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Research Article

Formulation And Evaluation of Face Wash

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ABSTRACT

This study aimed to formulate and evaluate a herbal face wash using a blend of chemical and natural ingredients to ensure effective cleansing with minimal skin irritation. The formulation included salicylic acid, sodium phosphate, light liquid paraffin, methyl paraben, sodium lauryl sulphate, sorbitol, activated charcoal, and distilled water, along with natural components such as turmeric oil, raw honey, peppermint oil, and rose water. The face wash was prepared in the laboratory of the School of Pharmacy, G H Raisonni University, using standard apparatus and instruments. Among the different formulations developed, Formulation 3 showed the most promising results based on evaluations of pH, skin irritability, and microbial activity. It maintained a skin-friendly pH, caused no irritation upon application, and exhibited good antimicrobial properties, making it suitable for regular use. The study concludes that a facial cleanser that is both safe and effective can be made by combining herbal and synthetic chemicals in a balanced way.

INTRODUCTION

Face wash is a cleansing product designed to prevent and treat acne, a skin condition characterized by the formation of pimples, blackheads, and whiteheads. Face wash is one of the most popular and effective ways to manage acne, as it helps to remove excess oil, dirt, and dead skin cells that can clog pores and contribute to breakouts. Acne vulgaris is a pervasive disorder of skin that affects virtually all individuals at least

once during their lives. The incidence of acne peaks at teenage, but substantial numbers of men & women between 20-30 years of age are also affected by the disorder. Salicylic acid, known for facilitating the sloughing of dead skin cells and other cellular debris, is often used in treating acne, as well as other skin conditions that include psoriasis, keratoses, and ichthyoses. Several different treatments are used to treat acne, a common skin condition. A further challenge with these products is the requirement of irritating

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sulphates to solubilize salicylic acid in amounts of 1% or more, by weight. A great increase in the worldwide demand for herbal cures, herbal skin care products, and even herbal cosmetics was observed in recent years. Skin, being the most exposed part of our body to pathogens, requires protection from skin diseases, especially acne-causing bacteria. When antibiotics are used for a prolonged period, the organisms become resistant to the medications. This multi-factorial adaptation is reliant on the host parameters, including hormones, stress levels, and the organism's susceptibility to the therapy. The herbal treatment solutions have been researched as a solution to this issue. The herbal extracts were modified and created into a poly-herbal anti-acne face wash because they couldn't be used directly for therapy.

Anatomy of Skin

The largest organ in the body in terms of weight and surface area is the skin. It has about 16,000 square centimetres of surface. 8% of an adult's body weight is made up of skin. It is the tissue or outermost layer of the living body.

The Epidermis

The outermost layer of skin is called the epidermis, and it has a thickness of about 0.2 mm. There are no capillaries or veins in this layer. The position of the body affects the thickness of the epidermis. Keratinocytes and dendritic cells make up the majority of the cells in the epidermis. The epidermal layer is frequently referred to as the metabolically active tissue.

The outermost layer is classified into five sublayers, and these are:

- **Stratum Corneum:** Outer Protective Layer
- **Stratum Lucidum:** Clear Layer, in Thick Skin Like Soles and Palms
- **Stratum Granulosum:** Granular Layer

- **Stratum Spinosum:** Prickly Layer

The Dermis

Most of the dermis is made up of collagen and elastin, as well as fibroblasts. This layer has several functions.

- 1) Blood and lymphatic vessels in the dermis provide nourishment to the skin and remove poisons or waste.
- 2) Sweat glands are present in the dermis. They create sweat through your pores, removing impurities and cooling your body.
- 3) The dermis also contains the hair follicles, which are where your hair attaches, and the sebaceous glands, which occasionally overproduce the oils that make your skin smooth and velvety, leading to rashes and oily skin.

The Subcutaneous layer

The fat layer beneath the dermis is also known as the **Hypodermis**. It goes deep that the active ingredients in your skincare products can never reach.

Herbal Cosmetics

Cosmetics Made from Herbs. The Greek term "kosmetikos," which means to embellish, is where the word "cosmetics" originates. Since then, a cosmetic is any substance intended to enhance or improve one's appearance. The Vedas, an ancient sacred text of the Indian people, refer to an ancient kind of herbal medicine because the history of herbs in ancient India is very old. The use of herbs and natural remedies to treat health concerns is central to the traditional herbal healing practices of Ayurveda and Unani. Even while it can seem that herbal remedies are something new to Western healers and doctors, the majority of prescribed medications still contain plant extracts. Cosmetics are generally external preparations and are meant to be applied to external parts of the body.



