

**FORMULATION AND EVALUATION OF GEL CONTAINING NEEM, TURMERIC,
ALOE VERA, GREEN TEA AND LEMON EXTRACT WITH ACTIVATED CHARCOAL
AND HONEY**

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ABSTRACT

The present research has been undertaken with the aim to formulate and evaluate of gel containing Neem (*Azadirachta indica A.Juss, Meliaceae*), Turmeric (*Curcuma longa L., Zingiberaceae*), Aloe (*Aloe vera (L.) Burm.f., Asphodelaceae*), Green tea (*Camellia sinensis (L.) Kuntze, Theaceae*) and Lemon extract (*Citrus limon (L.) Osbeck., Rutaceae*) with activated Charcoal and Honey as a cleansing agent, anti acne and skin nourishing. Natural remedies are more acceptable in the belief that they are suffer with fewer side effects than the synthetic ones. Herbal formulation have growing demand in the world market. The plant have been reported in literature having good antimicrobial, anti-inflammatory, refreshing activity, cleansing agent, dirt absorbent and anti-oxidant. F1 and F2 formulation are prepared by using varied concentration of extract prepared formulation (F1 and F2) where evaluated for various parameters like colour, appearance, consistency, wash ability, pH and Spreadability, Extrudability, skin irritation and compared with marketed formulation.

INTRODUCTION



The skin is the largest organ of the body, accounting for about 15% of total adult body weight. It perform many vital function, including protection against external, physical, chemical and biological assailants, as well as prevention of excess water loss from the body and role in thermoregulation. The skin is continuous, with the mucous membranes lining the body's surface. To keep skin healthy, clear, glossy, a balanced nutrition is






required. Apart from the balanced nutrition, hormonal changes especially during puberty in both sexes cause many changes in the body. Among various changes, dryness, roughness and pimples are most common. The pathogenesis of this are bacterial over growth and inflammation. To overcome this problem the use herbal remedies such as neem, aloe era, green tea, turmeric face wash gel has been formulated.^[1]

MATERIAL AND METHODS

MATERIALS^[2-4]

Table No. 1: List of Drugs.

Sr. No	Ingredients	Skin Benefit	Figure
1.	Neem leaves (<i>Azadirachta indica A.Juss., Meliaceae</i>)	Antibacterial, anti fungal, anti septic.	
2.	Turmeric (<i>Curcuma longa L., Zingiberaceae</i>)	Antibacterial, antifungal, also adds glow to the skin.	

3.	Aloe vera (<i>Aloe vera</i> (L.) Burm.f. , <i>Asphodelaceae</i>)	Moisturising agent, delivers something property to the skin.	
4.	Green tea (<i>Camellia sinensis</i> (L.)Kuntze., <i>Theaceae</i>)	Many scientists believe that free radicals contribute to the aging process as well as the development of a number of health problems. Polyphenols present in green tea helps in anti ageing. Makes your skin looks younger and better.	
5.	Lemon juice (<i>Citrus limon</i> (L.) Osbeck., <i>Rutaceae</i>)	To lighten skin and reduce blemish marks on the skin. It is also quite effective for treating pimples.	
6.	Honey	Light humectants and nutrients used as thickening agent to give body to facial masks, creams and lotions.	
7.	Rose water	Used to mask the odour of extract, also quite effective against acne	


8	Activated Charcoal	Activated charcoal draws bacteria, poisons, chemicals, dirt and other micro-particles to the surface of skin, helping you to achieve a flawless complexion and fight acne.	
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Table No. 2: List of Chemicals.

Sr. No	Chemicals	Name And Address	Uses
1.	Carbapol 940	Merk Ltd.	Gelling agent
2.	Methyl paraben	Fischer scientific India Pvt. Ltd.	Preservative
3.	Propyl paraben	Fischer scientific India Pvt. Ltd.	Preservative
4.	Propylene glycol 400	SD fine chemicals Ltd.	Solubility
5.	Triethanolamine	SD fine chemicals Ltd.	Neutraliser
6.	Sodium lauryl sulphate	SD fine chemicals Ltd	Surfactant
7.	Charcoal	SD fine chemicals Ltd	Absorbing agent

1. Collection

Leaves of neem, aloe vera were collected from a medicinal garden of VIPER Ale, PUNE in the month of September 2017. Honey, lemon juice, turmeric, rose water were collected from local market of Pune. Chemical were collected from store room of college.

2. Preparation of Extract

Leaves of neem, aloe vera, rhizomes of turmeric kept in hot air oven for drying purpose at 45^o C and grinded into small pieces. By using grinder charcoal, green tea were crushed to make powder. Desired quantities of herbal drug were weighed and each herb macerated with water in conical flask. Add rose water and dried herbs were allowed to mix with water by moderate shaking of conical flask for 3 days. After 3 days content were filtered out by using simple filtration method and filtrates were collected in separately vessel.^[5]

Table No. 3: Composition of Extract.

