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FORMULATION AND EVALUATION OF UBTAN SCRUB FACE WASH

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ABSTRACT

The aim of the present study is to formulate, evaluate, and comparatively assess an herbal scrub face wash for topical application. The primary objective is to develop herbal scrub formulations using suitable excipients and optimized formulation variables, and to evaluate them. The prepared formulations were assessed for physicochemical parameters such as appearance, pH, viscosity, spread ability, and washability. Additionally, the exfoliating efficiency and skin irritation potential of the formulated herbal scrubs were evaluated. Herbal body scrubs are popular natural skincare products made from botanical ingredients such as herbs, plant extracts, and natural exfoliant (e.g., Walnut shell powder, Ubtan powder, neem extract, Vitamin E, Glycerine)designed to exfoliate the skin. Formulated batches were evaluated for various parameters, and it was observed that it shows a good results. When compared with the marketed product, the formulated batch showed better performance. Hence, it can be concluded that the formulated batches exhibited superior results compared to the marketed formulation. The study concluded that the prepared herbal face scrub can be effectively used for cleansing, exfoliation, and improving skin texture naturally without producing harmful effects on the skin. Formulation of Evaluation of Herbal Face Scrub.

KEYWORD: Herbal Scrub, Anti-oxidant, Anti-microbial, and Less Abrasive, skin Exfoliate, Skincare.

1. INTRODUCTION

1.1 SKIN

The skin is considered the largest organ of the body and has many different functions. It is essential for immunity, protecting the body from pathogens and preventing excessive water loss. It also provides insulation, helps regulate body temperature, enables sensation, and supports vitamin D synthesis. Healthy skin plays an important role in maintaining overall physical appearance and confidence. However, due to continuous exposure to environmental pollution, sunlight, stress, unhealthy diet, hormonal imbalance, and improper skincare practices, the skin becomes rough, dull, dry, oily, and prone to various skin problems such as acne, blackheads, pigmentation, and premature aging. The skin continuously produces new cells while old and dead skin cells accumulate on the outer surface. If these dead cells are not removed properly, they block skin pores and lead to dull appearance, acne formation, and uneven skin texture. Therefore, regular cleansing and exfoliation are essential for maintaining healthy, smooth, and glowing skin. Skincare products such as cleansers, moisturizers, lotions, face washes, masks, and scrubs are commonly used to maintain skin hygiene and appearance. Among these products, face scrubs are highly useful because they help remove dead skin cells and impurities from the skin surface through the process of exfoliation.[1]

Structure and functions of Skin

Anatomy of skin

The integumentary system is the body's largest organ and includes the skin, hair, nails, and glands. The epidermis renews itself with new cells roughly every 28 days and is about 0.05 to 0.1 mm thick. In terms of surface area, skin is the second largest organ, making up about 16% of total body weight and covering approximately 1.5–2 m^2 or 17.5 sq ft.[2]

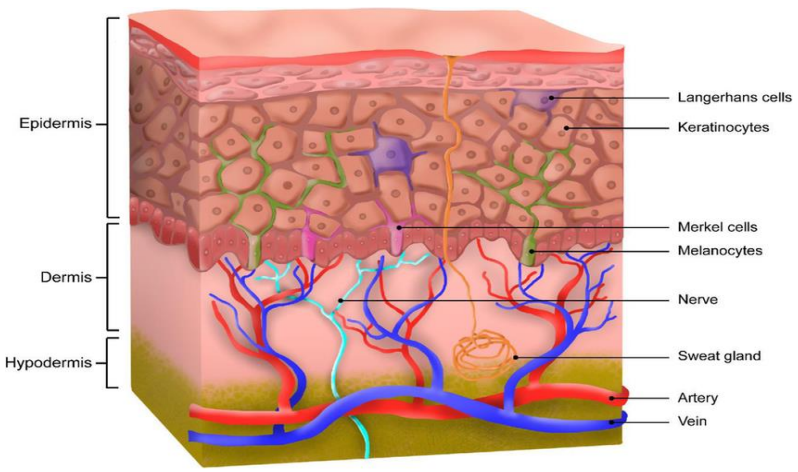

Fig. no. 1: Anatomy of Skin.

