

Original Research Article

Formulation and Evaluation of Herbal Face Wash for the Preventing Dermatological Problems

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KEYWORDS

Herbal Facewash, Turmeric, Aloe Vera, Orange Peel Oil, Biological Activity, Natural Cosmetics.

ABSTRACT:

The face wash is used to cleanse the face without drying it out. It is also commonly known as a "cleanser". This product is found to be equally good for all skin types. A face wash is a mild cleanser that does the vital job of keeping skin clean, germ-free, smooth, and fresh and moisturizes the horny layer without any harshness to the skin. So that skin looks young and energetic. Various types of herbal ingredients can be used to manufacture face wash. The herbal face wash formulated by hydroalcoholic extract of turmeric, orange peel oil, and aloe vera is beneficial and has no side effects. The plants in this article have better antioxidant, antimicrobial, and anti-inflammatory properties. All herbal ingredients used in this formulation are easily available in the market of the surrounding area. Skin is part of the body and face skin is the most sensitive and important for human beings to appear good-looking. The herbal plant used in formulation has cosmetic and medicinal properties. The plants used in face wash like aloe vera, turmeric, etc. have properties for softening skin, removing acne as well as promoting healing. The herbal formulation was evaluated by different types of parameters like appearance, color, pH, viscosity, odor, solubility, etc. After formulation evaluation of the formulation is essential for measuring the safety and efficacy of the formulated product otherwise it may cause various harmful effects.



Extraction of the process of Aloe vera, Turmeric, and orange peel oil by different methods for herbal face wash

1. Introduction

Natural product have their importance as they contain various kinds of active pharmaceutical ingredients such as alkaloids, flavonoids, glycosides, tannins, amino acids, fibers, resins, etc. These natural ingredients show vital biological properties such as antimicrobial, antifungal, antibacterial, and various other properties. These ingredients are used for different types of solid and liquid dosage forms. Different types of skin problems are also faced by humans. So, the body needs more immunity to heal it. Some of the medicines improve immunity along with other issues. Skin is one of the most important and sensible parts of the human body. Semisolid preparation like Gels is used to protect the

skin from harmful UV rays. Different types of skin problems like acne, pimples, and rashes occur nowadays due to abnormal lifestyles. Different semisolid dosage forms are used to improve these situations [1-3].

The Indian herbal drug industry is considered to be one of the oldest systems of medical care in the world. The use of herbs for medicinal purposes was mentioned in the Vedas, an ancient religious text. Ayurveda and Unani are two ancient healing methods that utilized herbs and natural products to address various health conditions. Plant extracts are still commonly used in most prescribed medicines today. The global community now recognizes the benefits of the traditional form of medicine, resulting in a significant rise in demand for Indian herbal drugs. The demand for herbal cures, skincare products, and cosmetics in recent years. The skin is a vital and extensive organ of the body, and it plays a significant role in defining human personality, especially the skin on the face, which is sensitive. The condition of an individual's skin can also be an indicator of their overall health. Cosmetics have been developed to address various skin concerns, such as reducing wrinkles, fighting acne, and controlling oil secretion. These products aim to improve the appearance and texture of the skin, leading to a more youthful and healthier-looking complexion. However, it is essential to choose cosmetics that are safe and effective, as some products may contain harmful chemicals that can damage the skin in the long run [4-8]. It performs many vital functions, including protection against external physical, chemical, and biological assailants, as well as prevention of excess water loss from the body and a role in thermoregulation. To keep skin healthy, clear, and glossy, a balanced nutrition is required. Apart from balanced nutrition, hormonal changes especially during puberty in both sexes cause many changes in the body. Among various changes, Acne vulgaris is the most common. Acne vulgaris is a common skin condition with a substantial cutaneous and psychological disease burden. To overcome the problem of acne vulgaris and to get rid of the use of synthetic drugs such as clindamycin, a synergistic antiacne face wash gel has been formulated. Herbal healing has been mentioned from the ancient era, from Vedas, and even from ancient religious work. Probably it is the oldest medical care system in the world [9-12]. Herbal medicines deal with the use of herbal extracts or natural products for the betterment of health conditions. However, herbal products are more acceptable with the belief that they are safe possess many therapeutic properties, and have no or fewer side effects as compared to modern chemical entities. Hence requires protection and prevention from skin diseases by utilization of formulations having antibacterial, antioxidant, anti-inflammatory, and other properties. During puberty, an imbalance of internal constituents and hormonal balance may cause many skin problems [13-18]. Long-term uses of antibiotics for the treatment develop resistance to the drugs. To overcome this problem, herbal alternative solutions for the treatment have been studied.

