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To prepare and evaluate an anti-acne face wash gel using *Ocimum basilicum* extract

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Abstract

The current aimed to formulate an anti-acne face gel and evaluate the various property. The herbal face gel was formulated by adding the Carbopol 940, Methyl paraben, Propyl paraben, Triethanolamine, Propylene glycol and Sodium lauryl sulphate in different proportions to a 10 gm. Several tests such as visual inspection, color, appearance, consistency, pH, viscosity, spread ability and for Accelerated Stability Studies etc, were performed. The formulated herbal gel was clear and appealing. It showed good cleansing and detergency and good foam stability. The results indicated the formulated gel is having excellent conditioning performance. However, further research and development is required to improve its quality and safety.

Key words: Herbal face wash gel, *Ocimum basilicum,* Methanolic extract, Accelerated Stability Studies

Introduction

Acne is a long-term inflammatory condition of the pilosebaceous unit that results in elevated sebum secretion by the sebaceous glands and aberrant desquamation of hair follicles at the beginning of puberty. The follicular obstruction results in follicular distention, which is frequently accompanied by the growth of Propionibacterium acnes and the induction of a response of inflammation.[1-3] The prevention of ROS (Reactive Oxygen Species) accumulation, inhibition of C. acnes growth, and control of inflammatory cytokine production are the main aims for the development of pharmaceutical anti-acne therapies.[4-7] Ocimum belongs to lamiaceae family (shown in fig 1) used to treat various illness form ancient times. It is also referred to as Saint Joseph's Wort, sweet basil, and great basil. It is a perennial herbaceous plant contains 9-Acetoxynonanal, Paromomycin, Stevioside, D-Limonene, Exo-2,7,7-Trimethylbicyclo[2.2.1]heptan-2-ol, Dithiocarbamate, Linalool , 13,16-Octadecadiynoic acid, methyl ester, 2-Hydroxy-cyclohexanecarboxylic acid ethyl ester, Campesterol, Ethyl iso – allocholate, y-Tocopherol, Octadecanoic acid, Methyleugenol, Methyl 6-oxoheptanoate, Glycyl-D-asparagine, 6-Acetyl-ß-d-mannose in its metahonolic extract and apart from it also possess varies medicinally significant phyto-constituents having analgesic, anti-inflammatory, antimicrobial, antioxidant, hepatoprotective, hypoglycemic, hypolipidemic,

immunomodulatory, anti-carcinogenic and larvicidal effects.[8-12] Out of which anti-inflammatory, antimicrobial and antioxidant properties can be well utilized for treating and preventing Acne vulgaris. The current study is used to formulate and evaluate an anti-acne formulation (gel face wash).

Figure 1. *Ocimum basilicum* plants

Material and Methodology

Herb and Chemicals

Ocimum basilicum leaves were obtained from plants grown in New Delhi, India. Leaves were shade dried and coarsely powdered.

Taxonomy

Kingdom	Plantae
Division	Magnoliophyta
Class	Magnoliopsida
Order	Lamiales
Family	Lamiaceae
Genus	Ocimum
Species	Basilicum
Binomial Name	*Ocimum basilicum*

Chemicals

Carbopol 940 (Carbomer as a gel base), Methylparaben (Preservative), Propylparaben (Preservative), Triethanolamine (Buffer), Propylene glycol (Humectant), Sodium lauryl sulphate (Surfactant), Distilled water and Methanol (For Extraction).

Authentication of Herb

The dried sample of the herb *Ocimum basilicum* was duly authenticated by Dr. Sunita Garg, Former Chief Scientist and Head, RHMD, CSIR-NIScPR and Mr. R.S. Jayasomu, Chief Scientist and Head, RHMD, CSIR-NIScPR (Authentication No.- NISCAIR/RHMD/Consult/2022/4246-47).

Preparation of Herbal Drug Extract

Methanolic extract of the coarsely powdered leaves of *Ocimum basilicum* leaves was prepared by cold maceration technique [13-15]. The herb was soaked in methanol in an airtight flask for 72 hours, filtered it with Whatman No. 1 and filtrate was concerted to one third of the original amount (fig 2 and 3).

Figure 2 and 3: Methanolic extraction of *Ocimum basilicum* leaves by Cold Maceration.

Formulation of *Ocimum basilicum* Face Wash Gel

The following procedure was followed to prepare the desired formulation given below and the composition of the formulation given in the table 1 and fog 4 showing the final gel formulation.[16-18]

Triethanolamine was added dropwise to the distilled water to be used to swell Carbopol to maintain its pH at 7.

Carbopol was swelled in methanolic extract and water along with the preservatives, Methyl paraben and Propyl paraben.