Face Wash

A face wash is a facial care product that is used to remove makeup, dead skin cells, oil, dirt, and other types of pollutants from the skin of the face. This helps in clearing clogged pores and avoiding skin disorders like acne. Along with a toner and moisturiser, a face wash can be used as part of a skin care routine. The substance used to cleanse the skin without drying it out is called a face wash. Another frequent name for face wash is "cleanser." All skin types were shown to benefit similarly from face wash products. It works wonders for hydrating dry skin and getting rid of oil and grime. Cleaners and face washes are both used to remove pollutants, oil, and other debris from your face. A face wash is a gentle cleanser that hydrates the horny layer without being harsh on the skin and performs the essential function of keeping skin clean, germ-free, smooth, and fresh. so that skin seems youthful and vibrant. Cleansing, anti-wrinkle, anti-acne, moisturizing, and skin fairness are some of the possible uses

Advantages of face wash

- It helps to remove dead skin cells, which helps new skin cells replace old ones.
- It helps to keep skin fresh and healthy.
- The mixture of dead skin cells and excessive oil clogs pores, which can lead to acne whiteheads, blackheads, and a total weary appearance, and exfoliating the pores regularly avoids all the above skin problems.

Disadvantages of Facewash

- Itching, Skin rashes, a Sensation of feeling warm

Uses of facewash

- For cleansing the skin.

- Anti-aging.
- Help plug the pores clear.

Properties of facewash

- Facial pores and Oily skin are caused by oversecretion of sebum by sebaceous glands which clogs the pores, making the skin oilier.
- Oily skin requires cleansers with herbs and botanicals, which will clean the pores and reduce oil build-up.

Liquid-Based Facewash

Liquid-based face washes have been widely used in pharmaceuticals due to their high dosing flexibility, ease of swallowing, and quick onset of action. Typically, they are categorized as monophasic and biphasic formulations, wherein within these two broad categories lie a wide range of dosage forms. Liquid-based face wash is a type of facial cleanser that comes in a liquid form. It is designed to cleanse the skin of dirt, oil, and impurities, leaving it feeling fresh and clean.

MATERIALS AND METHODS

The liquid-based herbal facewash was prepared using the following chemicals, apparatus, and instruments. Most of the chemicals are taken from the School of Pharmacy, G H Raison University, Saikheda Laboratory. The chemicals used are salicylic Acid, sodium phosphate, liquid paraffin(light), methyl paraben, sodium lauryl sulphate, sorbitol, activated charcoal, distilled water, and Turmeric oil, raw honey, peppermint oil, and rose water, which were purchased from a local shop in Nagpur. Apparatus such as a beaker, mortar and pestle, glass rod, funnel, and measuring cylinder are available in the college's laboratories. Instruments such as a weighing balance, magnetic stirrer, PH meter, and Brookfield viscometer are available in the laboratories of the college

Formulation Table



Table no 01: Composition of face wash

| Sr no | Ingredients | F1 | F2 | F3 | Uses |
|---------------|-------------------------|--------|--------|-------|---|
| PART A | | | | | |
| 1. | Salicylic acid | 3gm | 2gm | 1gm | Exfoliating agent |
| 2. | Sodium phosphate | 3gm | 3gm | 3gm | Emulsifying agent |
| 3. | Liquid paraffin (light) | 3mL | 3mL | 2.5mL | Emollient |
| PART B | | | | | |
| 4. | Raw honey | 0.5mL | 0.5mL | 1mL | Antioxidant, Sweetener |
| 5. | Turmeric Oil | 0.15mL | 0.15mL | 1mL | Antimicrobial agent, Anti - inflammatory, Antioxidant |
| 6. | Sodium lauryl sulphate | 15gm | 15gm | 15gm | Foaming agent |
| 7. | Sorbitol | 6mL | 6mL | 6mL | A hydrating and moisturizing agent |
| 8. | Methyl paraben | 0.1gm | 0.1gm | 0.1gm | Preservative |
| 9. | Activated charcoal | 1gm | 2.5gm | 3gm | Skin whitening agent |
| 10. | Peppermint Oil | 1mL | 1mL | 0.5mL | Antibacterial |
| 11. | Rose water | 5mL | 5mL | 4mL | Fragrance and Cooling Agent |
| 12. | Water | 62.25 | 61.75 | 62.9 | vehicle |
| 13. | Total volume | 100mL | 100mL | 100mL | - |

Method of Preparation

Facewash was prepared in the following ways:

Preparation of Mixture A

- Take a clean and dry mortar and pestle.
- Add salicylic acid and sodium phosphate into the mortar and pestle and triturate properly.
- To this, add a ml of liquid paraffin (light) and continue trituration.

