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Formulation and Evaluation of Argemone Mexicana Linn Leaves as Antifungal Cream

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Abstract: *Herbal medicines have gained significant importance in recent years because of their safety, effectiveness, and fewer side effects compared to synthetic drugs. The present study focuses on the formulation and evaluation of a herbal antifungal cream prepared from the leaves of Argemone mexicana. The leaves were collected, shade dried, powdered, and extracted using ethanol through the maceration method.*

The obtained extract was subjected to phytochemical screening to detect the presence of active constituents such as alkaloids. The extract was then incorporated into a topical cream formulation prepared using suitable ingredients like beeswax, white soft paraffin, liquid paraffin, and hard paraffin.

The prepared cream was evaluated for various physical parameters such as colour, odour, texture, homogeneity, and pH. The results showed that the cream possessed acceptable physical characteristics and showed the presence of medicinally active compounds. Thus, the herbal cream prepared from Argemone mexicana leaves may be useful in the treatment of fungal infections of the skin.

Keywords: *Herbal medicines*

I. INTRODUCTION

Skin infections caused by fungi are common health problems worldwide. These infections are mainly caused by fungi such as Candida albicans, Aspergillus niger, and dermatophytes. These microorganisms grow on the skin and cause symptoms such as itching, redness, irritation, inflammation, and scaling.

Many synthetic antifungal drugs are available in the market, but their long-term use may lead to side effects such as skin irritation and resistance. Therefore, herbal medicines are considered a safer and economical alternative.

Argemone mexicana, commonly known as Mexican poppy, is a medicinal plant widely distributed in India. It belongs to the Papaveraceae family and grows abundantly along roadsides and waste lands. Traditionally, this plant has been used in folk medicine for treating skin diseases, wounds, inflammation, and infections.

The plant contains various bioactive compounds such as alkaloids, flavonoids, phenols, and glycosides which are responsible for its pharmacological activities like antifungal, antibacterial, anti-inflammatory, analgesic, and antioxidant properties.

Because of these medicinal properties, the present study was undertaken to formulate and evaluate a herbal antifungal cream using the leaf extract of Argemone mexicana.Cosmetics play an important role in human life by improving appearance and maintaining skin health. In modern society, the demand for cosmetic products has increased significantly. People are becoming more aware of the ingredients used in cosmetic products and are showing greater interest in herbal and natural formulations.

Herbal cosmetics are products that contain plant-based ingredients which provide therapeutic benefits along with cosmetic effects. These products are prepared using extracts obtained from medicinal plants. Herbal cosmetic formulations are considered safer than synthetic cosmetic products because they contain natural ingredients and produce fewer side effects.

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The skin is the largest organ of the human body and acts as a protective barrier against environmental factors such as dust, microorganisms, and harmful chemicals. Proper skin care is necessary to maintain healthy skin and prevent skin diseases. Herbal cosmetic products help nourish the skin, maintain moisture, and protect it from damage.

Turmeric is one of the most important medicinal plants used in traditional medicine. It has been used for centuries in Ayurvedic and traditional Indian medicine for treating various diseases. The rhizome of turmeric contains curcumin which is responsible for many pharmacological activities. Curcumin exhibits antimicrobial, antioxidant, anti-inflammatory, and wound healing properties. Because of these properties, turmeric is widely used in cosmetic products for improving skin health.

Sandalwood is another valuable natural ingredient used in skin care products. Sandalwood oil obtained from the heartwood of Santalum album has cooling and soothing properties. It is commonly used in face creams, lotions, soaps, and perfumes. Sandalwood helps reduce skin irritation, inflammation, and redness. It also improves skin complexion and provides a pleasant fragrance.Creams are semisolid emulsions that are commonly used for topical application on the skin. Cream formulations are generally classified into two types: oil-in-water (O/W) creams and water-in-oil (W/O) creams. Oil-in-water creams are non-greasy and easily washable, whereas water-in-oil creams are more moisturizing and oily in nature.