To the swollen Carbopol, Propylene Glycol was added and gently mixed.

SLS (Sodium Lauryl Sulphate) was gently incorporated into the previously mentioned mixture.

Table 1. Composition of face wash gel.

S.No.	**Ingredient**	**Quantity**
1.	Herbal Drug Extract	4
2.	Carbopol 940	2
3.	Methyl paraben	0.1
4.	Propyl paraben	0.1
5.	Triethanolamine	1
6.	Propylene glycol	2.0
7.	Sodium lauryl sulphate	2.5
8.	Distilled water	Q.S.

Figure 4. Final face wash gel formulation

Evaluation of the Face Wash Gel

The prepared face wash gel was assessed for the pH, Odor, color, consistency, grittiness, wash ability, formability, viscosity and spread ability quality control criteria. A digital pH meter was used to determine the pH of the prepared gel, formulation was smelled to determine its odor, for color, color of the formulation assess visually under natural white light [18-21]. Grittiness was determine by applied the formulation on hand and exposed to running water. 1% solution of the gel in water was taken in a graduated cylinder for testing the formability and the initial volume of the solution was noted by shaking it for 10 times. A Brookfield viscometer was used to measure the gel's viscosity. The values of viscosity for the sample and water were recorded. [22-25]

Spread ability

The ability of a formulation to spread over a specific area in a given amount of time was used to gauge its spread ability.

Excess sample formulation was placed between the two glass slides, and then a 100g weight was kept at the slides for a short period of time to compress the sample. The upper slide was fastened with a 20g weight. The spread ability of the formulation was used to calculate how long it took to separate the two slides using the following formula [26].

$$S = M. L / T$$

Where,

S is spread ability, M is weight tied to upper slide, L is the length of glass slide, T is time taken.

Accelerated Stability Studies

The prepared formulation was divided into 3 parts. Out of which, the first part was kept at 25 degrees Celsius (room temperature), the second one at 50 degrees Celsius and the third one at 80 degrees Celsius and then evaluated for the before mentioned parameters. The second and third parts were brought to room temperatures before evaluating [23].

Results

The herbal face wash gel was formulated and evaluated for color, odor, Consistency, pH, Spread ability, Wash ability, Grittiness, Foam ability and obtained results are given into table no.3. Color of formulation was yellow and it showed characteristic odor with semi solid and it is easily pourable from container. pH of formulation was neutral. Formulation showed easy spreadability and it was easily washable. Also it was free from grittiness. However the Foam ability and accelerated stability studies at 25 °C, 50 °C and 80 °C was checked and it shows acceptable results.

Table 2: Evaluation Parameter of the formulation at 25 °C

S.No.	Evaluation Parameter	Results
1.	pH	7.0
2.	Odour	Light aromatic odor of basil extract
3.	Colour	Yellowish-green
4.	Consistency	Smooth gel like consistency
5.	Grittiness	No grittiness
6.	Washability	Easily washable under running water with foaming effect.
7.	Foamability (Volume of foam)	10ml
8.	Viscosity (centipoise)	473
9.	Spreadability (gm.cm/sec)	17

Table 3: Evaluation Parameter of the formulation at 50 °C

S.No.	Evaluation Parameter	Results
1.	pH	7.0
2.	Odour	Light aromatic odor of basil extract
3.	Colour	Yellowish-green
4.	Consistency	Smooth gel like consistency
5.	Grittiness	No grittiness
6.	Washability	Easily washable under running water with foaming effect.
7.	Foamability (Volume of foam)	11ml
8.	Viscosity (centipoise)	470
9.	Spreadability (gm.cm/sec)	17

Table 4: Evaluation Parameter of the formulation at 80 °C

S.No.	Evaluation Parameter	Results
1.	pH	6.79
2.	Odour	Light aromatic odor of basil extract
3.	Colour	Yellowish-green
4.	Consistency	Smooth gel like consistency
5.	Grittiness	No grittiness
6.	Washability	Easily washable under running water with foaming effect.
7.	Foamability (Volume of foam)	9.5ml
8.	Viscosity (centipoise)	480
9.	Spreadability (gm.cm/sec)	15

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Conclusion

Prepared formulation was evaluated for colour, odour, consistency, pH, spread ability, wash ability, grittiness, foam ability studies and it shows acceptable results. Herbal face wash gel containing, Methyl paraben, Propyl paraben, Triethanolamine, Propylene glycol and Sodium lauryl sulphate in different proportions was formulated successfully by using carbapol as a gelling agent. So performed studies it can conclude that prepared formulation may effectively use of formulation are required to perform before to bring it in real use.

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Conflict of Interest

The author declared no conflict of interest

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