

## FORMULATION AND EVALUATION OF ANTI -ACNE HERBAL FACE WASH

**Prity Priya\* (B-Pharm)**

Krishna Institute of Nursing and Para Medical Sciences, Samastipur, Bihar, India.

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**\*Corresponding Author**

**Prity Priya\* (B-Pharm)**

Krishna Institute of Nursing  
and Para Medical Sciences,  
Samastipur, Bihar,  
India.

### ABSTRACT

Natural medicines are safer and have fewer negative effects than the synthetic ones, so these are more acceptable by people. The demand of herbal formulations growing-up in the globe market day by day. The current research work deals with the development & evaluation of the herbal anti-acne face wash containing aqueous extracts of neem leaves (*Azadirachta indica*), liquorice root, shahi jeera, orange peel, turmeric (*curcuma longa*), aloe vera, xanthan gum and rose-water. Although there are various topical herbal formulations for acne in the market, we recommend to make a pure herbal formulation without the use of any synthetic ingredients. The plants having good anti-oxidant, anti-microbial and anti-inflammatory properties, according to published reports. In order to prepare the different formulation batches, i.e., F1 to F4 were prepared using xanthan gum in different concentration. The prepared formulation on a various parameter, including appearance,

color, consistency, pH, washability and spread ability. All the batches of formulation were compared with the marketed preparation. Amongst which batch F2 was shown to be the best for all the parameters. The herbal formulation of Neem leaves, Turmeric and Aloe vera in its aqueous extract was an attractive successful attempt.

**KEYWORDS:-** Neem, Aloe Vera, Herbal Ingredients, Xanthan Gum, Anti-Acne Face Wash.

### INTRODUCTION

Acne vulgaris is a (Skin disorder or follicular unit) common cutaneous inflammatory disorder of the pilosebaceous unit, which runs a chronic course. It is commonly triggered during adolescence by cutibacterium acnes, a bacterial species under the influence of normal circulating levels of dehydroepiandrosterone.

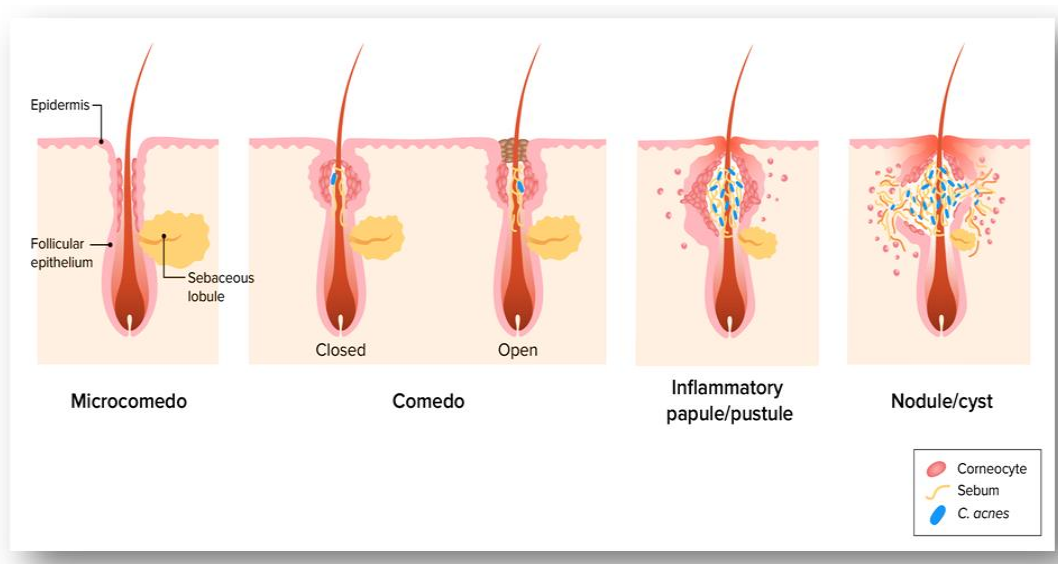
Acne are five types such as:- Comedogenic, Pustular, Cystic and Nodular.

