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Formulation and Evaluation of Herbal Ointment

for Skin

Mr. Ajay Angad Chalak, Mr. S. R. Pawar, Dr. K. P. Surwase

Aditya Institute of Pharmaceutical, Beed, Maharashtra, India

Abstract: *•In recent years there has been a significant increase increase in interest and utilization of herbal medicine due to wide range of application*

• Neem and Tulsi called as holy tree and herb has been used since ancient times for the treatment of various skin diseases.

• In this study Neem leaves Azadirachta indica Tulsi leaves Ocimum sanctum and Turmeric Corcuma longa was incorporated with various ingredients and a poly herbal cream was prepared.

- The goal is to develope herbal cream for moisturising nourishing and treating skin diseases
- The selection of the components is based on the agents therapeutics activities
- Azadiracta Indica, Curcuma Longa, Ocium Sanctum

Keywords: herbal medicine

I. INTRODUCTION

• The demand of cosmetics due to availability of herbal cosmetics is increasing predominantly

• The herbal formulation are receiving more concentration in public because of their high quality properties and less side effects

· Additionaly it also provide the skin with necessary nutrients and require moisture

• The herbal cream is basically water in oil type

• The selection of components based on agents therapeutics activities

• Several medicinal plants have been used in cosmetics preaparation since time immemorial and showed benefecial effects on various skin disease like acne

blackheads, skin rashes ,skin allergy ,ageing of skin ,wrinkles ,skin whitening agents etc

• Some very common plants like AZADIRACHTA INDICA ,CORCUMA LONGA

,OCIUM SANCTUM ,MANGIFERA INDICA etc have been extensively reported in Ayurvedic ,Sidha and Unani system of medicine for cosmetics plants

• Neem is helpful against a wide range of skin, disease including eczema, psoriasis, and dry

skin . Tulsi is used to add glow to the skin and to promote wound healing. In addition to these health promoting properties, tulsi is recommended as a treatment for a range of condition including anxiety, cough, and skin diseases.

• Tulsi OCIUM SANCTUM have wide range of application such as in maintaining good health of skin , soothes condition as eczema ,superbeneficial for skin

• Other benefits of tulsi includes, Natural immunity booster, Reduce stress and blood pressure, Fight acne, Prevent acne, Reduce stress

Control blood glucose level, Helping anti-aging ,Prevent kidney stone etc

• Turmeric CURCUMA LONGA has wide range of application Natural anti-inflamatery, powerful antioxidant, improve skin health, treats depression, clears the skin, anti-microbial agent etc .

• Reduce dark circles, treat and prevent diabetes







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• Benefits of Herbal ointment :

• Herbal ointments can help wounds heal due to the metabolites and lipophilic compounds extracted from herbal crude drugs.

· Herbal ointments can treat skin diseases with anti-inflammatory, anti-psoriatic, anti- cancer, and anti-infective properties

• Herbal ointments can help heal burn injuries by maintaining the skin's pH and moisture, and minimizing scar tissue formation.

• Some herbal ointments contain ingredients that have antioxidant and anti- inflammatory properties, which can help with wound healing.

- Herbal ointments are made from all-natural ingredients.
- Protective barrier: Herbal ointments can create a protective barrier on the skin.
- Herbal ointments can be low cost.
- · Herbal ointments can be easy to handle.

LITERATURE REVIEW

1. Dr. Sakthivel et,al.2023 :-

From the ancient time Neem and Turmeric is used for their various medicinal properties like antibacterial, antifungal, anti-inflammatory etc. thus this ointment could become a media to use these medicinal properties effectively and easily as a simple dosage form.

2. Ajay. S. Dongarwar, et al. 2024 :-

From the study it can be conduct that prepared ointment using Azadiracta Indica is suitable for treat or prevent skin infection and so better alternative other than allopathic ointment. Hence reduce the side effect and skin dryness of human skin. Azadiracta Indica has good antimicrobial properties and used for the treatment of skin infection cause by susceptible organism.

