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FORMULATION AND EVALUATION ON HERBAL ANTI ACNE FACE WASH

Ms. Sakshi Hari Sirsat[1], Dr. Swati Rawat[2], Dr. Sunil S. Jaybhaye[3]
Ms. Pooja Ambhure[4], Ms. Ashwini Shelke[5]

[1]Student of Bachelor of Pharmacy, Institute of Pharmacy, Badnapur, Jalna.
[2]Departmet of Principal, Institute of Pharmacy, Badnapur, Jalna.
[3]Department of Quality Assurance, Institute of Pharmacy, Badnapur, Jalna.
[4]Department of Pharmaceutics, Institute of Pharmacy, badnapur, Jalna.
[5]Department of Faculty, Institute of Pharmacy, Badnapur, Jalna.

ABSTRACT

Natural remedies are more acceptable in the belief that they are safer with fewer side effects than the synthetic ones. Herbal formulations have growing demand in the world market. The present work deals with the development & evaluation of the herbal anti-acne face wash containing aqueous extract of neem leaves (Azadirachta indica), turmeric (Curcuma longa), liquorice root, shahi jeera, orange peel & hydro alcoholic extract of fruit of nutmeg (Myristicafragrance). Although various topical herbal formulations for acne are available in the market, we propose to make pure herbal formulation without using any synthetic ingredient. The plantshave been reported in literature having good anti-microbial, anti-oxidant & anti-inflammatoryactivity. Various formulation batches i.e., F1 to F5 were prepared using xanthum gum in variedconcentrations. Prepared formulations (F1 to F5) were evaluated for various parameters like colour, appearance, consistency, washability, pH & spreadability. Optimized batch of formulation was compared with the marketed preparation. Amongst all the formulation studiesbatch F2 was found optimum for all the parameter. It was very good attempt to establish the herbal anti-acne face wash containing aqueous extract of neem leaves, turmeric rhizomes & fruits of nutmeg.

KEYWORDS: *Neem, Xanthan gum, herbal ingredients, anti-acne face wash.*

INTRODUCTION

Acne vulgaris is a common skin disorder that affects almost everyone at least once in their lifetime. It is classified into five types: comedonal, papular, pustular, cystic, and nodular acne. Comedonal acne is non-inflammatory and consists of two types: whiteheads and blackheads. Whiteheads appear as white-colored, raised bumps, while blackheads appear as open pores containing dark-colored skin debris made up of melanin, sebum, and follicular cells.Papules are red, solid, elevated lesions that are usually less than 5mm in diameter. Pustules areskin elevations containing purulent material. Cysts and nodules are solid, elevated lesions thatinvolve deeper dermal and subcutaneous tissues. Cysts are less than 5mm in diameter, while nodules exceed 5mm.

The pathogenesis of acne involves multiple physiological factors such as follicular hyper-proliferation, increased sebum production due to higher androgen levels, and colonization of organisms like Propionibacterium acnes and Staphylococcus epidermidis. Recent research hasshed light on various other factors like variation in target cell sensitivity, biological markers, neuro-endocrine, genetic, and environmental factors, which play a role in the pathogenesis of acne.

There are several herbal and synthetic ingredients that have shown remarkable beneficial effects on acne vulgaris. These ingredients may act through various mechanisms such as controlling sebum secretion, inhibiting Propionibacterium acne and Staphylococcus epidermidis, removing the keratin layer, and preventing inflammation or redness. Manyformulations are available in the market with a variety of active pharmaceutical ingredients forthe treatment of acne. Topical formulations such as gels, creams, and lotions are commonly used for treating acne.

- **TYPES OF ACNE**

➢ **Acne Vulgaris**

Acne vulgaris is the medical name for common acne -- the presence of blackheads, whiteheads, and other types of pimples on the skin. The most common spots for breakouts arethe face, chest, shoulders, and back. Although mild acne may improve with over-the-counter treatments, more severe forms should be treated by a dermatologist.

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- **Nodules**

Nodules are large, inflamed bumps that feel firm to the touch. They develop deep within the skin and are often painful. Nodules should be treated by a dermatologist since they can scar.Over-the-counter treatments may not be powerful enough to clear them up, but prescription drugs can be effective.