Comedonal acne is divided into two types: whiteheads and blackheads, these are non-inflammatory. Whiteheads look as cool or white lumps, while blackheads look as open pores with dark-skin roughness made up of melanin, sebum and hair follicle cells.

Papules are often smaller than 5mm in diameter and it is tender, look as red or pinkish bumps. Pustules are pus-filled bumps with white or yellow tips. Nodules and cysts are elevated, solid lesions that affect the subcutaneous tissue and deeper dermis. Nodules are large, painful lesions that can cause aggressive scarring.

#### They can have four different mechanism

- Control of sebum production
- An antibiotic that inhibits *Propionibacterium* and *Staphylococcus epidermidis*, the main bacteria responsible for acne.
- A keratolytic that removes the keratin layer and prevents the trapping of sebum from getting stuck under the skin.
- Anti-inflammatory effect, which can prevent deterioration of the condition caused by inflammation or redness, etc.



#### Anatomy of skin

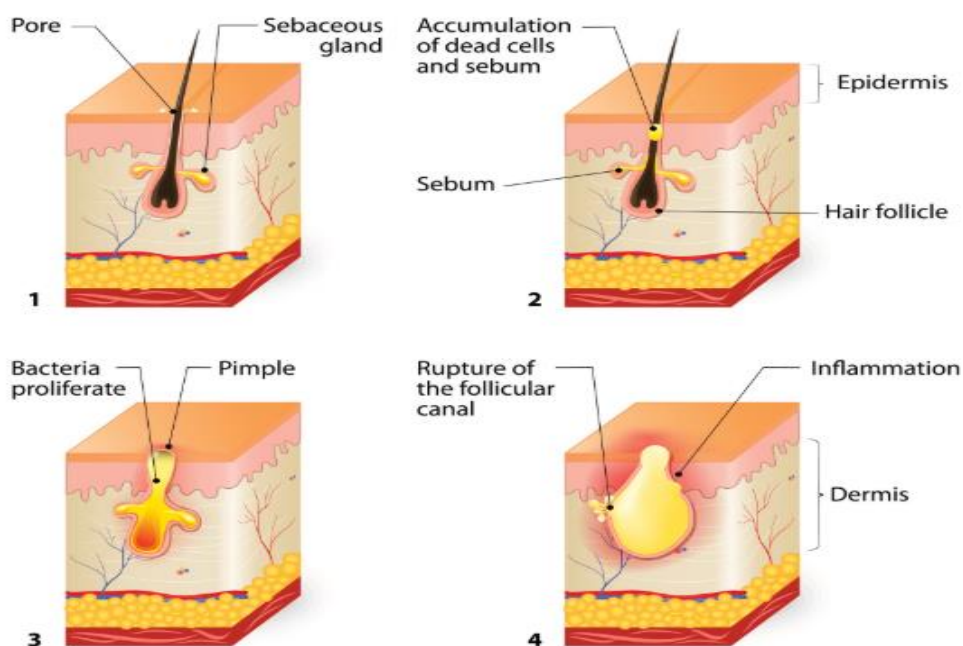
Skin is the largest organ of the body and the covered of our whole external structure. In average human adult the surface area of the skin =may be approximately 20,000 sq cm and weight 4 kg.

**Skin consists of three different layers**

- Epidermis
  - Dermis
  - Hypodermis/subcutaneous
- Epidermis or outer-surface of the skin varies in thickness from 0.16 mm on the eyelid 0.8 mm on the palms and the soles.

**Epidermis is further divided into five layers**

- 1) Stratum corneum (Protect and Cooling transfer)
- 2) Stratum lucidum (Barrier zone)
- 3) Stratum granulosum (Granular layer) [It acts as a barrier to the transfer of water across the skin.]
- 4) Stratum spinosum (Prickle cell layer)
- 5) Stratum germinativum (Basal cell layer)

**ACNE FORMATION****Face wash**

A face wash, a product specifically created for facial cleanliness – stands in contrast to traditional soap. It aids in pore cleaning and the prevention of skin condition like acne.