Its main layers are: A) Epidermis, B) Dermis, and C) Subcutaneous tissue

A) Epidermis: The epidermis is the outermost layer of the skin. It acts as a protective barrier against dust, microorganisms, and harmful chemicals. It also contains melanin pigment responsible for skin colour. Dead skin cells accumulate in this layer and need to be removed regularly for healthy skin appearance.[3]

B) Dermis: The dermis lies beneath the epidermis and contains blood vessels, nerves, hair follicles, sweat glands, and sebaceous glands. It provides strength, elasticity, and nourishment to the skin.[3]

C) Hypodermis (Subcutaneous Layer)

The hypodermis is the deepest layer of the skin and consists mainly of fat and connective tissues. It helps in insulation, energy storage, and protection of internal organs.[3]

Functions of Skin

The major functions of skin include:

- Protection against harmful substances and microorganisms
- Regulation of body temperature
- Prevention of water loss
- Sensory function such as touch and pain sensation
- Excretion of sweat and waste products
- Maintenance of body appearance and beauty
- Synthesis of Vitamin D

1.2 Introduction to Cosmetics

The word "cosmetic" obtained from the word "cosmos," which is derived from the Greek word "kosmos," which means "order" or "ornament." The word "cosmetic," which refers to the outward look, has come to have a second connotation. They concentrate on maintaining the 'appearance' of the external body surfaces, such as the skin, hair, and teeth, as well as deodorizing or perfuming them to eliminate odours. Changing the appearance of these surfaces, safeguarding them, and maintaining their integrity, or, as in the other sense of "kosmos," keeping them in good "order," are also included in definitions.[4]

These kinds of products are also known as quasi-drugs & they should not be made to alter the

body's structure or functions; rather, they should be used to treat physical ailments rather than to prevent and treat disease. Since cosmetics and quasi-drugs are frequently used daily for extended periods, side-effect-free safety is of utmost importance, and they must be completely side-effect-free. In terms of use, intent, and effects, cosmetic & quasi-drugs differ significantly from pharmaceutical drugs.[4] Cosmetics are products used to cleanse, beautify, protect, and improve the appearance of the body, especially the skin, hair, nails, and face. Cosmetic products are widely used for personal hygiene and beauty enhancement.[4]

HISTORY

The history of cosmetics is present for at least 7000 years and it exists in almost every society around the world. The earliest form of human cosmetic rituals should be body art that includes cosmetics. Cosmetics were not welcome in Rome, but they were used it some aristocratic Romans of the time. It was found that some Romans invented cosmetics in ancient times for example, Kohl used to cover their eye lining.[5] In 1888, a deodorant intended for cosmetic purposes was discovered anonymous American and was marketed trade name- “Mum”. Below Even after 1900 AD, people did not accept cosmetics. Roll-on deodorant and aerosol deodorant were introduced to the market in 1952 and 1965. Russian ballet and colourful makeup were performed around the same time in 1910. It should be noted that the year was started by the current cosmetic manufacturer’s production around the beginning of the 20th century).[6]

Common cosmetic products include

- Face wash
- Creams
- Lotions
- Face packs
- Face scrubs
- Moisturizers
- Sunscreens
- Scrub Face wash

Cosmetic products may be synthetic or herbal in nature. Synthetic cosmetics contain chemical ingredients that may cause skin irritation, allergies, dryness, and long-term side effects. Due to increasing awareness regarding natural skincare, people are now shifting toward herbal cosmetic products because they are safer and more skin-friendly.

1.3 Introduction to Scrub Face Wash

Scrub Face wash is a semi-solid cosmetic preparation containing small abrasive or exfoliating particles that help remove dead skin cells, dirt, oil, blackheads, and impurities from the skin surface. The process of removing dead skin cells from the outer layer of the skin is called exfoliation.[7] Exfoliation is important because dead skin cells accumulate on the skin surface over time, leading to clogged pores, dull complexion, rough texture, and acne formation. Face scrubs help clean the pores deeply and improve blood circulation, resulting in fresh and glowing skin. Face scrubs are generally applied by gently massaging the scrub on wet skin in circular motions and then washing it with water. The exfoliating particles present in the scrub face wash mechanically remove dead skin cells and impurities.[8]