- **Mild Acne**

Acne falls into the "mild" category if you have fewer than 20 whiteheads or blackheads, fewer than 15 inflamed bumps, or fewer than 30 total lesions. Mild acne is usually treated withover-the-counter topical medicine. It may take up to eight weeks to see a significant improvement

- **Cysts**

Cysts are large, pus-filled lesions that look similar to boils. Like nodules, cysts can be painfuland should be treated by a dermatologist since they also can scar. People who develop nodulesand cysts are usually considered to have a more severe form of acne.

- **Pustules**

Pustules are another kind of inflamed pimple. They resemble a whitehead with a red ring around the bump. The bump is typically filled with white or yellow pus. Avoid picking or squeezing pustules. Picking can cause scars or dark spots to develop on the skin.

❖ **BENEFITS**

1. Cleanses the face. Cleansing is the first step on the ladder of CTM.
2. Hydrates the skin.
3. Slows down signs of premature aging.
4. Treats acne.
5. Stimulates blood circulation.
6. Helps other product to penetrate properly into the skin.
7. Deals with multiple skin issues.

AIM

The Aim of formulation is to formulate, evaluate the herbal anti-acne facewash.

- **OBJECTIVES**

1. To develop a purely herbal formulation for acne treatment that does not contain any syntheticingredients.
2. To evaluate the efficacy of the herbal formulation in treating acne and reducinginflammation.
3. To identify the optimal concentrations of natural ingredients that provide the best anti-acneeffect.
4. To assess the safety of the herbal formulation by conducting toxicity studies and ensuringthat it does not cause any adverse effects.
5. To compare the efficacy of the herbal formulation with that of the commercially availablesynthetic products for treating acne.
6. To establish the herbal formulation as a safe, effective, and affordable alternative to syntheticproducts in the market.
7. To provide a natural skincare solution that is accessible to a wide range of people, includingthose who prefer using natural remedies or are sensitive to synthetic products.

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PLAN OF WORK

- **Literature Survey/Review**

1. Review of literature for selection of topic.
2. Searching of ingredients for project work



Procurement Of Ingredients.(Physical Characterisation)



Formula Selection



Formulation/Preparation of Herbal Facewash



Evaluation



Outcome/Conclusion



Report Writing and Submission

METHODOLOGY

A) Selected ingredient for formulation of Herbal Facewash:

1. Ashwagandha
2. Turmeric
3. Nutmeg Seed
4. Liquorice Root
5. Honey
6. Shahi Jeera
7. Lemon Juice
8. Xanthan Gum
9. Orange Peel Extract
10. Rose Water

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1) Ashwagandha

1. Ashwagandha is an evergreen shrub that grows in Asia and Africa. It is commonly usedfor stress. There is little evidence for its use as an "adaptogen."
2. Ashwagandha contains chemicals that might help calm the brain, reduce swelling, lower blood pressure, and alter the immune system.
3. Since ashwagandha is traditionally used as an adaptogen, it is used for many conditionsrelated to stress. Adaptogens are believed to help the body resist physical and mental stress. Some of the conditions it is used for include insomnia, aging, anxiety and manyothers, but there is no good scientific evidence to support most of these uses. There is also no good evidence to support using ashwagandha for COVID-19.

- **Uses**

1. One of the most noticeable benefits of Ashwagandha for skin include its ability to reduce acne, since it is anti-bacterial and anti-inflammatory in nature.
2. Ashwagandha deeply cleanses the skin tissue of its impurities and removes residual dirtand grime from the face.



2) Turmeric

1. Turmeric is a common spice that comes from the root of Curcuma longa. It contains a chemical called curcumin, which might reduce swelling.
2. Turmeric has a warm, bitter taste and is frequently used to flavor or color curry powders, mustards, butters, and cheeses. Because curcumin and other chemicals in turmeric might decrease swelling, it is often used to treat conditions that involve pain and inflammation.