3. Gangidisireesha et al.2024 :-

Formulating herbal ointments using Neem, Turmeric, and Tulsi extracts provides a natural and effective approach in the treatment of dermatological infections. The combination of these herbs provides a broad spectrum of therapeutic activities and itself acts a preservative agent. Hence there is no need of additional flavouring and preservative agents. 4. Vaishnavi Tekale et al. 2024:-

Formulating herbal ointments using Neem, Turmeric, and Tulsi extracts provides a natural and effective approach in the treatment of dermatological infections. The combination of these herbs provides a broad spectrum of therapeutic activities and itself acts a preservative agent, Hence there is no need of additional flavouring and preservative agents. 5. Priyanshi Goyal et al.2024:-

The goal of the current study was to formulate and assess the herbal ointment. For this, a straightforward maceration procedure was used to prepare the herbal extracts, resulting in a fair yield of extract and minimal damage to the chemical contents or their activity. The ointment was made using the levigation procedure, which ensured that the herbal extract and ointment base were uniformly mixed and stable throughout storage.

6. Dnyaneshwar. B. Dhonnar et al. 2024 :-

From the ancient time Neem and Turmeric is used for their various medicinal properties like antibacterial, antifungal, anti-inflammatory etc. Thus, this ointment could become a media to use these medicinal properties effectively and easily as a simple dosage form. The ointment formulation is useful for the penetration and slowly absorb the drug in the skin. The consistency is smooth and no grinded particles are present in the formulation. The ointment gives non-irritant in skin and it is used by every type of skin like dry, oily, sensitive, and normal.

7. Sandip H. Lahare et al.2024 :-

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From the ancient times the neem, tulsi and haldi is naturally occurring medicinal plants is used for their various medicinal activities and properties like antibacterial, antifungal, antifungal, antioxidants, anti-inflammatory and wounds healing. Also used an anti- carciogenic properties that prevents the certain types of cancer. Thus this ointment could become a media to use these medicinal properties effectively and easily as a simple dosage form.

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8. Himal Chhetri et al 2010 :-

From the ancient time the herbal products Neem and Turmeric are used for various medicinal purposes such as antifungal, anti-inflammatory, antibacterial etc. The turmeric and neem ointment could be media for the use of these medicinal properties easily and effectively as a simple dosage forms.

9. Sanket R.vakte et al.2022 :-

From the ancient time the herbal products Neem and Turmeric are used for various medicinal purposes such as antifungal, anti-inflammatory, antibacterial etc. The turmeric and neem ointment could be media for the use of these medicinal properties easily and effectively as a simple dosage forms.

AIM AND OBJECTIVE

AIM : Formulation and evaluation of herbal ointment for skin

REQUIRMENT :

INSTRUMENTS : Digital Balance (Denver Instrument), PH paper, Heating plate, Thermometer, Beakers, Mortal Pestal,

CHEMICALAND REAGENTS :

Bees wax, Methyl paraben, Tragacanth, Coconut oil, Rose water, Glycerine, Neem extract, Tulsi extract, Turmeric powder & Borax.

OBJECTIVE:

Collection of plant. Preparation of herbal extract. Development of herbal formulations for the prepared extract. Characterization of the developed formulation

PLAN OF WORK





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DRUG PROFILING

ROSE WATER

Rose water is especially hydrating when combined with other moisturizing ingredients, such as ceramides or glycerin. Synonym :

Rosa banksia, Rosa odorata

Biological Source:

A rose is a woody perennial flowering plant of the genus Rosa, in the family Rosaceae.

Properties :

1. The antibacterial properties may help reduce acne. The anti-inflammatory properties can reduce skin redness and puffiness.

2. Rose Water Maintains the Skin's Natural pH Balance.

3. Chemically produced soaps and cleansers disrupt the pH balance of our skin, making it prone to bacteria that cause various skin conditions like rashes and acne. This property helps rose water restore the skin to its normal pH level. Uses :

1. Rose water is used in a lot of beauty products because of its ability to reduce the signs of ageing.

2. When applied to an area, rose water plumps the skin and improves the appearance of wrinkles.

3. Rose water also tightens the skin, meaning that your skin looks firmer and more radiant.



Fig 1. Rose water

METHYL PARABEN

Methylparaben is Methyl 4-hydroxybenzoate, a member of a family of alky esters of parahydroxybenzoic acid differing by their chemical substituents on the benzene ring. Methylparaben is supplied as an odourless, colourless crystalline or a white crystalline powde.