**Types of face wash**

Face washes come in varieties to accommodate varied skin types and issues. Here are a few types of face wash-

- I. Gentle cleanser
- II. Foaming cleanser
- III. Exfoliating cleanser
- IV. Acne-fighting cleanser
- V. Hydrating cleanser
- VI. Charcoal cleanser
- VII. Oil-Based cleanser

**Benefits of face wash**

- Effective Cleansing
- Balanced pH
- Improved Skin Texture
- Reduced Acne
- By replenishing the skin's moisture barrier, hydrating face cleansers help stop dryness and flakiness
- Makeup Removal
- Preventing skin conditions
- Enhanced Absorbance
- By eliminating dull and dead skin-cells, exfoliating face washes helps to create a complexion that is more vibrant and brighter.

**Disadvantages of face wash**

- Skin irritation
- Allergic reaction
- Skin dryness
- Over-scrubbing can open up your pores making your skin more prone to infections and tanning.
- Skin barrier disruption
- Sometime reddening, peeling, burning.

## MATERIALS

**Table 1: List of ingredients.**

S. No.	Ingredients	Uses
1.	Turmeric	Antibacterial, antifungal and it protects the skin from many skin infections and also adds glow to the face.
2.	Neem leaves	Antifungal, antibacterial, anti-inflammatory, antiseptic and highly beneficial for oily and acne prone skin.
3.	Nutmeg seed	Antiseptic, bactericide, anti-inflammatory, antibacterial.
4.	Liquorice root	Delivers valuable soothing properties to the skin.
5.	Lemon juice	To lighten skin and reduce blemish marks on the skin. It also quite effective for treating acne and pimples. It is natural pH adjuster in cosmetics.
6.	Xanthan gum	A gum produced by the pure culture fermentation of a carbohydrate also called corn sugar gum. It is used as a non-toxic thickener and stabilizer.
7.	Glycerine	Hydrates the stratum corneum of the skin. Provides anti-irritant protections to the skin. Improves the skin barrier function.
8.	Raw Honey	Deeply hydrates skin, cleans pores, lightens scars, Helps fight bumps, Helps reduce wrinkles.
9.	Rose water	Balances natural oils in the skin, Natural hydration remove impurities and prepare your skin for success.
10.	Aloe vera	It soothes rashes and sunburns by cooling, antioxidant property, anti-inflammatory properties.

### Methods of herbal face wash preparation

#### 1.) Collection

Firstly, we collect the leaves of neem, fruits of nutmeg and liquorice root, rose water, lemon juice, turmeric, honey aloe vera etc.

#### 2.) Preparation of extracts

After collection of all ingredients, we put leaves of neem, roots of liquorice, rhizomes of turmeric lemon juice were kept in hot air oven for drying purpose at 40°C and grinded into small pieces by using grinder.

Seeds of nutmeg and aloe vera were crushed to make powder and gel respectively.

Now, desired quantities of herbal drugs were weighed and each herb macerated with rose water in conical flask for 3 days separately. After 3 days, contents were filtrated out by using simple filtration method and filtrates were collected in vessels separately.

### 3.) Filtration

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

### 4.) Evaporation

Filtrates were allowed to evaporate in evaporating pan at 60-70°C temperature until the desired concentration of the extract was obtained.

- The concentrated herbal extracts were added to the left-over rose water and gently combined with the honey mixture above.
- At the end, formulations were prepared poured into the appropriate container and perform evaluation test.

**Table 2:- Composition of herbal face wash.**

S. N.	Ingredients	Quantity			
		F1	F2	F3	F4
1.	Aloe vera	0.3 gm	0.5 gm	0.7 gm	0.9 gm
2.	Turmeric oil	0.05 ml	0.1 ml	0.15 ml	0.2 ml
3.	Neem	0.5 gm	0.5 gm	0.5 gm	0.5gm
4.	Nutmeg	0.5 ml	0.25 ml	0.5 ml	0.25 ml
5.	Liquorice extracts	0.25 ml	0.25 ml	0.25 ml	0.25 ml
6.	Lemon juice extract	0.05 ml	0.05 ml	0.05 ml	0.05 ml
7.	Xanthan gum	0.05 gm	0.1 gm	0.15 gm	0.2 gm
8.	Honey	0.5 ml	0.5 ml	0.5 ml	0.5 ml
9.	Glycerine	0.1 ml	0.1 ml	0.1 ml	0.1 ml
10.	Rose water	q.s	q.s	q.s	q.s

### Evaluation of formulation

#### 1.) Physical evaluation

Physical characteristics like colour, pH, look and uniformity were visually assessed.