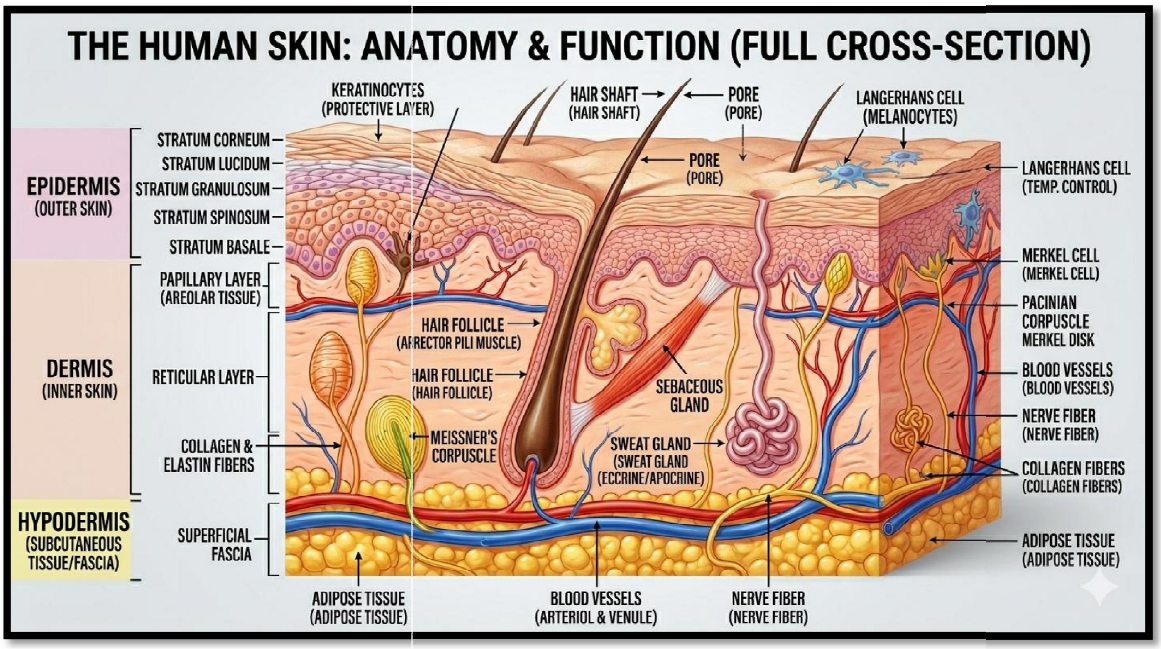

Fig. No 1 . Skin

Aim and Objectives

Aim

To formulate and evaluate a herbal antifungal cream using the ethanolic extract of Argemone mexicana leaves.

The main aim of this research work is to formulate and evaluate a herbal cream containing turmeric and sandalwood for cosmetic and skin care applications.

The study focuses on developing a safe and effective herbal cosmetic formulation using natural plant ingredients. The prepared cream is evaluated to determine its physical properties, stability, and suitability for topical application on the skin.

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Objectives

- To collect fresh leaves of Argemone mexicana from the local area.
- To prepare ethanolic extract of the plant leaves using the maceration method.
- To perform phytochemical screening of the extract for the detection of alkaloids.
- To prepare a topical herbal cream formulation using the extract.
- To evaluate the prepared cream for its physicochemical properties such as colour, odour, texture, homogeneity, and pH.
- To formulate herbal cream
- To prepare a herbal cream formulation using turmeric and sandalwood as active ingredients along with suitable excipients.
- To study the medicinal properties of turmeric and sandalwood

II. LITERATURE REVIEW

Gupta S.C. et al. (2013)

Gupta S.C. and co-workers studied the pharmacological activities of curcumin which is the major active component present in turmeric (Curcuma longa). According to their research, curcumin possesses strong antioxidant, antibacterial, and anti-inflammatory properties. The researchers reported that curcumin helps in reducing skin infections, inflammation, and oxidative stress. Their study concluded that turmeric extract can be effectively used in herbal cosmetic formulations such as creams, lotions, and gels for improving skin health.