Pharmaceutical use:

Methyl paraben is a widely used preservative in various industries.

uses:

1. Preservative in topical preparations: Creams, ointments, lotions, and gels to prevent microbial growth.

2. Injectable solutions: As a preservative in injectable solutions, such as vaccines and antibiotics.

3. Oral medications: In some oral medications, like tablets and capsules, to extend shelf life.

Cosmetics and Personal Care:

1. Skincare products: Moisturizers, creams, lotions, and serums to prevent spoilage and extend shelf life.

2. Haircare products: Shampoos, conditioners, and styling products to prevent microbial growth.

3. Makeup and makeup removers: To prevent contamination and spoilage.

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BORAX

Borax, also known as sodium tetraborate, has several common features and uses: Physical Properties:

- 1. White crystalline powder
- 2. Soluble in water
- 3. Molecular formula: Na2B4O7·10H2O
- 4. Molecular weight: 381.37 g/mol

Pharmaceutical Uses:

- 1. Preservative: Prevents microbial growth in ointments, creams, and lotions.
- 2. pH Adjuster: Maintains optimal pH levels in pharmaceutical formulations.
- 3. Stabilizer: Enhances shelf life and stability of emulsions and suspensions.
- 4. Thickening Agent: Increases viscosity in topical preparations.
- 5. Emulsifier: Improves mixing and solubility of oil-water phases.

COCONUT OIL

Coconut oil comes from the nut (fruit) of the coconut palm. It contains medium-chain fatty acids, including capric acid, caprylic acid, and lauric acid.

About 52% to 85% of coconut oil is made up of specific saturated fats, called medium-chain fatty acids. It has a moisturizing effect when applied to the skin.

Uses :

1. Coconut oil has antibacterial properties and may help prevent infection.

2. Virgin coconut oil can increase the shelf life of herbal formulation and prevent microbial degradation.

3. Coconut oil helps to hydrate skin and reinforce its natural defensive barrier to better retain

Coconut oil can help speed up wound healing and improve antioxidant

BEES WAX

Beeswax comes from the honeybee, Apis mellifera, and other species of Apis Beeswax characteristics: Physical Properties

1. Appearance: Yellow to white, opaque



Fig 2 Bees wax

- 2. Odor: Mild, honey-like
- 3. Texture: Brittle, waxy
- 4. Melting Point: 180-190°F (82-88°C)
- 5. Density: 0.95-0.97 g/cm3

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Chemical Properties

- 1. Composition: Mainly esters, fatty acids, hydrocarbons
- 2. Solubility: Insoluble in water, soluble in organic solvents
- 3. pH: Neutral (pH 7-8)
- 4. Moisture Content: Low (<1%)
- 5. Stability: Resistant to oxidation, degradation Beeswax has various applications across industries:

Cosmetics and Personal Care

- 1. Skincare products (moisturizers, creams)
- 2. Lip balms and lips Pharmaceutical
- 1. Ointments and creams
- 2. Suppositories , Capsules etc Food Industry
- 1. Food wrapping (cheese, bakery)
- 2. Coatings for fruits and vegetablesg

GLYCERINE

Glycerine, also known as glycerol, is a versatile and widely used compound: Properties:

- 1. Colorless, odorless, and syrupy liquid
- 2. Molecular formula: C3H8O3
- 3. Molecular weight: 92.09 g/mol
- 4. Soluble in water and alcohol
- 5. Viscous and hygroscopic

Uses:

- 1. Pharmaceutical: Humectant, solvent, and excipient in medications
- 2. Cosmetics: Moisturizer, skin protectant, and hair care ingredient
- 3. Food: Sweetener, humectant, and texture modifier
- 4. Industrial: Antifreeze, lubricant, and solvent
- 5. Medical: Wound care, skin conditions, and respiratory treatments

Pharmaceutical Applications:

- 1. Topical creams and ointments
- 2. Oral solutions and suspensions
- 3. Injectable formulations
- 4. Suppositories and rectal solutions
- 5. Dental applications (e.g., mouthwashes)

Cosmetic Applications:

- 1. Skin care products (e.g., moisturizers, lotions)
- 2. Hair care products (e.g., shampoos, conditioners)
- 3. Soap and toothpaste formulations
- 4. Makeup and makeup removers

TRAGACANTH

Tragacanth, also known as Gum Tragacanth, is a natural polysaccharide derived from the sap of the Astragalus gummifer plant. Here are its key characteristics:

