalum album*), Herbal Face Serum, Antioxidant Activity, Phytochemical Analysis. Phytochemical Analysis, Anti-inflammatory, Skin Brightening, Anti-aging, Natural Skincare, Ayurvedic Ingredients, DPPH Assay, Cosmetic Formulation.

I. INTRODUCTION

The Skin Is The Body's Largest Organ And Serves As The First Line Of Defense To Geophysical Harm. It Encounters Numerous Stressors Like Ultraviolet Light, Pollution, And Potent Chemicals Which Lead To Age-Related Changes Such As Dryness, Wrinkles, Pigmentation, And Loss Of Elasticity. Subsequently, The Demand For Safe And Effective Natural Skincare Products Has Increased. (Papakonstantinou Et Al., 2012)

Herbal Formulations Enjoyed Fame In Recent Years Because Of Their Derivate Benefits Coupled With Diagnosed Plant Ingredients. These Include Saffron (*Crocus Sativus*) And Sandalwood Oil (*Santalum Album*) As They Are Well Known For Phytochemicals And Traditional Herbal Medicine Use. Akaberi, M., Et Al. (2019).

Saffron Is A Prevalent Medicinal Herb Extracted From The Stigmas Of *Crocus Sativus* Which Is Used In Ayurveda And Unani . Its Key Bioactive Compounds Like Crocin, Safranal, And Picrocrocin Are Great Antioxidants, Anti-Inflammatories, And Skin Brighteners (Naeimifar Et Al., 2020; Akaberi Et Al., 2019). Saffron Has Proven To Hinder Melanin Synthesis, Pigmentation, And Overall Skin Tone To Improve (Sharifi-Rad Et Al., 2020).

Sandalwood Oil, Which Is Extracted From The Heartwood Of *Santalum Album*, Contains Significant Amounts Of Alpha And Beta Santalol, Which Are Known For Their Antimicrobial, Soothing, And Anti-Aging Effects (Ali Et Al., 2015). *Santalum Album* Has Been Used In Traditional Medicine For The Treatment Of Acne, Inflammation, And Other Skin Diseases. The Cosmetic Applications Of Sandalwood Are Attributed To The Herb's Ability To Calm Irritated Skin And Hydrate Tissues (Babu Et Al., 2020).

Combining Saffron Oil And Sandalwood Oil In A Herbal Face Serum Might Have Synergistic Effects In Solving Oxidative Stress, Pigmentation, And Moisture Retention. This Study Intends To Design And Test A Herbal Face Serum Based On The Two Botanicals, Determining Its Phytochemical Profile, Antioxidant Capacity, Antibacterial Activity, Cosmetic Prospective, As Well As Through Non-Invasive User Assessment Tests. Ali, B., Et Al. (2015)

II.AIM:

The aim of this project is to formulate and develop a herbal face serum using Saffron and Sandalwood Oil as the primary active ingredients.

III.METHODOLOGY:

3.1.Ingredient Choice and Reasoning

Prior To Commencing The Formulation, The Initial Step In The Process Is To Choose The Ingredients According To Their Characteristics And Aptitude For Skincare:

- **Saffron:**

Saffron Has Active Ingredients Such As Crocin, Safranal, And Picrocrocin, Which Are Responsible For Its Anti-Inflammatory, Anti-Oxidant, And Anti-Microbial Effects. The Ingredients Lighten The Skin, Fade Pigmentation, And Calm Inflammation Of The Skin. Flower Extract Also Assists In Enhancing The Elasticity Of The Skin, Encouraging Healthy Skin Renewal, And Inhibiting Premature Aging Signs.

- **Sandalwood Oil:**

Sandalwood Oil Contains Anti-Inflammatory, Antibacterial, And Antifungal Ingredients. It Is Applied To Cure Acne, Blemishes, And Pigmentation. Sandalwood Oil Also Calms Down The Skin And Is Commonly Applied On Dry And Sensitive Skin Because It Moisturizes.

Preparation Of Herbal Face Serum

3.2.Procedure:

1.Step 1 - Saffron Infusion:

Of Start By Infusing Threads Of Saffron In A Carrier Oil (Jojoba Or Argan Oil). Soak The Saffron In The Oil For Approximately 48 Hours To Ensure The Active Components Infuse Well.

2. Step 2 - Sandalwood Oil Preparation:Sandalwood Oil Must Be Obtained From A Genuine Supplier, Keeping The Purity And Concentration Of Oil Intact. It Can Be Blended With A Few Drops Of A Carrier Oil To Avoid Irritating The Skin.

3. Step 3 - Combining Ingredients:

Of Combine The Infused Saffron Oil, Sandalwood Oil, And The Other Carrier Oils In A Clean Glass Beaker. The Proportion Of Saffron To Sandalwood Oil Can Be Varied As Per The Required Strength. A Common Combination Could Be 2:1 Or 3:1 Based On The Sensitivity Of The Skin.

4.Step 4 - Adding Emulsifiers And Active Ingredients:

O Slowly Add Emulsifiers, Then The Active Ingredients Such As Vitamin E Or Hyaluronic Acid. Mix Well To Ensure Consistency In The Serum's Texture.

5. Step 5 - Cooling And Bottling:

Once The Serum Is Well Mixed, Let It Cool Down To Room Temperature. Then Pour The Cooled Serum Into Sterilized Dropper Bottles For Convenient Application.