#### 2.) pH

A calibrated digital pH meter was used to measure the pH of the formulations 1% aqueous solution at a fixed temperature.

#### 3.) Washability

Formulations were applied on the skin & then clean or wash with water were checked manually.

#### 4.) Grittiness

By applying of the products on the skin had checked for the presence of any gritty particles.

### 5.) Spread ability

A ground glass slide was mounted on the wooden block. After that 2 gm of the prepared gel was put on this ground slide. Thereafter, a second glass slide with the same dimensions as the fixed ground slide and the gel preparation. For five minutes, a weight of 500 mg was placed on the top of two slides to remove air and produce a homogeneous gel film between them. A specified amount of weight was added to the pan, which was connected to the pulley. The top slide's time (in sec) needed to travel a distance of 5 cm was recorded.

Spread ability was calculated by using the following formula :-

$$S = M \times L / T$$

Where, S = Spread ability

M = Weight tied to the upper slide (20 gm)

L = Length of the glass (6.5 cm)

T = Time in second

## RESULT AND DISCUSSION

The prepared formulations underwent satisfactory results tests for colour, smell, consistency, pH, spread ability, washability and grittiness. Moderately, the batch F2 formulation was more spreadable than F1, F3 and F4 batches.

**Table 3: Physical examination of formulations**

S. N.	Physical parameters	inference		
		F1	F2	F3
1.	Color	Slightly green	Slightly green	Slightly green
2.	Odour	Pleasant	Pleasant	Pleasant
3.	Appearance	Translucent	Translucent	Translucent
4.	Feel on application	Smooth & slipper	Smooth & slipper	Smooth & slipper

**Table 4: Evaluation of formulations.**

Formulation	pH	Grittiness	Spreadability coefficient	Washability	Consistency
F1	4.9	No gritty particle	4.193	Good	Semisolid
F2	5.3	No gritty particle	5.415	Good	Semisolid
F3	5.4	No gritty particle	2.6	Good	Semisolid
F4	4.9	No gritty particle	2.826	Good	Semisolid

## CONCLUSION

In the preparation of herbal face-wash four formulations were prepared and evaluated on the basis of their physiochemical properties like color, grittiness, consistency, washability, pH, odour and spread ability.

The formulation was contained herbal ingredients like Neem Nutmeg, Aloe vera, Lemon juice, Turmeric extract, Rose water and Xanthan gum.

From the evaluation studies it was concluded that the developed herbal formulation of batch F2 was more acceptable than the F1, F3 and F4 batches.

## REFERENCE

1. Indian pharmacopoeia, peppermint oil, 2014; 3253.
2. Indian pharmacopoeia, Neem, 2014.
3. Handbook of pharmaceutical excipients, editions by Raymond C Rawe, Paul j Sheaskey and Marin E Quinn, 764: 6.
4. World Journal of Pharmaceutical Research, 9, 5: 2541-2557
5. World Journal of Pharmacy & Pharmaceutica Sciences, 5, 6: 2001-2007
6. Aloe vera: Development of gel extraction process for Aloe vera leaves December publisher Lambort Academic Publication, 2012.
7. C. K. kokate, a. p. purohit, s. b. gokhle pharmacognosy Nirali Prakashan, 58: 10-12
8. R phate Human Anatomy and Physiology: "The skin" career publication, 2001; 1: 241-246.
9. Harsharan pal singh, Anti-acne synergistic herbal face wash gel, world journal of pharmaceutical research, 2015; 1261-1273.
10. Sowmya K. V, Darsikaet. A, A Research, 9, 5: 2541-2546.
11. Aburijai T, Natesh F. M., plants used in cosmetics, phytother. Res, 2003.
12. Chopra R. N., Nayer S. L., Chopra I.C. edition council of scientific and Industrial Research, New Delhi, 1992; 3.
13. Rashmi MS., Topical gel; A review, Pharm Rev, 2008.