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PREPARATION AND EVALUATION OF POLY HERBAL ANTI-ACNE CREAM

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Abstract
Acne is the most common inflammatory disorder that occurs when oil glands become blocked. From ancient times, it is believed that herbal medicine is safer and has fewer side effects compared to synthetic medicine. The herbal therapeutic industry is one of the oldest methods of treating diseases, with its origins traceable to the Vedas. The present study focuses on the preparation and evaluation of a polyherbal anti-acne cream containing powdered extracts of Neem leaves (Azadirachta indica), Tulasi leaves (Ocimum sanctum), Turmeric powder (Curcuma longa), Aloe vera juice (extracted from Aloe barbadensis), orange peel powder, rosemary oil, tea tree oil, and honey. Although various topical herbal formulations for acne are already available on the market, we aim to develop a pure polyherbal formulation. The selected plants have been well-documented in the literature for their antimicrobial, antioxidant, and anti-inflammatory properties. The cream was evaluated based on several parameters such as color, appearance, pH, and spreadability. This formulation represents a significant attempt to develop an effective herbal anti-acne cream using powdered extracts of Neem, Tulasi, Turmeric, Orange Peel, and Aloe Vera juice.

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Introduction

Skin is perhaps the most vulnerable part of our body. Throughout history, humans have been obsessed with caring for their skin. The concept of caring for one's beauty has been around for ages, good skin has always been a key component of overall beauty and good health. It is a well known fact that day to day exposure of human skin lead to number of problems such as acne, pimples, pigmentation and sunburn marks. Acne vulgaris is a disease of pilosebaceous unit characterized by the formation of open and closed comedones, papules, pustules, nodules and cysts. It is the most common disorder treated by dermatologists. Lesions are most common on the face, but the neck, chest, upper back, and shoulders may also be affected. The term acne is derived from Greek word "acme" which means "prime of life". Although generally considered to be a benign, self limiting condition, and despite its apparent cosmetic nature, its effects can go far deeper than the surface of the skin, and can place a heavy emotional and psychological burden on patients that may be far worse than the physical impact. Acne is a disease of the pilosebaceous units in the skin. A changed keratinisation pattern in the hair follicle leads to blockage of sebum secretion. It is probable that hyper responsiveness to the stimulation of sebocytes and follicular keratinocytes by androgens leads to the hyperplasia of sebaceous glands and seborrhea that characterise acne. The enlarged follicular lumen attributable to inspissated keratin and lipid debris forms a closed comedone (whitehead). When the follicle has a portal of entry at the skin, the semisolid mass protrudes forming a plug, producing an open comedone (blackhead). Since the most frequent bacteria isolated from acne patients were Staphylococcus aureus, it is possible that acne vulgaris is mainly caused by Staphylococcus aureus rather than Propionibacterium acnes. This is in contrast to some reports which implicated both Staphylococcus epidermidis and Propionibacterium acnes as bacteria causing acne

vulgaris. It may be concluded that geographical regions affect the bacteria involved in acne vulgaris. However, the presence of microorganisms is not a strict prerequisite for comedo formation. Further, P. acnes belongs to the resident cutaneous flora. P. acnes colonizes the follicular duct and proliferates, breaking down the sebum to triglycerides, irritants that probably contribute to the development of inflammation. When the follicular epithelium is invaded by lymphocytes it ruptures, releasing sebum, microorganisms, and keratin into the dermis. Neutrophils, lymphocytes, and foreign body giant cells accumulate and produce the erythematous papules, pustules, and nodular swelling characteristic of inflammatory acne. The use of natural remedies, particularly herbal medicine, dates back thousands of years. In recent years, natural approaches to combating acne and its disfiguring effects have gained popularity. Several botanicals with a history of use in traditional cultures have entered the growing 'cosmeceuticals' market. With fewer adverse side effects and the added advantage of multi-functionality, botanicals are increasingly being used in mainstream cosmetic products, including acne fighting compositions. Quinones, flavanoids, polyphenols, tannins, terpinoids, alkaloids and essential oils all exhibit antimicrobial activity. In this study there are four herbal materials which are used to investigate the anti-acne property. They are: Turmeric, Thyme, Sandalwood and Safflower. The aim of this study was to find the anti-acne property of a poly herbal formulation. The Objectives were

- Preparation of poly herbal extract
- Evaluation of the poly herbal extract
- Preparation of poly herbal cream formulation
- Evaluation of the poly herbal cream formulation.

Materials and Methods

Plant Material

Local traditional herbs were used for study

Neem [Azadirachtaindica], Tulasi [Ocimum sanctum] leaves were shade dried and made into fine powder . Aloe vera juice was collected from the fresh aloe [Aloe barbadensis] ,Turmeric [Rhizome]powder , orange peel powder ,honey , rosemary oil , tea tree oil were purchased from the local herbal store.

Solvents

Distilled water.

Chemicals

Triethanol amine

Apparatus:

Electronic weighing balance, Mechanical sieve shaker, Mixer, Mortar and pestle, Beaker, Pipette, glass rod, filter.