- **Uses**

1. It helps you fight pimples and blemishes and keeps your skin clear, glowing and pimple- free.
2. The turmeric's anti-inflammatory properties can help to avoid pore clogging and soothe your skin



3) Nutmeg Seed

a. NUTMEG Botanical name - Myristica Fragrans
b. Part used - Dried Kernels of seeds
c. Family - Myristicaceae
2. THE IMPORTANT CONSTITUENTS IN NUTMEGS ARE:

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a. Myristicin b. Elemicin c. Eugenol d. P-cymene e. Phytosterin f. Amyolodextrin

- **Uses**

1. Helps in fading blemishes, gives a radiant spotless skin.
2. Reduces the wrinkes, fine lines and calms the skin



4) Liquorice Root

1. Synonyms:-Glycyrrhiza; Liquorice root; Glycyrrhizae radix.
2. Biological Sources:- Liquorice is the dried, peeled or unpeeled, roots, rhizome or stolonof Glycyrrhiza glabra Linn.
3. Family:-Leguminosae.
4. Geographical Source: Liquorice is grown in the sub-Himalayan tracts and Baluchistan.It is cultivated on a large scale in Spain, Sicily and Yorkshire (England)

- **Uses**

1. Licorice is said to have a soothing effect on skin and helps to ease inflammation.
2. The glycyrrhizin found in licorice can reduce redness, irritation and swelling, and isused to treat skin conditions like atopic dermatitis and eczema.



5) Honey

1. Synonyms: Madhu,
2. Biological Source: Honey is a sugar secretion deposited in honey comb by the bees.
3. Family Apdae, order Hymenoptera.
4. Geographical Source: Honey is produced in Africa, Australia, New Zealand, Californiaand India.
5. Colour: pale yellow to yellowish brown
6. Odour: Characteristic, pleasant
7. Chemical Constituents: • Honey is aqueous solution of glucose 35%, fructose 45%, andsucrose about 2%



6) Shahi Jeera (Cumin)

1. The cumin includes antibacterial, antimicrobial, and anti-inflammatory properties that canhelp calm the skin and keep it free of blemishes.
2. Cumin's essential oils can help tone the skin and increase blood flow and circulation. Thisnatural ingredient can also be used as a great exfoliator, so it's a win-win.

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7) Lemon Juice Extract

Lemons contain antibacterial properties (which is why the juice is a great cleanser), helpingfight the bacteria agents causing your breakouts. It also acts as a natural exfoliator — removing dead skin cells that can clog your pores — as well as a great oil-eliminator.

- **Uses**

1. Lemon juice naturally contains vitamin C, an antioxidant that may help reduce skin damage and premature aging.
2. Due to its high pH levels, lemon can decrease oil on the skin and reduce inflammation.
3. Antifungal.
4. Skin lightening.



8) Xanthan Gum

1. It works to efficiently thicken the foam without jeopardizing it.
2. Xanthan gum is a substance used in making some foods and medications. It has different effects in these products: It can add thickness, keep textures from changing, and hold ingredients in place

- **Uses**

It is used as an emulsifier too.



9) Orange Peel Extract

1. Vitamin C in the peels helps cleanse your skin deeply and unclogs pores by removingexcess oil and grime.
2. Regularly using orange peel powder can help you prevent unpleasant skin breakouts,blackheads, acne, and even reduce existing blackheads or acne

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10) Rose Water

1. Cool and refreshing, rose water for skin contains anti-inflammatory and antibacterialproperties that help reduce redness and acne.
2. It is also known to help soothe major skin care issues like eczema or rosacea.

- **Uses:**

1. Rose water has been used as a beauty product for thousands of years, so it's no surprisethat it can improve your complexion and reduce skin redness.
2. The antibacterial properties may help reduce acne.
3. The anti-inflammatory properties can reduce skin redness and puffiness.