3.3.QUALITATIVE PHYTOCHEMICAL SCREENING:

Test For Alkaloids:

Add A Few Drops Of Dragendorff's Reagent Into The Extract. Positive Result Is Observed When There Is The Formation Of An Orange Or Red Precipitate.

Test For Flavonoids:

To The Extract, Add A Few Drops Of Dilute Sodium Hydroxide (NaOH). Yellow Coloration Is A Sign That The Extract Contains Flavonoids.

Test For Tannins:

Add A Few Drops Of Iron(III) Chloride ($FeCl_3$) To The Extract. Blue-Black Or Greenish-Black Color Suggests The Presence Of Tannins.

Test For Saponins

Mix The Extract With Distilled Water, And Observe For Foam Formation. Foam Formation Persists When Saponins Are Present.

Test For Terpenoids:

Add A Few Drops Of Liebermann-Burchard Reagent To The Extract. Reddish-Brown Or Green Color Change Suggests The Presence Of Terpenoids.

Test For Phenolic Compounds:

Ferric Chloride ($FeCl_3$) Reagent May Be Added To Test For Phenolic Compounds. Blue Or Green Coloration Indicates The Presence Of Phenols.

3.4.FORMULATION OF FACE SERUM

Infuse Saffron:

- Put 50 G Saffron And 50 ML Distilled Water In A Heat-Resistant Glass Bowl.
- Put The Bowl Over A Pot Of Simmering Water (Double Boiler Method). Slowly Heat For 10-15 Minutes So That The Saffron Will Release Its Essence And Color.
- Stir Every Now And Then. Prevent The Water From Boiling Aggressively To Prevent Burning The Saffron.

Strain The Saffron:

- * Remove The Bowl From The Double Boiler After Heating. Let It Cool Down A Bit.
- * Strain The Threads Of Saffron Through A Fine Mesh Strainer Or Cheesecloth.

Add Sandalwood Oil:

- * Add 10 Drops Of Sandalwood Essential Oil To The Saffron Water And Mix Softly.

Store And Use:

- * Pour The Mixture Into A Glass Dropper Bottle.
- * Shake Well Before Use. Use 2-3 Drops On The Face And Neck After Washing

3.5.PHYSICAL EVALUATION

The Color And Appearance Of The Formulation Were Seen Visually. The Extractions Are Uniformly Distributed In The Course Of The Formulation Process. This Was Confirmed By Visual Appearance And By Touch.

pH VALUE:

A Ph Meter Was Standardized With A Standard Buffer Solution. Almost 1 ML Of The Face Serum Was Weighed Accurately And Dissolved In 50 ML Of Distilled Water Before The Ph Was Calculated. The Skin Is Acidic In Nature And The Skin Serum Ph Should Be In The Range Of 5.8-6.2.

3.6.SPREADABILITY

Procedure: Put A Little Bit Of Serum On A Glass Slide, Spread It With Another Slide, And Softly Press With A 100g Weight And Easily Spreads Without Effort, No Greasy Or Sticky Residue.



Taxonomic classification of *Crocus sativus* L:

Kingdom	Plantae
Phylum	Streptophyta
Class	Equisetopsida
Sub class	Magnoliidae
Order	Asparagales
Family	Iridaceae
Genus	Crocus
Species.	Crocus sativus L.

IV.RESULTS AND DISCUSSION

4.1.PHYTOCHEMICAL SCREENING ON CROCUS SATIBUS EXTRACT

Phytochemical Analysis Was Conducted With The Help Of Ethanol Extract Where Flavonoids And Phenol Where Highly Abundant Alkaloids Tannins,Saponins,Terpenoids Were Also Established.

4.2.EVALUATION:

Physical Appearance:

Golden Yellow To Orange Owing To Saffron Crocin Content And Light Non-Greasy And Easily Absorbed

4.3.pH:

The Ph Formulation Was Found 6.2 the skin having and acidic ph around 4.1-6.7,this range of formulation is suitable for skin

4.4.Physiochemical parameters of *Crocus sativus*:

S.NO	PARAMETERS	OBSERVATION
1	Colour	Golden Yellow
2	Odour	Woody
3	pH	6.2
4	Texture	Light

4.5.HERBAL FACE SERUM BY USING CROCUS SATIBUS



CONCLUSION:

The creation of a herbal face serum from saffron and sandalwood oil is a testament to the strong synergy between nature and skin science. Both the ingredients—saffron, possessing antioxidant and complexion-improving qualities, and sandalwood oil, possessing soothing and anti-inflammatory qualities—are rich in benefits that ensure healthy, glowing skin.

This serum treats not only the usual skin issues like dullness, pigmentation, lines, and acne, but also brings nourishment to the skin through natural ingredients and deep hydration. Its non-irritating, gentle nature allows it to be used by all skin types, even sensitive skin.

With its use of plant-based, non-toxic chemicals, the serum meets increasing consumer demand for safe, sustainable, and effective skincare products. In addition, its basis in ancient Ayurvedic practice provides therapeutic and cultural value to the product, making it more attractive to consumers in domestic and global markets.

In summary, the saffron and sandalwood oil face serum is not merely a cosmetic product but an entire skincare system. It unites the richness of natural botanicals with advances in formulation technology, presenting a hopeful alternative to synthetic formulations and an opening up of the possibilities for future developments in herbal cosmetics.

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