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Physical Properties:

- 1. Appearance: White or slightly yellowish powder
- 2. Odor: Mild, characteristic
- 3. Taste: Insipid (tasteless)
- 4. Solubility: Swells in water, forming a gel-like substance
- 5. Viscosity: High (100-400 mPa.s)

Chemical Properties:

- 1. Composition: Polysaccharide (arabinose, galactose, xylose, and glucuronic acid)
- 2. Molecular Weight: 300,000-400,000 Da
- 3. pH: Neutral (6.5-7.5)

4. Stability: Stable in aqueous solutions, but degrades with high temperatures or acidic conditions

- Functional Properties:
- 1. Thickening agent
- 2. Emulsifier
- 3. Stabilizer
- 4. Suspending agent
- 5. Film-forming agent

Pharmaceutical Applications:

- 1. Tablet binding and coating
- 2. Capsule formulation
- 3. Ointments and creams
- 4. Suspensions and emulsions
- 5. Controlled-release formulations

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- Food Applications:
- 1. Ice cream stabilizer
- 2. Salad dressing thickener
- 3. Sauce and gravy thickener

4. Bakery filling and topping

Tragacanth's unique properties make it a valuable ingredient in various industries. However, its high cost and limited availability have led to the development of alternative gums.



Fig 3. Tragacanth

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SELECTION OF DRUGS

PLANTS SELECTED FOR THE PRESENT STUDY

In present study the following plants which have been demonstrated for antibacterial activity are selected and were used for the development of herbal formulations.

- Azadirachta indica
- Ocimum sanctum
- Curcuma longa

• AZADIRACHTA INDICA

Azadirachta indica, commonly known as neem or nimtree. It belongs to the family meliaceae. It is typically grown in tropical and semi-tropical regions.



Fig 4. Azadirachta indica

Medicinal uses:

wound healing, anti-inflammatory, antibacterial. antiseptic, antifungal.
Scientific Classification: Kingdom: Plantae
Subkingdom: Tracheobionta
Division: Magnoliophyta Class: Magnoliopsida
Subclass: Rosidae Order: Sapindales Family Vernacular Names:
Vernacular Names:
Botanical name: Azadirachta indica A. Juss English: Neem tree
Tamil: Vembu Hindi: Neem
Malayalam: Ariyaveppu

• OCIMUM SANCTUM

Ocimum sanctum commonly called as tulsi, It is found in tropical and subtropical countries. It is an aromatic perennial plant in the family Lamiaceae



Fig 5 Ocimum sanctum

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 Scientific Classification: Kingdom: Plantae Division: Magnoliophyta Class: Magnoliopsida Family:Lamiaceae Genus: Ocimun Order: lamiales

Species: Ocimun sanctum

2. Chemical constituents:

Chemical Constituents of cirsilineol, circimaritin, isothymusin, apigenin, rosamericacide, eugenol, carvacrol, caryophyllene, orientin, andvicenin, tanninsand flavonoids.

3. Therapeutics Properties:

Medicinal uses:

Antimicrobial activity/ broad spectrum Antimicrobial properties including antibacterial, antiviral, antifungal an antiprotozoal properties. Antiinflammatory, Antioxidant, Antidiabetic, Blood pressure control, Antiulcer, Antistress and Cardioprotective.

• CURCUMA LONGA

Curcuma longa is commonly known as turmeric plant . It is perennial plant in family Zingibarace It found mainly in South Asia



Fig 6 Curcuma longa

Scientific Classification : Kingdom: Plantae
 Class: Liliopsida - Monocotyledons
 Subclass: Zingiberidae
 Order: Zingiberales
 Family: Zingiberaceae Martinov - Ginger family Genus: Curcuma
 Species: Curcuma longa

2 : Chemical Constituents : curcumin, demethoxycurcumin, and bisdemethoxycurcumin.

3 : Therapeutic Properties :

Curcumin has been shown to have broad-spectrum antimicrobial activity, including antibacterial, antiviral, antifungal, and antimalarial activities.