Method of Preparation

Both Neem and Tulasi leaves were shade-dried for four days, then ground into a fine powder using a mixer and sieved. Aloe vera juice was extracted from fresh Aloe vera leaves and filtered using a filter. Turmeric powder was procured from a herbal store. Orange peel powder, Vitamin E capsules, honey, tea tree oil, and rosemary oil were also collected for the formulation. The fine powders of Tulasi and Neem leaves were taken into a clean, dry mortar and triturated thoroughly. Turmeric powder was added, followed by orange peel powder, and the trituration was continued. Then, Aloe vera juice was gradually added during mixing. After that, the contents of the Vitamin E capsules and triethanolamine were added. Tea tree oil was added drop by drop, followed by rosemary oil. Finally, honey was incorporated to achieve the desired consistency of the cream.

Table 01: Formulation Table

S:NO	NAME OF THE INGRIDIENT	QUANTITY IN [GM]
1.	Neem	5 gm
2.	Tulasi	10 gm
3.	Turmeric	1 gm
4.	Aloe vera	10 ml
5.	Orange peel powder	20 gm
6.	Rosemary oil	5 ml
7.	Tea tree oil	2 ml
8.	Vitamin –E capsules	1-2 %
9.	Triethanol amine	3 ml
10.	Honey	5 ml
11.	Distilled water	Q.s to 50 gm

Ingredients Used

Neem - Anti inflammatory
Tulasi - Anti fungal
Aloe vera – Emollient
Turmeric – Anti inflammatory
Orange peel –Brighten up the skin, Anti-oxidant
Vitamin –E - Anti oxidant
Tea tree oil - Anti acne lesions
Rose maryoil - Anti bacterial
Honey - Anti bacterial

Neem

Biological source: Azadirachta indica
Chemical constituents: Nimbin , Quercetin
Property: Anti – inflammatory
Uses: Reduce the acne

Turmeric
Biological source: Curcuma longa
Chemical constituents: Curcumin, Curcuminoids
Property: Anti-inflammatory
Uses: Treat acne scars.

Tulasi
Biological source: Ocimum sanctum
Chemical constituents: Eugenol
Property: Anti- fungal activity
Uses: Reduce the acne and pimples

Aloevera
Biological source: Aloe barbadensis
Chemical constituents: vitamins, enzymes
Property: Emollient
Uses: Helps to reduce the acne

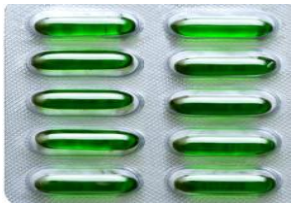
Orange Peel
Biological source: Citrus sinensis
Chemical constituents: Cellulose.
Property: Anti-oxidant
Uses: Heal the acne

Honey
Biological source: Apis mellifera
Chemical constituents: Maltose, glucose
Property: Anti-bacterial
Uses: Improve the apperance of the skin

Teatree Oil
Biological source: Melaleuca alternifolia
Chemical constituents: Trepinene
Property: Anti-inflammatory
Uses: Prevent irritation on skin

Rose Mary Oil
Biological source: Rosmarinus officinalis
Chemical constituents: Rosmanol
Property: Anti-bacterial
Uses: Prevent the skin pores

Vitamin –E Capsules
Biological source: RRR-Alpha tocopherol
Chemical constituents: Alpha beta gamma Deltatocopheral
Property: Anti-oxidant
Uses: It can heal the acne and scars



Evaluation Parameters
Physical Examination
Colour:
Formulated anti-acne cream was evaluated for its colour.

Visual:

The visually colour was checked.

Odour:

Pleasant Odour was found by smelling the product.

Chemical Examination

PH Determination

PH offormulated polyherbal anti-acne cream PH5.5 wasdetermined byusing PHmeter .

Spreadability

In this method, the slip and drag characteristics of the cream were evaluated. Two grams (2 g) of the formulated cream were placed on a clean glass slide. Another glass slide was placed over it, forming a sandwich with the cream in between. This setup was left undisturbed for 5 minutes to expel air and ensure the formation of a uniform film of cream between the slides. Excess cream was carefully scraped off from the edges. The top slide was then subjected to a pulling force of 70 g, applied using a string attached to a hook. The time (in seconds) required for the top slide to move a distance of 5.7 cm was recorded. A shorter time interval indicates better spreadability of the cream.

Homogenisity

The formulation was tested for homogeneity by evaluating its appearance and touch.

Viscosity

A Brookfield viscometer was used to test the viscosity of the formulation, with the appropriate spindle number selected based on the sample type. A 50 mL beaker was used to hold 50 grams of the cream. The spindle was immersed in the preparation until the spindle groove was fully submerged, and the RPM (revolutions per minute) was set accordingly. The viscosity of the anti-acne cream was measured at 10, 20, 30, 40, and 50 RPM. The viscosity values were calculated using the multiplication factor obtained from the viscometer reading.

Conclusion

For a long time, the use of chemicals in the formulation of anti-acne creams has been a common practice. However, due to their harmful side effects, such formulations are becoming less popular nowadays. In contrast, the use of natural polyherbal anti-acne creams has been gaining significant attention among researchers because of their safety, multiple biological actions on the skin, and cost-effectiveness. The beneficial properties of medicinal plants make them highly suitable as ingredients in anti-acne cream formulations. Plant-based actives are increasingly preferred over chemical-based creams due to their effective action against stress-induced acne, acne lesions, and facial acne.

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Author Contributions

All authors are contributed equally

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