Preparation of Mixture B

- Take another clean and dried mortar and pestle and add Raw Honey, Turmeric Oil, and triturate.

- Sodium lauryl sulphate, sorbitol, and methyl paraben were added to the above mixture and triturated well.
- **Mixtures A and B** were mixed and triturated until a proper consistency is obtained.
- To this, add a gm of Activated charcoal and mL of Peppermint Oil and rose water, and mix well.
- To this, Distilled water was added. Properly mix all the above ingredients.

Evaluation of Facewash

Colour and Odour

Physical parameters, such as odour and colour,

Measurement of pH



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 skin facial product that is 4.5-7, But the salicylic acid facial product contains range 4.5-5.25. The pH meter was calibrated using standard buffer solutions of pH 7, 9.2; approximately 1 ml of mouthwash was weighed and dissolved in 50 ml of distilled water, and its pH was measured.

Homogeneity Test

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 Test

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

Greasiness Test

The prepared formulation does not feel greasy upon application to the skin. That was examined by visual examination.

Washability Test

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

Extrudability Test

The prepared formulations show that good extrudability of formulation 3. That was examined by visual examination.

Foamability Test:

A small amount of facewash applied on the skin and rub the hand. the formulation was found to

produce consistent foam. That was examined by visual examination.

Skin Irritability Test

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 3 it's safe to use. That was examined by visual examination.

Test for microbial growth in developed Face wash.

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.

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.

Results and discussion

Table no 02: Evaluation parameter of face wash

| Sr. No | Evaluation parameter | F1 | F2 | F3 |
|--------|--------------------------------|--------------------|--------------------|--------------------|
| 1. | Organoleptic properties | | | |
| | Colour | Whiteish Black | Greyish black | Dark Black |
| | Odour | Pleasant Fragrance | Pleasant Fragrance | Pleasant Fragrance |



| | Texture | Smooth, Slippery | Smooth, Slippery | Smooth, Slippery |
|----|------------------------|------------------|------------------|------------------|
| | State | Liquid | Liquid | Liquid |
| 2. | pH Test | 5.13 | 5.94 | 6.08 |
| 3. | Consistency Test | Liquid | Liquid | Liquid |
| 4. | Greasiness Test | No | No | No |
| 5. | Washability Test | Good | Good | Good |
| 6. | Homogeneity Test | No aggregate | No aggregate | No aggregate |
| 7. | Extrudability Test | Good | Good | Good |
| 8. | Foamability Test: | Good | Good | Good |
| 9. | Skin Irritability Test | | | |
| | 1 st Hour | yes | Yes | No |
| | 6 st Hour | No | No | No |

Table 03: Results of the agar well diffusion antibacterial assay

| Organism | Zone of inhibition(mm) | | |
|------------------------------|------------------------|-----|-----|
| | 1ml | 2ml | 3ml |
| <i>Staphylococcus Aureus</i> | 10 | 12 | 13 |
| Standard ampicillin | 12 | 13 | 15 |



Fig. 1: Agar diffusion method for assessing antibacterial activity.

CONCLUSION

The face wash was created with all skin types in mind, since the procedure was maintained and monitored. It is intended to remove debris, oil, and makeup gently while also treating and preventing breakouts. Activated charcoal cleans the pores and removes impurities. Honey helps to prevent acne and clam irritation while also maintaining moisture, and peppermint oil helps to heal acne and offer bright and beautiful skin. Rose water is an excellent natural cleanser for the face since it nourishes the skin even in the summer and leaves a nice sensation on the skin after each wash. This face wash was created for all skin types and may

be used in daily life. This face wash was created in two batches (F 1, F2&F3), with **formulation 3** doing well on the pH and irritant tests, and with microbial growth.

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