Prasad S. and Tyagi A.K. (2014)

Prasad and Tyagi conducted research on the medicinal properties of curcumin obtained from turmeric. Their study showed that curcumin exhibits strong antimicrobial activity against several microorganisms including bacteria and fungi. They reported that turmeric extract can prevent microbial infections on the skin and promote wound healing. Therefore, turmeric is considered a valuable ingredient in herbal cosmetic products.

Dwivedi C. and Laddha K.S. (2012)

Dwivedi and Laddha studied the importance of herbal cosmetics in modern pharmaceutical science. According to their research, herbal cosmetic formulations are safer and more effective compared to synthetic cosmetic products. They also reported that plant-based ingredients are less likely to cause skin irritation or allergic reactions. Their study highlighted the importance of using medicinal plants such as turmeric and sandalwood in cosmetic formulations.

Kapoor V.P. (2005)

Kapoor V.P. studied the cosmetic and medicinal properties of sandalwood (Santalum album). According to his research, sandalwood oil contains active compounds such as santalol which provide antiseptic, anti-inflammatory, and cooling effects. Sandalwood is widely used in cosmetic products because it helps soothe irritated skin and improve skin complexion. The study concluded that sandalwood is a valuable ingredient for preparing herbal cosmetic creams.

Khan A. and Rahman M. (2011)

Khan and Rahman investigated the pharmacological activities of sandalwood oil. Their research reported that sandalwood oil possesses antimicrobial and anti-inflammatory properties. They also observed that sandalwood oil helps reduce skin redness and irritation. Therefore, sandalwood oil is commonly used in cosmetic products such as creams, lotions, soaps, and perfumes.

Chanchal D. and Swarnlata S. (2008)

Chanchal and Swarnlata conducted a review on herbal cosmetics and their importance in modern skin care products. Their study reported that herbal cosmetic products provide both cosmetic and therapeutic benefits. They emphasized that natural ingredients used in herbal cosmetics help nourish the skin and protect it from environmental damage.

Mishra A.P. and Saklani S. (2014)

Mishra and Saklani conducted a research study on the formulation and evaluation of herbal creams prepared from plant extracts. According to their findings, herbal creams possess good stability, spreadability, and skin compatibility. Their

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study concluded that herbal cosmetic formulations prepared using medicinal plants are effective for maintaining healthy skin.

Patel R.P. and Trivedi B. (2012)

Patel and Trivedi developed a herbal cosmetic cream using natural plant extracts and evaluated its physicochemical properties. Their research reported that herbal creams provide moisturizing effects and help maintain skin hydration. They also concluded that herbal creams are effective in protecting the skin from microbial infections.

III. PLANT PROFILE

Introduction

Argemone mexicana is a medicinal plant commonly known as Mexican poppy. It is widely distributed in tropical and subtropical regions of the world. The plant grows abundantly in India, especially along roadsides, wastelands, and dry fields. It is considered a hardy plant that can survive in poor soil conditions.

The plant has been traditionally used In herbal medicine for the treatment of several diseases such as skin infections, wounds, inflammation, and microbial infections. Various parts of the plant including leaves, seeds, flowers, and roots possess medicinal properties.

The leaves of Argemone mexicana contain several active phytochemical constituents such as alkaloids, flavonoids, and phenolic compounds which are responsible for its antimicrobial and antifungal activities. Because of these properties, the plant is widely studied in pharmaceutical research for the development of herbal medicines.

Scientific Classification

Kingdom : Plantae
Division : Magnoliophyta
Class : Magnoliopsida
Order : Ranunculales
Family : Papaveraceae
Genus : Argemone
Species : Argemone mexicana

Geographical Distribution

Argemone mexicana is widely distributed in tropical and subtropical regions of the world. It is commonly found in countries such as India, Mexico, Brazil, and other parts of Central and South America.

In India, the plant grows naturally in many states including Maharashtra, Gujarat, Rajasthan, Madhya Pradesh, and Uttar Pradesh. It usually grows in dry and sandy soil along roadsides, open fields, agricultural lands, and wastelands.