Types of skin problems [19-22]

Acne

Acne vulgaris is a skin condition where oil and dead skin cells clog hair follicles. This is one of the most common skin problems in adults. Acne is mainly observed in the face. The main cause of this problem is uncontrol sebum production from the sebaceous gland. Another reason is the clogging of hair follicles by oil and dead skin cells also some bacterial infections and inflammation cause acne.

Wrinkles

Sun-exposed skin such as the face, neck, and hands are the most affected by wrinkles. Without sun exposure pollutants and smoking also cause wrinkles. A broad-spectrum sunscreen helps by blocking UV rays.

Skin Rashes

Rashes are often itchy, painful, and irritated skin on the body. Some variety of causes of skin rashes are bites, chicken pox, drug allergies, etc. There are some important types of skin rashes like fleabites, fifth disease, rosacea, impetigo, etc.

Dark Circles

Possible causes of dark circles under the eye are little sleep, aging, and allergies; Fatigue is a well-known cause.

Black Spot

Hyperpigmentation is a skin condition that occurs by producing more melanin than usual. There is no need for any treatment but people choose treatment for cosmetic reasons.

Oily Skin

Producing too much oily substance known as sebum by sebaceous glands in your skin makes the skin oily. Fluctuating hormones are the health problems of oily skin, environmental factors are humidity.

Face Wash

A face wash is a type of facial cleanser that is specifically designed to remove makeup, dirt, oil, dead skin cells, and other impurities from the skin of the face. This helps to unclog pores and prevent skin conditions such as acne, leaving the skin feeling clean and refreshed. A face wash is typically used as part of a daily skincare routine, along with a toner and moisturizer [23-28].

Advantages of Face Wash

There are several benefits of using a face wash as part of your skincare routine, including [29-35].

Removal of Dead Skin Cells

Regular use of a face wash helps to remove dead skin cells from the surface of the skin, which allows new skin cells to replace them. This promotes healthy skin cell turnover and helps to keep the skin looking radiant.

Fresh and Healthy Skin

A face wash helps to remove dirt, oil, and other impurities from the skin, which can leave it looking dull and tired. Regular use of a face wash can help to keep the skin looking fresh and healthy.

Prevention of Acne

Excess oil and dirt can clog pores and lead to acne breakouts. Using a face wash can help to unclog pores and prevent the formation of acne whiteheads, blackheads, and other skin problems.

Slower Development of Wrinkles

By removing dead skin cells and promoting healthy skin cell turnover, a face wash can help to slow down the development of wrinkles.

Improved Blood Circulation

The exfoliating action of a face wash can help to improve blood circulation in the skin, which can promote skin regeneration and rejuvenation.

Properties of Face Wash

When choosing a face wash, it is important to look for one with the following properties:

1. A good face wash should be stable and have a pleasant appearance.
2. The face wash should soften on application to the skin, making it easy to spread.
3. The face wash should spread easily on the skin without dragging or feeling oily or greasy.
4. After the water has evaporated, the residue of the face wash should not become viscous.
5. The physical action of the face wash should be that of flushing the skin and opening pores, rather than absorbing into the skin.
6. A thin emollient film should remain on the skin after use, providing a protective barrier and keeping the skin hydrated.

Additives Used in Face Wash

Humectants

Humectants are hygroscopic substances used to keep things moist; making them ideal ingredients for face wash products. It is the opposite of a desiccant. It is often a molecule with several hydrophilic groups, most often hydroxyl groups, and locks it into the skin. By helping to maintain the skin's natural moisture balance, humectants can help prevent dryness, flakiness, and other common skin issues.

