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FORMULATION AND EVALUATION OF HERBAL ANTI ACNE CREAM CONTAINING TINOSPORA CORDIFOLIA AND SANTALUM ALBUM

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ABSTRACT

Acne vulgaris is a common inflammatory skin disorder affecting individuals of different age groups, particularly adolescents. Conventional anti-acne treatments may produce side effects such as skin irritation, dryness, and microbial resistance. Herbal formulations are considered safer alternatives due to their natural origin and therapeutic benefits. The present study aimed to formulate and evaluate a herbal anti-acne cream containing Tinospora cordifolia and Santalum album. Tinospora cordifolia possesses antimicrobial, antioxidant, and anti-inflammatory properties, while Santalum album exhibits cooling, soothing, antibacterial, and skin-protective activities. The herbal extracts were incorporated into an oil-in-water cream base and evaluated for various physicochemical parameters including appearance, pH, viscosity, spreadability, homogeneity, washability, stability, and antimicrobial activity. The prepared cream showed good consistency, smooth texture, acceptable pH suitable for topical application, and satisfactory spreadability without phase separation. Stability studies indicated that the formulation remained stable under storage conditions. The cream also demonstrated promising antimicrobial activity against acne-causing microorganisms.

KEYWORDS: Acne vulgaris, Herbal cream, Tinospora cordifolia, Santalum album, Anti-acne activity.

INTRODUCTION

1. Acne

Many people refer the herbal product over the synthetic one, synthetic product produce several harmful side effects compare to the herbal product they have minimal side effects. acne becomes the major problem now a day's in adults , it affects both genders (male and female). An acne is a skin disease which causes painful social and psychological effects on sufferers. It is a problem for adults as well as for many teenagers. The primary factors involved in the formation of acne are increased sebum production, sloughing of keratinocytes, bacterial growth and inflammation. Propionibacterium acnes (P. acnes), an anaerobic pathogen, plays an important role in the pathogenesis of acne by inducing certain inflammatory mediators, the severity of acne can differ significantly from person to person, with genetic factors playing a crucial role.

2. Factors responsible for acne

- Inflammation
- Androgen-induced enhanced sebum hyper-production
- Medications.
- Due to the Cosmetics Used
- Stress
- Hormonal Changes and Menstruation
- Squeezing the Pimples
- Diet
- Genetics

MATERIALS AND METHODS

Collection of plant material

Tinospora cordifolia stem, Santalum album wood were collected from the plants.

Table: 1 Role of ingredients.

Sr. No.	INGREDIENTS	ROLES
1	Tinospora Cordifolia	Antioxidant, reduce acne and pimples
2	Santalum Album	Antioxidant
4	Bees wax	Thickener and improves texture
5	Borax	Alkaline agent
6	Methyl Paraben	Preservative
7	Liquid paraffin	Lubricating agent

8	Ethanol	Penetration enhancer, vehicle
9	Distilled water	Vehicle
10	Rose water	Fragrance

Extraction Processes

i. Tinospora Cordifolia

Fresh and healthy stems of Tinospora cordifolia were collected and washed with distilled water. The stems were shade dried and powdered using grinder about 50 g of powder was mixed with 500 mL ethanol and water mixture (70:30) in a conical flask. The mixture was kept for 48–72 hours with occasional stirring for proper extraction,after extraction, the solution was filtered using muslin cloth and filter paper to remove impurities. The filtrate was heated on water bath below 50°C to obtain concentrated semisolid extract prepared extract was stored in airtight container for further use.

ii. Extraction of Santalum album

Sandalwood powder was collected and cleaned properly. About 10 g of sandalwood powder was mixed with 100 mL ethanol in a conical flask. The mixture was kept for 48 hours with occasional stirring for proper extraction after extraction, the solution was filtered using muslin cloth and filter paper to remove impurities the filtrate was heated on water bath below 50°C to obtain concentrated extract prepared extract was stored in airtight container for further use.

Fig. 1: Filtration.

Preliminary Phytochemical Screening Test

I. Test for Alkaloids

Mayer's Test: The extract was added to Mayer's reagent. Formation of cream/yellow precipitate indicates the presence of alkaloids.

II. Test for Carbohydrates

Molisch Test: 2–3 drops of Molisch reagent were added to the extract followed by concentrated sulphuric acid from the side of the test tube. Formation of violet ring indicates the presence of carbohydrates.

III. Test for Phenolic Compounds

Ferric Chloride Test: Few drops of ferric chloride solution were added to the extract. Formation of blue-green colour indicates the presence of phenolic compounds.

IV. Test for Flavonoids

Shinoda Test: Small amount of magnesium ribbon and concentrated HCl were added to the extract. Formation of pink/red colour indicates the presence of flavonoids.

V. Test for Saponins

Foam Test: The extract was shaken with distilled water for few minutes. Formation of stable foam indicates the presence of saponins.

VI. Test for Glycosides

Keller–Killiani Test: The extract was treated with glacial acetic acid, ferric chloride and concentrated sulphuric acid. Formation of brown ring indicates the presence of glycosides.

Fig. 2: Phytochemical Test.

Table: 2 Preliminary Phytochemical Screening.