The plant does not require special climatic conditions and can easily grow in warm environments. Because of its strong adaptability, it spreads rapidly in many regions.

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Fig.No 2 . Aregmona maxicana

IV. MATERIALS AND METHODS

The materials used for the preparation of antifungal cream from Argemone mexicana leaves include plant material, chemicals, and laboratory equipment.

Ingredients and Quantity

The quantity ingredients is shown below:

SR. NO	Ingredients	Formulation 1	Formulation 2	Formulation 3
1	White Soft Paraffin	10 g	9 g	11 g
2	Hard Paraffin	7 g	6.5 g	8 g
3	Bees Wax	4.5 g	3 g	5 g
4	Liquid Paraffin	45 g	43 g	48 g
5	Borax	0.2 g	0.1 g	0.2 g
6	Argemone mexicana Leaves Extract	1 ml	1 ml	1 ml
7	Perfume	q.s.	q.s.	q.s.
8	Water	q.s.	q.s.	q.s.
8	Water	Up to 100 gm	Up to 100 gm	Up to 100 gm

Fig.No 3 . Materials and Methods

Collection of Plant Material

Fresh leaves of Argemone mexicana were collected from the local area and identified properly.Fresh leaves of Argemone mexicana were collected from the local area, mainly from open fields and roadsides where the plant grows naturally. The plant was carefully identified based on its morphological characteristics such as yellow flowers, spiny leaves, and the presence of yellow latex.

Only healthy and disease-free leaves were selected for the experiment. The collected leaves were washed thoroughly with clean water to remove dust, soil particles, and other impurities. After washing, the leaves were kept on clean paper and allowed to dry under shade at room temperature.

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Fig.No.4 Collection of Plant Material

Preparation of Herbal Extract

The cleaned leaves were dried in shade for about 14–15 days until they became completely dry. Shade drying was preferred in order to prevent the loss of important active constituents present in the plant.

After complete drying, the leaves were powdered using a grinder to obtain a fine powder. The powdered material was stored in an airtight container to protect it from moisture and contamination.

About 30 g of powdered leaves were taken and soaked in 100 ml ethanol for about 3–4 days using the maceration method. During this period the mixture was stirred occasionally to allow proper extraction of active compounds.After maceration, the mixture was filtered using filter paper. The filtrate obtained was collected in a clean beaker.

Phytochemical Screening for Alkaloids

Dragendorff's Test

The extract was treated with Dragendorff's reagent. The formation of orange-red precipitate indicates the presence of alkaloids.

Fig.No 7 . Dragendorff's Test

Hager's Test

The extract was treated with Hager's reagent. The formation of yellow precipitate indicates the presence of alkaloids.

Wagner's Test

The extract was treated with Wagner's reagent. The formation of brown precipitate indicates the presence of alkaloids.

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Preparation of Herbal Cream

The cream was prepared by the emulsification method.

Oily Phase:

Beeswax, white soft paraffin, liquid paraffin, and hard paraffin were melted together at 65–70°C.

Aqueous Phase:

Distilled water was heated separately to the same temperature.

The aqueous phase was slowly added to the oily phase with continuous stirring. When the mixture cooled to about 40°C, the herbal extract was added and mixed thoroughly to obtain a uniform cream.

Fig.No 8 . Preparation of Herbal Cream

Results

Antifungal Activity of Argemone mexicana Leaves Extract:

In the present study, the ethanolic extract of Argemone mexicana leaves exhibited

Significant antifungal and antimicrobial activity against selected microorganisms. The extract showed inhibitory effects on both bacterial and fungal strains, indicating its broad-spectrum antimicrobial potential

The phytochemical screening showed positive results for alkaloids. The prepared cream was evaluated for various physical parameters.

Alkaloid Test Results

Dragendorff's Test - Orange-red precipitate - Positive

Hager's Test - Yellow precipitate - Positive

Wagner's Test - Brown precipitate – Positive

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Physical Evaluation of Cream

After the preparation of the herbal cream, various evaluation tests were carried out to determine the quality, stability, and suitability of the formulation for skin application. These evaluation tests help ensure that the cream possesses desirable physical and chemical properties.