Curcuma longa has wound-healing, antioxidant, antiproliferative activities etc

FORMULATION OF OINTMENT COLLECTION OF MATERIAL

1. The leaves of Azadirachta Indica collected from the surrounding area of Botanical Garden, Aditya institute of pharmaceutical beed-431122

2. The leaves were cleaned, dried in shade and crushed to coarse powder. and stored in container until further use.

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3. The leaves of Ocimun sanctum collected from the surrounding area of Botanical Garden, Aditya institute of pharmaceutical beed-431122

4. The crude drug of curcuma longa collected from Pharmacognosy lab of Aditya institute of pharmaceutical beed

PREPARATION OF EXTRACTION

1. AZARDIRACHTA INDICA :

40gm powder of Azardirachta indica was weighed and macerated in 96% v/v ethanol Then kept for 3 days with occasional shaking. After 3 days filtrate by using filter paper. Then the filtrate was evaporated by using water bath.



Fig 7 neem extract

2. OCIMUN SANCTUM :

30gm of coarsely powder of ocimunsanctm is weighed and macerated in 99% ethanol then kept it for 2 days with occasional shaking. After 2 days filtrate by using filter paper. Then the filtrate was evaporated by using water bath.



Fig 8 tulsi extract

3. CURCUMA LONGA :

Crude Curcuma longa was taken and coarsly powdered by using mortar pestel then weigh required gram of powder Curcuma longa

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PREPARATION OF OINTMENT

1. Beez wax was taken in beaker melted on heating metal , the temperature of which was not exceeded beyond 70-75 $^{\circ}$ C .When the wax was completely melted, glycerin and coconut oil was added and allowed the entire mixture to remain on the heating metal until liquefied.

2. Take another beaker take Borax, Methyl Paraben and Tragacanth in distilled water melt on heating metal maintain temperature 65-75 $^{\circ}$ C

3. Now add slowly heated liquid phase in a oil phase with continuous and vigorous stirring

4. After proper mixing of both phases immediately add neem extract, tulsi extract, turmeric powder with continuos stirring

5. Add quantity sufficient rose water to the formulation with continues stirring until it form smooth ointment

- 6. The preapared formulation was cooled to room temperature
- 7. The formulation transfer to container



Fig 9. Final product

FORMULATION OF OINTMENT :

Sr No	Ingredients	Quantities	Function
1	Beez wax	5 gm	Base, Thickening agent
2	Glycerin	5ml	Moisturizing agent
3	Coconut oil	10 ml	Healing
4	Neem extract	5ml	Antibacterial, Antifungal, Anti aging etc
5	Tulsi extract	5ml	Anti aging, Add glow to face
6	Turmeric powder	1 gm	Antiseptic, Anti inflametary, wound
			healing etc
7	Borax	0.36 gm	Alkanating agent
8	Tragacanth	1 gm	Emulsifier
9	Methyl Paraben	0.59	Preservative
10	Rose water	Quantity sufficient	Fragrance

EVALUATION RESULTS

The results of the evaluation are shown in Table Prepared formulation was greenish in colour. It has a pleasant odour and smooth texture.

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1. Physical properties: -

The physical properties of formulated ointment were judged by colour, odour and texture.

Sr.no.	Parameters	Evaluation
1.	Colour	Yellowish
2.	Odour	Pleasant
3.	Texture	Smooth

2. Washability:

An ointment applied on skin was easily removed by washing with tap water.

3. pH of the cream:

The pH of an ointment was found to be basic in nature as red litmus paper turns blue, which is good for skin.



4. Spread ability test:

The spread ability test showed that the formulated cream has good spreadable property



5. Irritancy test:

The formulated cream shows no redness, oedema, irritation or inflammation during studies. The formulated cream is safe to use.

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6. Homogeneity:

The homogeneity of the formulated cream was judged by the visual appearance and touch. The appearance and touch of the cream was good

II. CONCLUSION

In Ayurveda Neem, Tulsi and Turmeric were used for various medicinal properties like antibacterial, anti-inflammatory, wound healing. By using these properties of plant the formulation was prepared known as ointment. For the formulation of an ointment by maceration process initially the extract of these plants was taken. About five formulations were prepared by changing the concentrations of extract in each formulation. The F1 shows the good Spreadability, good consistency & physicochemical parameters during study period and appeared better results. The final results can be concluded by using the stability study and it defines the F1 is stable. So, herbal ointment which is non-toxic, safe; effective by using herbal extract would be highly acceptable.

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