Regular use of face scrub offers several benefits such as

- Removal of dead skin cells
- Deep cleansing of pores
- Reduction of blackheads and whiteheads
- Improved blood circulation
- Smooth and soft skin
- Enhanced skin glow
- Better absorption of skincare products

Scrub face Wash are typically formulated with a combination of herbal extracts, plant oils, and essential oils, which provide a host of therapeutic properties such as antimicrobial effects, Anti-inflammatory effects, Antioxidant properties. Herbs are the natural products mostly found in the treatment of almost all diseases and skin problems owing to their high medicinal value, cost effective ness, availability and compatibility.[9]

- **Ubtan powder:** Ubtan Powder is Made with pure ingredients like turmeric, sandalwood, Multani Miti & rose petals. It helps lighten pigmentation and enhance natural glow. Ubtan has been traditionally used for skin brightening, de-tanning, exfoliating, and improving overall skin texture. It helps remove dirt, excess oil, and dead skin cells while gently clarifying the skin to reveal a smoother, more even-toned complexion. Ubtan powder is suitable for all skin types and can be used on the face and body.[10]
- **Walnut shell powder**: It is a natural exfoliator derived from walnut shells. It contains alpha-hydroxy acids (AHAs) that help remove dead skin cells and promote cell turnover. Walnut shell powder can improve circulation, reduce inflammation, and leave skin soft

and smooth. It is also compatible with most materials used in cosmetics and pharmaceutical preparations. Walnut shell powder is also known as purified walnut shell and is normally in a powdered form. Walnut shell powder has anti-inflammatory properties that can help reduce redness and irritation.[11]

- **Neem Extract:** It is a potent natural concentrate derived from the leaves, bark, and seeds of the Azadirachta indica tree. It is highly antibacterial, anti inflammatory and antioxidant properties. It helps to treat acne, soothe inflammation and fade scars and Natural remedies to combat dandruff. Neem extract is added in various cosmetics, soaps and face washes and scrub also.[12]
- **Coco Glucoside:** It is an ultra-mild, plant derived surfactant and foaming agent made from coconut oil and fruit sgars. it is highly biodegradable and non-toxic. It helps in cleaning, foaming and viscocity building. Coco-glucoside is used as a surfactant that helps to lift dirt and oils from the skin, allowing them to be washed away. It is also used in Baby care, Hair care, Skin care and Household.[13]
- **CAPB:** Cocamidopropyl betaine (CAPB) is a mixture of closely related organic compounds derived from coconut oil and dimethylaminopropylamine. CAPB is available as a viscous pale yellow solution and it is used as a surfactant in personal care products and animal husbandry. The name reflects that the major part of the molecule, the lauric acid group, is derived from coconut oil. It is used as a foam booster in shampoos. It is a medium-strength surfactant also used in bath products like hand soaps. It is also used in cosmetics as an emulsifying agent and thickener, and to reduce the irritation that purely ionic surfactants would cause.
- **Glycerin:** Glycerine is a clear, colourless, and odourless liquid that naturally occurs in plants and animals. It has a syrup-like texture. Glycerine is widely used in skincare as a humectant, meaning it draws water toward the skin and helps retain moisture, keeping the skin soft and hydrated. This is why it is commonly found in lotions, creams, cleansers, and serums, and is suitable for most skin types, including dry, sensitive, and ageing skin.[12]
- **Vitamin E Oil:** Vitamin E is an important vitamin for the proper function of many organs in the body.It is also an antioxidant. Vitamin E that occurs naturally in foods (RRR-alpha –tocopherol) is different from man made vitamin E that is supplements (all-rac-alpha-tocopherol).[13]
- **Xanthan gum**: Xanthum Gumis a polysaccharide with many industrial uses, including as a common food additive. It is an effective thickening agent and stabilizer that prevents

ingredients from separating. It can be produced from simple sugars by fermentation and derives its name from the species of bacteria used, *Xanthomonas campestris*.