Physical Appearance

The prepared cream was visually examined for its color, odor, texture, and consistency. A good herbal cream should have uniform color, smooth texture, and pleasant fragrance.

Observation: The prepared turmeric and sandalwood cream showed smooth texture and uniform appearance with pleasant odor.

pH Determination

The pH of the cream was measured using a digital pH meter. The pH of cosmetic creams should be close to the natural pH of the skin to avoid irritation.

Procedure: A small amount of cream was dissolved in distilled water and the pH was measured using a pH meter.

Observation: The pH of the cream was found to be within the acceptable range for skin application.

Spreadability Test

Spreadability is an important property of cream formulations because it determines how easily the cream spreads on the skin.

Procedure: A small amount of cream was placed between two glass slides and slight pressure was applied. The time required for the cream to spread was observed.

Observation: The cream showed good spreadability which indicates easy application on the skin.

Washability Test

Washability test determines whether the cream can be easily removed with water.

Procedure: A small quantity of cream was applied on the skin and washed with water.

Observation: The cream was easily washable and did not leave oily residue.

Homogeneity Test

Homogeneity refers to the uniform distribution of ingredients in the cream formulation.

Procedure: The cream was examined by visual inspection and touch to check uniformity.

Observation: The cream showed good homogeneity with no lumps or aggregates.

Skin Irritation Test

Skin irritation test was performed to ensure the safety of the cream.

Procedure: A small amount of cream was applied to a small area of skin and observed for 24 hours.

Observation: No redness, itching, or irritation was observed.

REFERENCES

[1]. Aloyo A. Muinat (2015). Antimicrobial studies of Argemone mexicana.
[2]. Abdulkarim Yehia (2016). Extraction and evaluation of herbal cream from Argemone mexicana.
[3]. Bhattacharjee et al. (2006). Antibacterial activity of Argemone mexicana.
[4]. Tripathi K.D. (2004). Essentials of Medical Pharmacology.
[5]. Kokate C.K., Purohit A.P., Gokhale S.B. Pharmacognosy, Nirali Prakashan, Pune.
[6]. Agrawal S.S., Paridhavi M. Herbal Drug Technology, Universities Press, Hyderabad.
[7]. Khandelwal K.R. Practical Pharmacognosy, Nirali Prakashan.
[8]. Lachman L., Lieberman H.A., Kanig J.L. The Theory and Practice of Industrial Pharmacy, Varghese Publishing House.
[9]. Aulton M.E. Aulton's Pharmaceutics: The Design and Manufacture of Medicines, Churchill Livingstone.
[10]. Remington. Remington: The Science and Practice of Pharmacy, Pharmaceutical Press.
[11]. Trease G.E., Evans W.C. Pharmacognosy, Saunders Publishers.

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[12]. Sharma P.P. Cosmetic Formulation, Manufacturing and Quality Control, Vandana Publications.
[13]. Barel A.O., Paye M., Maibach H.I. Handbook of Cosmetic Science and Technology, CRC Press.
[14]. Harry R.G. Harry's Cosmeticology, Chemical Publishing Company.
[15]. Indian Herbal Pharmacopoeia, Indian Drug Manufacturers Association, Mumbai.
[16]. Indian Pharmacopoeia Commission. Indian Pharmacopoeia, Government of India.
[17]. Sharma R.K., Dash B. Charaka Samhita, Chaukhambha Sanskrit Series Office.
[18]. Kapoor L.D. Handbook of Ayurvedic Medicinal Plants, CRC Press.
[19]. Pandey G., Madhuri S. Pharmacological Activities of Turmeric, International Journal of Pharmaceutical Sciences.
[20]. Gupta S.C., Patchva S., Aggarwal B.B. Therapeutic Roles of Curcumin, AAPS Journal.
[21]. Prasad S., Tyagi A.K. Curcumin and its Medicinal Properties, Journal of Clinical Immunology.
[22]. Dwivedi C., Laddha K.S. Herbal Cosmetics: An Overview, International Journal of Pharmaceutical Research