B]FORMULA

Sr.no	Ingredients	Quantity taken for 10g gel				
		F^1	F^2	F^3	F^4	F^5
1	Ashwagandha Extract	0.5 ml	0.5 ml	0.5 ml	0.5 ml	0.5 ml
2	Turmeric Extract	0.2 ml	0.25 ml	0.5 ml	0.25ml	0.2 ml
3	Nutmeg Extract	0.5 ml	0.5 ml	0.25ml	0.2 ml	0.25ml
4	Orange Peel Extract	0.2 ml	0.2 ml	0.25ml	0.2 ml	0.2 ml
5	Liquorice Extract	0.2 ml	0.25ml	0.25ml	0.2 ml	0.25ml
6	Shahi Jeera Extract	0.2 ml	0.2 ml	0.2 ml	0.2 ml	0.2 ml
7	Lemon Juice Extract	0.2 ml	0.2 ml	0.25ml	0.2 ml	0.2 ml
8	Honey	0.5 ml	0.5 ml	0.5 ml	0.5 ml	0.5 ml
9	Xanthan Gum	0.1 mg	0.15ml	0.2 ml	0.2 ml	0.15ml
10	Rose Water	q.s	q.s	q.s	q.s	q.s

C] PROCEDURE

1. Herbal extracts maceration. Method by be prepared by maceration method.
2. All extracts are Filtered clearly & stored in suitable containers.
3. Desired quantity of gelling agent i.e. xanthan gum weighed accurately.
4. Transfer this xanthan gum powder in a beaker &allow to mix in water with continuousstirring. (completely gel mixture were formed)
5. The desired quantity of ashwagandha &turmeric extract dissolved in lemon juice andhoney.
6. Desired quantity of other herbal extracts were added in mixture of xanthan gum withcontinuous stirring.

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7. Add rose water in that formulation in sufficient quantity.
8. The prepared formulation were filled in a suitable container & label accordingly.

EVALUATION TEST FOR FACE WASH

1. **Physical evaluation:** Physical characteristics like colour, look, and uniformity werevisually assessed.
   Colour: yellowish.
2. **Determination of pH:** A calibrated digital pH meter was used to measure the pHof the formulation's 1% aqueous solution at a fixed temperature.
   PH: 4.8
3. **Grittiness:** The product was checked for the presence of any gritty particles by applying it on the skin.
4. **Spreadability:** On the wooden block a ground glass slide was mounted. On this ground slide, 2 gram of the prepared gel was put. Thereafter, a second glass slide with the same dimensions as the fixed ground slide was sandwiched between this slide and the gel preparation. The hook is provided on the second glass slide. For five minutes, aweight of 500 mg was placed on top of the two slides to remove air and produce a homogenous 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 adistance of 5 cm was recorded [25].
   Spreadability was calculated by using the following formula,$S=M\times L/T$
   Were, S- Spreadability
   M- Weight tied to the upper slide (20gm).L- Length of the glasss (6.5cm).
   T- Time in sec.
5. **Washability:** The product will be painted by hand and was observed under runningwater [25

RESULT AND DISCUSSION

The findings from the evaluation are presented in Table 2. The prepared formulation had an orange color while the marketed formulation had a green color. Formulations F1, F2, F3, and F4 were observed to have a semi-solid consistency. All the formulations were found to be uniform and easily washable. Moreover, all formulations had a slightly alkaline pH which wasfound to be compatible with the normal physiology of the skin.

Formulation/ Batch(Code)	Colour	Consistency	Washability	pH	Spreadability (gm-cm/sec)	Viscosity (cP)
Marketed	Green	Semi-Solid	Good	5.8	5.909	1475
F^1	Yellow	Semi-Solid	Good	4.9	4.193	1490
F^2	Yellow	Semi-Solid	Good	5.3	2.6	1535
F^3	Yellow	Semi-Solid	Good	5.4	5.416	1620
F^4	Yellow	Semi-Solid	Good	4.9	2.826	1412
F^5	Yellow	Liquid	Good	4.6	4.642	1540

CONCLUSION

The use of natural remedies is gaining popularity due to the belief that they are safer and have fewer side effects than synthetic ones. Herbal formulations, in particular, have a growingdemand in the world market. The development of a herbal face wash containing aqueous extracts of Ashwagandha leaves, turmeric rhizomes, liquorice root, and nutmeg seeds is a commendable effort. The study showed that batch F3 of the developed herbal formulation wassuperior to the other formulations.

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