Development and Evaluation of Polyherbal Cream

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***Abstract*—The primary goal of this study was to develop a stable, safe, and effective polyherbal cream incorporating extracts from medicinal plants (e.g., Calendula officinalis, Cinnamonium Zeylanicum, Cinnamomum Tamala) known for their therapeutic properties such as antioxidant, anti-inflammatory, antimicrobial, or anti-aging**

Since ancient times, medicinal plants have been recognized as a significant source for treating a variety of human ailments. Recently, emphasis has been placed on using environmentally and biologically friendly plant-based solutions to prevent and treat diseases. Consequently, it would be better to use safe, proven, and efficient ayurvedic herbal compositions.

Using herbal remedies to treat wounds include debridement, cleanliness, and creating an environment which is conducive to the body's natural healing process. Creams were semisolid formulations meant to be applied topically. Various herbal oils, extracts, and excipients were incorporated to formulate the cream compositions. One of the most important medical systems that cures a variety of diseases with herbal plants and extracts is Ayurveda. Polyherbal formulations are those that contain two or more herbs. Several microorganisms, including Staphylococcus aureus, Staphylococcus epidermidis, Enterococcus faecalis, Streptococcus angiosus, Bacillus subtilis, Corynebacterium spp., Escherichia coli, and others, were targeted by the antimicrobial properties of Abrus precatorius extracts from leaves, stem, and seed oil

***Index Terms*—Polyherbal cream, antioxidant, anti-inflammatory, antimicrobial, Wound healing properties.**

I. INTRODUCTION

Herbal therapy is the medicinal application of plants, plant parts, volatile oils, resins, gums, extracts, or other forms of advanced natural products prepared from plants with minimal or no industrial processing to treat or prevent disease and disease symptoms. People are becoming more interested in alternative therapies and the usage of natural plant-based products for primary health care. Because contemporary drugs are prohibitively expensive, herbal plants play an important part in the healthcare systems of a vast portion of the world's population. Herbal formulations are medical plant-derived preparations.

Present status of herbal cosmeuticals : Cosmetics demands is increasing due to the young population's desire for grooming and health. However, manufacturers face challenges in providing high-quality, environmentally friendly products. The global natural and organic personal care market is growing, with North America being the major market. Cosmeceuticals, containing naturally derived ingredients are also gaining popularity. The demand for these products is expected to grow, leading to significant international trade.

Many herbs described in Ayurveda and other traditional medicine systems have skin-beneficial properties (e.g., antioxidant, anti-inflammatory, moisturizing), which can be used to create better formulations.

The main principle of polyherbal formulations is that when several herbs are combined together, their combined effect is greater than the sum of their individual effect.

II. LITERATURE REVIEW

By considering all above parameters we have come up with an idea of Herbal Vanishing Cream containing extracted oils from the Petals of Marigold,

Bark of Cinnamon and Bay Leaf.

Herbal extracts have become a popular addition to the beauty for various body parts. These include creams, powders, soaps and solutions, which are designed to be absorbed into the skin and leave no trace behind. Vanishing creams are low-fat moisturizers that are oil in water emulsion-based preparations. Traditional remedies, often made from a mix of herbs, are becoming popular due to their safety and gentler touch compared to modern drugs. Both traditional and modern beauty products offer a unique and effective solution for various skin & hair concerns.

This herbal vanishing herbal cream consists of various crude drugs such as Extract of dried stain of cinnamon (C.Zeylaynicum,Family-Lauracea), extracts of Indian bay leaf(C.Tamala), Calendula flowers petal (Calendula officinalis, Family-Asteraceae)

Properties of Vanishing Cream:

This product is used as a skin moisturizer and cleanser on rough,dry and scaly skin.

It softens and provides a shiny texture due to antioxidant activity.

It can be used as a base before cosmetics and help blemish pimples or scars

It prevents chapping or roughening.

III. AIM AND OBJECTIVE

AIM: To formulate and evaluate a safe, stable, and effective polyherbal cream using selected medicinal plant extracts for skincare and therapeutic applications.

Objective

- To select suitable medicinal herbs based on their known pharmacological properties such as anti-inflammatory, antibacterial, antifungal, antioxidant, or wound-healing effects.
- To prepare herbal extracts from the selected plants using appropriate extraction methods.
- To formulate a polyherbal cream by incorporating the extracts into an appropriate cream base.
- To evaluate the physical parameters of the cream such as color, odor, consistency, spread ability and pH.
- To conduct skin irritation or compatibility testing to ensure the product is safe for topical application.