Sr. No.	Name of ingredient	Quantity
1.	Extract of neem	1 g
2.	Extract of aloe vera	2 g
3.	Extract of curcuma longa	2 g
4.	Extract of Green tea	2 g
5.	Charcoal	2 g
6.	Lemon juice	1 ml
7.	Honey	2 ml

3. Filtration

Filtration of extract was done by using simple filter paper and funnel for two times.

4. Evaporation

Evaporation was done by using electronic water bath. Filtrates were allowed to evaporate in evaporating pan at

60^o C temperature until the desired concentration of the extract was obtained.

5. Method of Preparation Of Gel Containing Extract

1 g of carbapol 940 was dispersed in 50 ml of distilled water kept the beaker a side to swell the carbapol 940 to form gel. Take 5ml of distilled water and required quantity of methyl paraben and propyl paraben were dissolved by heating on water bath solution was cooled and propylene glycol 400 and sodium lauryl sulphate added. Further required quantity of extract was mixed to the above mixture and add this solution into the carbapol 940 gel with continuous stirring and add triethanolamine was added dropwise to the formulation for adjustment of required skin pH and to obtain the gel at required consistency.

6. Formulation

As per method described above the formula were tabulated in table 4. Gel were prepared by addition of 1g and 2g of extract to prepared 1% and 2% formulation respectively.^[4-5]

Table No.4: Composition of Developed Formulation.

Sr. No.	Ingredient Name	F1	F2
1.	Extract	1g	2g
2.	Carbapol 940	1g	1g
3.	Methyl paraben	0.2g	0.2g
4.	Propyl paraben	0.1g	0.1g
5.	Triethanolamine	1.2ml	1.2ml
6.	Propylene glycol 400	5ml	5ml
7.	Sodium lauryl sulphate	5g	5g

7. Marketed Formulation

Patanjali neem lemon aloe era face wash.

8. Evaluation Parameters

A. Physical Evaluation

Physical parameters such as colour, consistency were checked manually.

B. Washability

The product was applied on hand was observed under running water.

C. pH

pH of 1% aqueous solution of the formulation was measured by using a calibrated digital pH meter at constant temperature.^[6]

D. Spreadability

500mg of the cream was sandwiched between 2 slides. A weight of 100gm was placed on upper slide. The weight was removed and extra formulation was scrapped off. The lower slide was fixed on board of apparatus and upper slide was fixed with non flexible string on which 20g load was applied. Time taken by upper slide to slip off was noted down.^[7]

E. Extrudability

The gel formulation were filled in standard capped collapsible aluminium tubes and sealed by crimping to the end. The weight of tubes were recorded and the tubes were placed between two glass slides and were clamped. 500gm was placed over the slides and then the cap was removed. The amount of extruded gel was collected and weighed. The percent of extruded gel calculated as

1. When it is greater than 90% then extrudability is excellent.
2. When it is greater than 80% then extrudability is good.
3. When it is 70% then extrudability is fair.^[8]

F. Irritancy Test

The cream was applied on left hand dorsal side surface of 1sq.cm and observed in equal intervals upto 24hrs for irritancy, redness and edema.^[9]

RESULT AND DISCUSSION

The result of evaluation are displayed in table no. 5. Formulation was yellowish green in colour where as marketed formulation was black in colour formulation F1, F2 was found to have semisolid consistency. All formulations were found homogenous easily washable. All the formulation has slightly alkaline pH which was compatible with skin physiology.

Table No.5: Evaluation Parameter.

Formulation Batch	Colour	Consistency	Washability	pH	Extrudability	Spreadability	Skin Irritation
Marketed	Black	Semisolid	Easily Washable	6.15	Good	Good	No sign
F1	Yellowish green	Semisolid	Easily Washable	6.30	Good	Good	No sign
F2	Yellowish green	Semisolid	Easily Washable	6.51	Good	Good	No sign

CONCLUSION

Herbal formulation share growing demand in the world market. It is very good attempt to establish the herbal face wash containing aqueous extracts of neem leaves, turmeric rhizomes, aloe vera, green tea. The plant have been reported in literature having good antimicrobial, anti-inflammatory, refreshing activity, cleansing agent, dirt absorbent and anti-oxidant. F1 and F2 formulation

are prepared by using varied concentration of extract prepared formulation (F1 and F2) where evaluated for various parameters like colour, appearance, consistency, wash ability, pH and Spreadability, Extrudability, skin irritation and compared with marketed formulation. After evaluation study show that both formulation gives good affect as marketed formulation and neither show any side effect or skin irritation.



Fig. No.1,2 And 3: Polyherbal Gel Formulation.

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