SR NO.	Phytoconstituent	Test	Tinospora Cordifolia	Santalum Album
1	Alkaloids	Mayer Test	+	+
2	Carbohydrate	Molisch Test	+	+
3	Phenolics	Ferric Chloride Test	+	+

4	Flavonoids	Shinoda Test	+	+
5	Saponins	Foam Test	+	-
6	Glycosides	Keller Killiani Test	+	+

Formulation of cream

Bees wax and liquid paraffin are taken in a clean beaker and heated at 70–75°C until completely melted.

Borax and methyl paraben are dissolved separately in warm distilled water and heated to the same temperature (70–75°C).

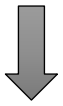
The aqueous phase is slowly added into the oil phase with continuous stirring using mechanical stirrer to form a stable emulsion.

Prepared emulsion is cooled to about 40°C to avoid degradation of herbal constituents.

Tinospora cordifolia extract and Santalum album extract are added slowly with continuous mixing for uniform distribution.

Few drops of rose water are added as fragrance and skin soothing agent.

The cream is homogenized properly until a smooth, glossy and lump-free cream is obtained.



Prepared herbal anti-acne cream is filled into clean airtight containers and stored at cool temperature for further evaluation.

Table: 3 Formulation Table.

Ingredients	**F1**	**F2**	**F3**
Tinospora cordifolia	1ml	1.5ml	2ml
Santalum album	1ml	1ml	1ml
Bees wax	2gm	2gm	2gm
Liquid Paraffin	6ml	5.5ml	5ml

Borax	0.2gm	0.2gm	0.2gm
Methyl Paraben	0.2gm	0.2gm	0.2gm
Rose Water	q.s 20g	q.s 20g	q.s 20g

Fig. 3: Formulation Antiacne Cream.

Evaluation Parameters of developed Formulation

1. Physical Appearance: The Physical appearance of the cream can be observed by its dye, harshness

and graded it is observed Clear.

- ✓ Colour: light brown
- ✓ Odour: Characteristics

3. pH: The pH is cheaking by using pH meter & observed(5.7).

Fig. 4.

3. Spreadability: Acceptable quantity of sample is taken between two glass slides and a load of 100gm is applied on the slides for 5 twinkles.

Spreadability can be expressed as S= m*l/t Where, m= weight applied to upper slide = 100

l= length moved on the glass slide = 4.5

T = time taken = 5 sec 100*4.5 = 90 5

Fig. 5

4. Homogenesity: The formulation was tried for the uniformity by visual appearance and by touch.

5. Washability: Formulation was applied on the skin and also ease prolong of washing with water and checked.

6. Viscosity: Viscosity of cream was done by using Brooke field viscometer at a 20 rpm with the spindle no. LV (64). The Cream shows normal viscosity range that is 48890 cp.

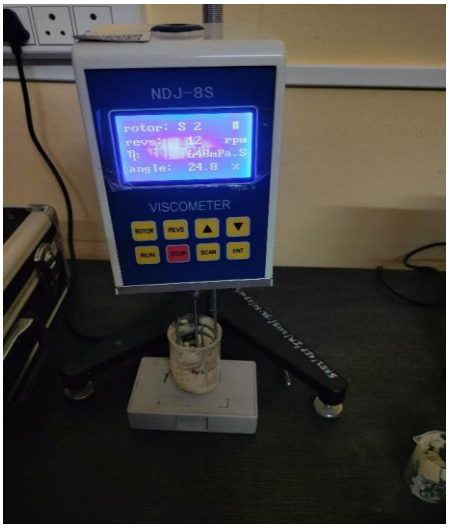


Fig.6

RESULT AND DISCUSSION

The formulation and evaluation of anti-acne cream was carried and the results of the experiment indicates that the F1 formulation had better parameter results as mentioned in the table below.

SR.NO	Test	F1	F2	F3
1	Colour	Light Brown	Light Brown	Creamy White
2	Odour	Characteristics	Characteristics	Characteristics
3	Consistency	Good	Good	Good
4	pH	5.7	5.9	6.1
5	Spreadability	90 g.cm /sec	82 g.cm /sec	76 g.cm /sec
6	Homogenecity	Good	Good	Good
7	Washability	Easy to wash	Easy to wash	Easy to wash

The prepared herbal anti-acne cream showed acceptable physical properties. F1 formulation was light green in colour with characteristic odour and smooth consistency. The pH of F1 was found to be 5.7, which is suitable for skin application. Spreadability of F1 was better than F2 and F3, indicating easy application on the skin. All formulations showed good homogeneity and were easily washable with water. Therefore, F1 was considered as the best formulation**.**

CONCLUSION

The present study concluded that the herbal anti-acne cream containing Tinospora cordifolia and Santalum album was successfully formulated and evaluated. The prepared formulations showed good physical appearance, acceptable pH, good consistency, satisfactory spreadability, homogeneity and easy washability. Among all formulations, F1 showed better evaluation parameters and was found to be the optimized formulation. The herbal ingredients exhibited potential anti-acne activity due to their antimicrobial, anti-inflammatory and antioxidant properties. Hence, the formulated herbal anti-acne cream can be considered safe and effective for the management of acne and skin care.

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