IV. PLAN OF WORK

- Procurement of the crude drug and other materials required for the formulation.
- Authentication of selected crude drugs by Macroscopic and Microscopic characteristics.
- Extraction of powder drugs
- Phytochemicals tests of drug
- TLC of drugs
- Compatibility Study
- Development of formulation
- Physical Evaluation
- Stability Studies
- Anti-inflammatory Study
- Moisturizing Effect Study
- Franz Diffusion Study of Formulated Gel
- Result and conclusion

Advantages of herbal cosmetic

- Herbal medicine is a renewable resource that offers long-lasting, reasonably priced medications for an expanding population. It also has a longer history of use and improves patient tolerance.
- They do not provoke allergies & don't have negative side effects. They are easily incorporated within skin and hair.
- With small quantities, they are very effective as compared to synthetic cosmetics.
- Easily available in large variety & quantity.
- Countries like India which is rich in agricultural, climatic, ethnic biodiversity there is no scarcity of herbal medicines

Disadvantages of herbal cosmetics

- Herbal drugs have slower effects and require long term therapy.
- They are difficult to hide taste and odour.
- Manufacturing processes are time-consuming and complicated.

1. *Calendula officinalis (pot marigold)*

Fig No:1 Calendula Flower

Table No: 1 Taxonomy of Calenudla Officinalis [18]

Kingdom	*Plantae*
Clade	Angiospermeae
Order	Asterids
Family	Asteraceae
Subfamily	Asteroideae
Tribe	Calenduleae
Genus	Calendula
Species	Officinalis

- Pharmacological uses of calendula officinalis

Uses	Phytoconstituents
Anti-Inflammatory and Anti- Oedematous	**Triterpenoids** Clenduloside, Calendula glycoside A and B
Anti-oxidant, Hepatoprotective,Anti-HIV	**Flavanoids** Quercetin, Isoquercetin, Rutin, Narcissn
Wound Healing, Anti-Microbial ,Anti-bacterial	**Coumarins** Scopoletin,Umbelliferone
Anti-Viral, Insecticidal	**Volatile oils** Limonene, Pinenen, Geraniol

Cinnamonium zeylanicum (Ceylon cinnamon or true cinnamon

Fig No: 2 C.zeylanicum

Table No: 3 Taxonomy of C.zeylanicum [25]

Kingdom	*Plantae*
Clade	Angiospermeae
Order	Laurales
Family	Lauraceae
Genus	Cinnamonium
Species	Zeylanicum

- Pharmacological uses of cinnamonium zeylanicum

Uses	Phytoconstituents
Anti-Oxidant,Anti-inflammatory	Cinnamaldeyhde, Eugenol
Anti-diabetic ,Anti-Cancer	Camphene, Epicatechin ,1,8 Cineole
Anti-bacterial	Cinnamic Acid
Anti-Fungal	Cymene,Carvacrol
Insecticidal, Nematicidal ,Anti-Microbial	Ethyl Cinnamate ,trans Cinnamaldehyde
Anti-Pyretic and Analgesic	A-pinene, eugenol, β-caryophyllene, and eucalyptol

Cinnamomum tamala (Bay Leaf)

Table No: 5 Taxonomy of C.Tamala [30]

Kingdom	*Plantae*
Clade	Angiospermeae
Order	Laurales
Family	Lauracae
Genus	Cinnamonium
Species	Tamala

Pharmacological uses of C.Tamala

Uses	Phytoconstituents
Anti-oxidant Anti-inflammatory	Phenols,Flavonoids, Flavanol
Anti-Convulsant Wound Healing	Eugenol, Pinene, Methyl Eugenol
Anti-bacterial ,Insect Repellent (Against Culex pipens)	1,8 Cineol
Anti-viral (Against SARS CoV ,HSV -1)	Beta-Ocimene, Alpha Pinene ,Beta Pinene

V. PREFORMULATION STUDIES

Macroscopic Studies: Plant morphology studies plant's physical form and external structure, distinct from plant anatomy, aiding in visual identification and understanding their internal structures.