- **Ubtan Fragrance oil**: Ubtan Fragrance oil is used for its calming and relaxing properties. It has mild antimicrobial effects and is known to reduce skin irritation and redness.
- **Citric acid:** Citric acid occurs in a variety of fruits and vegetables, most notably citrus fruits. Lemons and limes have particularly high concentrations of the acid; it can constitute as much as 8% of the dry weight of these fruits (about 47 g/L in the juices[12]). The concentrations of citric acid in citrus fruits range from 0.005 mol/L for oranges and grapefruits to 0.30 mol/L in lemons and limes; these values vary within species depending upon the cultivar and the circumstances under which the fruit was grown.
- **Iscaguard PEG:** Iscaguard® PEG is a preservative blend, suitable for preservice both rinse-off and leave-on products. It consists of Phenoxyethanol, a versatile, widely used preservative for personal care formulations and triethylene glycol which increases the effectiveness by lowering the surface tension in order to enhance the activity at the cell membranes of microorganisms. Iscaguard® PEG has a broad, balanced spectrum of activity against bacteria, yeasts, mould and fungi.

2. MATERIALS AND METHODS

2.1 MATERIALS

Collection of active ingredients like Ubtan powder, Walnut shell powder, Neem Extract, Coco glucoside, CAPB, Glycerin, Vitamin E oil, Xanthum Gum, Iscaguard PEG, ubtan FO, D.M Water were collected from different manufacturing company and local market.

Table 1: Common herbal ingredients in Ubtan Scrub Face Wash formulation.

Sr.no	Name of ingredients	Quantity to be taken	Category
1	Ubtan Powder	960gm	Antiseptic & Antifungal
2	Walnut shell powder	960gm	Anti-inflammatory
3	Neem Extract	100ml	Antioxidants
4	Coco Glucoside	3000ml	Surfactant
5	CAPB	3000ml	Emulsifying agent
6	Glycerin	800ml	Humectant
7	Vitamin E oil	80ml	Antioxidants
8	Xanthum Gum	240gm	Thickening agent
9	Ubtan F.O	100 to 200ml	Fragrance
10	Citric Acid	200gm	pH Adjuster
11	Iscaguard PEG	60ml	Preservative
12	D.M.Water	11,500ml(11.5 lit)	Vehicle

2.2 METHODS

Step 1 — Main Water Charging

1. Clean and sanitize all equipment and apparatus.
2. Transfer 11.5 liters DM Water into clean stainless steel vessel.
3. Start slow mixing at: 200-300 RPM.
4. Ensure the Water temperature must be 25°C–35°C.

Step 2 — Prepare Xantham Gum Slurry

1. In a Seprate vessel, Add 800 ml of glycerin to that add about 240 gm of Xanthum Gum.
2. Mix continuously until smooth lump free slurry forms.

Step 3 — Hydration of Thickner

1. Slowly add xanthum gum slurry into main vessel.
2. Continue slow stirring for about 20-30 minutes.
3. After complete hydration until solution becomes smooth and slightly viscous.

Step 4 — Addition of Surfactant

1. Add 3000ml Coco glucoside slowly with gentle stirring.
2. Mix for 10 minutes.
3. Add 3000ml CAPB slowly.
4. Continue mixing for another 10-15 minutes.
5. Avoid excessive aeration and foam generation.

Step 5 — Addition of Herbal and Active ingredients

1. Add 100 ml of Neem Extract.
2. Add 80 ml Vitamin E Oil.
3. Mix uniformly for 10-15 minutes.

Step 6 — Addition of Exfoliant

1. Slowly add 960gm Ubtan Powder in portions.
2. Mix continuously to avoid lump formation.
3. Add 960 gm of Wallnut Shell Powder gradually.
4. Mix it continuous until uniform mixing suspension is achieved.

Step 7 — Addition of Preservative and Fragrance

1. Add 60 ml Iscaguard PEG.

2. Mix for 5 minutes.
3. Add about 100-200 ml of Ubtan Fragrance Oil.
4. Mix gently for 5-10 minutes.

Step 8 — pH Adjustment

1. Dissolve 20 gm of citric acid in small quantity of DM water Seprately.
2. Add slowly into main batch
3. Check their pH. **(Note:** pH is between 5.0 to 5.5 **)**
4. Adjust carefully.