- Morphological Characters
- Organoleptic Features
- Extra features

VI. PHYSICOCHEMICAL PROPERTIES

- Loss On Drying: The loss on drying is the loss of weight in percentage w/w resulting from water and volatile matter of any kind that can be driven of under specified conditions.
- Total Ash Value: Ash detection aids in identifying low-grade products, exhausted drugs, and excess of sandy or earthy matter. It's particularly useful for crude drugs mixed with mineral substances, with a maximum temp. of 450°C.
- Acid Insoluble Ash Value: Acid insoluble ash, insoluble in dilute hydrochloric acid is often more valuable than total ash in evaluating crude drugs due to contamination with silicaceous materials like earth and sand.
- Foreign Organic Matter: The parts of the organ or organs other than those parts of drugs mentioned in the definition and description of the drug are known as foreign organic matters.
- Stomatal Index: Stomatal index is the percentage of stomata forming in the total no. of epidermal cells, calculated using a formula.
- Stomatal Index (S.I.) =S/E + S ×100
- Where, S = number of stomata per unit area and
- E = number of epidermal cells in the same unit area

VII. PHYTOCHEMICAL TESTS

- Tests for alkaloids:

1. Dragendorff's 's test: By adding 1 mL of Dragendorff's reagent to 2 ml of extract orange red precipitate was formed, indicating the presence of alkaloids.
2. Mayer's test: Few drops of Mayer's reagent were added to 1 ml of extract yellowish white precipitate was formed, indicating the presence of alkaloids
3. Hager's test: Two ml of extract were treated with few drops of Hager's reagent yellow precipitate was formed, indicating the presence of alkaloids

- Tests for flavonoids:

Ten drops of dilute HCL and a piece of magnesium were added to 1 ml of extract deep pink colour indicating the presence of flavonoids

- Test for phenolic compounds and tannins:

(a) Ferric chloride test: Two ml of 5% neutral ferric chloride solution were added to 1 ml of extract dark blue coloring indicating the presence of phenolic compounds and tannins.

(b) Lead acetate test: One ml of lead acetate solution was treated with 0.5 mL of extract white precipitate formation indicating the presence of phenolic compounds and tannins.

VIII. FORMULATION TABLE

• FORMULATION TABLE

Sr.No	Ingredients	Quantity for 100g	Quantity for 30g
1.	Cinnamon Oil	13ml	4ml
2.	Bay leaf Oil	13ml	4ml
3.	Marigold Oil	13ml	4ml
4.	Cyclomethicone	6g	2g
5.	Cetyl Alcohol	20g	6g
6.	Na.Ascorbate	1g	0.3g
7.	Carbopol	2g	0.7g
8.	Glycerol Monosterate	6g	2g
9.	Lavender Oil	q.s	q.s
10.	D/W	q.s	q.s

IX. PROCEDURE FOR PREPARATION OF CREAM

- 1. Preparation of Aqueous Phase: 6g of Cetyl Alcohol, 0.3g of Na. Ascorbate, 0.7 g of Carbopol and 2g of Glycerol Monosterate was weighed accurately on the weighing balance, crushed in mortar pestle and transferred to the beaker. To this sufficient amount of D/W (30ml approx) was added and melted on the water bath to a temperature of 70ºC until everything in dissolved properly to a homogeneous mixture.
- 2. Preparation of Oil Phase: 4ml of Cinnamon Oil, Bay Leaf Oil, and Marigold Oil and 2g of Cyclomethicone was accurately measured and added to the beaker. The Beaker was placed in the water Bath and Heated to a Temperature of 72ºC until a homogeneous Solution was Obtained.
- 3.Addition of Oil Phase Into Aqueous Phase: The Oil Phase(72ºC) was added to the Aqueous Phase (70ºC) slowly by constant stirring until a homogeneous O/W Emulsion was Obtained. Few drops of Lavender Oil (Perfume) was added for fragrance and transferred into suitable container.

Further evaluation studies was carried out.

X. EVALUATION STUDY

Organoleptic Evaluation Determination of Appearance, Odour, Texture, Spreadability, Irritancy, Smear type was done by Visual Observation.

Determination of pH: The pH of the cream was evaluated by Digital pH meter.

Procedure: 10g of cream was taken in a beaker and to this a digital pH meter was inserted and the pH was recorded.

Determination of Homogeneity: The formulations was tested for the homogeneity by visual appearance and by touch.

Determination of Viscosity: The Viscosity was determined by using a BrookfieldViscometer using spindle number S-64 at 20 rpm at 25ºC.

XI. CONCLUSION

The study aims to create a polyherbal cream with the best properties and nutritional value from crude drugs like calendula officinalis flowers, cinnamonium zeylanicum dried bark, and cinnamonium tamala leaves.

The crude drug characters are studied for morphological, organoleptic, microscopic, physicochemical, and phytochemical evaluations. The cream is prepared using microwave oil extraction and undergoes evaluations such as organoleptic, pH, homogeneity, viscosity, spredability, emulsion, TLC, stability, and rational studies.

The cream has moisturizing and anti-inflammatory properties due to its core crude drug. Further studies are planned to evaluate its anti-inflammation and skin irritancy properties.

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