Step 9 — Final Mixing

1. Mix final batch for a5 minutes at slow speed.
2. Ensure uniform texture and exfoliant suspension.
3. Remove trapped air by keeping batch at rest for 2-4 hours.

3. EVALUATION PARAMETERS

Appearance: The Scrub face wash should have a creamy gel with suspended particles.[14]

Colour: The Face wash is brown in colour.

Odour: The smell of formulation was checked by applying preparation on hand and feels the fragrance of Ubtan.

pH: The pH of the Face wash is one of the most important properties for ensuring its compatibility with the skin. The pH of the prepared Face wash was measured using a digital pH meter (SOP, GHRU-ELICOLI- 120). The pH of formulation should be in the range of 5 to 5.5, The pH meter was calibrated using standard buffer solutions of pH 7, 9.2; approximately 1 ml of face wash was weighed and dissolved in 50 ml of distilled water, and its pH was measured. Scrub Face wash should ideally have a pH of, which closely matches the natural pH of human skin.[14]

Stability: No Phase Separation occurs in Scrub face wash.

Homogeneity: All Face wash formulations were placed on a platform and tested for homogeneity by visual inspection. They were tested for their appearance and the presence of any lump flocculates or aggregates.

Consistency: The prepared Formulation produces a Semisolid Consistency that was examined by visual examination.

Washability: Prepared formulations were easily washed with water. That was examined by visual examination.

Extrudability: The prepared formulations show that good extrudability of formulation. That was examined by visual examination.

Foam Height: A small amount of face wash applied on the skin and rub the hand. The formulation was found to produce consistent foam. That was examined by visual examination.

Skin Irritability: A small amount of facewash was applied on the skin and kept for a few minutes, and found to show redness, oedema, inflammation, and irritation during studies. Formulation is safe to use. That was examined by visual examination.

Test for microbial growth: The developed Face wash was inoculated into plates of agar media using the streak-the-plate method, and a control was prepared. The plates were placed in an incubator and incubated at 37°C for 24 h. After the incubation period, the plates were removed, and microbial growth was checked by comparing them with the control.[15]

In vitro antibacterial activity: In vitro, antibacterial activity was assessed in isolated colonies of Streptococcus aureus. The agar well diffusion technique was used to determine the zone of inhibition and minimum inhibitory concentrations (MIC). The strains of S. Aureus were inoculated into a prefabricated agar plate. Plates were dried, and four wells were made with the help of a 6-mm agar well cutter. 1 ml, 2 ml, and 3 ml of prepared mouthwash were loaded into the wells. The agar plates were kept undisturbed to allow the passive diffusion of herbal mouthwash into the agar culture medium. The plates were then incubated at 37°C for 24 h. The commercial antibiotic ampicillin (50mg/ml) was used as a positive control for S. aureus. The zone of inhibition (mm) was recorded for each plate and compared with the control.[17]

4. RESULT AND DISCUSSION

EVALUTION PARAMETERS

Table 2: Evaluation Parameters Required For Ubtan Scrub Face Wash.

SR.NO	PARAMETERS	VALUES
1	Appearance	Creamy gel with suspended scrub particles
2	Colour	Herbal beige/Brown
3	Odour	Pleasant Ubtan Fragrance
4	Shape	Rectangle shape
5	pH	5 to 5.5
6	Stability	No phase separation
7	Homogenity	No Aggregates
8	Consistency	Semisolid
9	Washability	Good
10	Extrudability	Good
11	Foam Height	Moderate
12	Skin Irritation	No Irritation

The Scrub face wash was created with all skin types in mind, since the procedure was maintained and monitored. The most important thing that ubtan scrub soap possess is that free from chemicals and are more eminent than synthetic ones. It is intended to remove debris, oil, and makeup gently while also treating and preventing breakouts. It cleans the pores and removes impurities Thus, in this research paper, the prepared ubtan scrub Face wash possesses anti-oxidant, Antiseptic, Antifungal, Anti-bacterial and anti-inflammatory properties that can be used as beauty regime. Appearance met expectations too, while the acidity level stayed within safe range for touching human skin.

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