Preservatives

Preservatives are substances used to prevent microbial growth in various products, such as food, and pharmaceuticals. Some of these organisms can secrete poisonous substances (toxins), which are dangerous to human health and can even be fatal. Examples; methyl paraben, and propyl paraben.

Gelling Agents

Gelling Agents are ingredients that will turn your water, or oil, phase into a gel, which is thickened but, without stiffness. Emulsions thickened with Gelling Agents will be more mobile, and fluid, rather

than stiff. Some of these gels have thixotropic properties when they become thinner or more liquid when force or pressure is applied.

Foaming Agents

A foaming agent is a substance that is added to a liquid to create a foam or froth. Foaming agents work by decreasing the surface tension of the liquid, allowing air to be trapped in the mixture and creating bubbles. These bubbles then expand and create a foam or froth on the surface of the liquid.

2. Materials and Method

Collection of Herbs and Chemicals

All the herbs were collected from the local market of Lucknow and dried in sunlight. At first, the plant parts are collected and cleaned with fresh water to remove dust. Then the raw plants were placed in hot water (40-50°C) to free from any bacteria that may be present on the surface. After drying properly and extracted by the maceration method by using distilled water as a solvent. Then the acquired extracts were filtered using filter paper.

Chemicals

Ultrez 20 Carbomer: Gelling Agent, Glycerin-Humectant, Sodium Lauryl Ether Sulphate- Surfactant, Sodium Methyl Paraben, Sodium Propyl Paraben: Preservatives and Sodium Hydroxide: Sodium CMC, Glycerol, Sodium benzoate, Sodium lauryl sulfate were collected from chemical market.

Authentication and Evaluation of Herbs

All the herbs were evaluated as per Ayurvedic Pharmacopeia of India.

Herbs Used in Facewash

A. Aloe vera

Synonym :(Aloe, Aloe Africana, Aloe arborescens, Aloe barbadensis). Biological source: Aloe is obtained from the dried juice of the leaves of Aloe barbadensis. Family: Asphodelaceae.

Chemical constituent: Aloe-emodin Chemical nature: The principal active composition of aloe is aloin and aloe-emodin, Barbalin, isobarbolin, and saponins.

Uses: Antibacterial and anti-inflammatory properties, cooling effect on rashes and sunburns. It is used as a Moisturizing agent and in cosmetic aloe vera gel to improve skin integrity. The anti-inflammatory properties of aloe vera help to reduce redness in acne, burns, and even wounds. It also enhanced skin cell production and healing properties, speeding up the wound and acne scar healing. In addition to that, it reduces blistering and itchiness. Aloe vera has many skin benefits, from skin glow to keeping soft skin and hair care items. Aloe has antioxidant properties that prevent skin cell damage [36, 37].

B. Turmeric

Biological Source: Root and rhizomes of Curcuma longa Linn

Synonym: Haldi, Indian Saffron; Family-Zingiberaceae

Chemical constituent: Curcumin Zingiberene Borneol Caprylic acid curcuminoid, Curcuminoids; curcumin (diferuloylmethane, the primary constituent responsible for the yellow color of turmeric), demethoxy curcumin, and bisdemethoxycurcumin.

Uses: Antiseptic, Anti-inflammatory, Spice, Carminative, Antimicrobial, Antioxidant, Burns and wound treatment, itching, reduce scarring, lightning antiwrinkle in skin cosmetics. The anti-inflammatory qualities can target your pores and calm the skin. Turmeric is also known to reduce scarring. It has long been used in many parts of the world as a spice, food preservative, and color. It serves as a common home cure in traditional medicine for several illnesses. In addition, volatile oils (turmerone, atlantone, and zingiberene) also have pharmacological activity. In addition, sugars, proteins, and resins are also present in turmeric. Turmeric is an amazing ingredient for skin care. It can resolve several skin problems, including acne, skin darkening, skin pigmentation, rashes, etc. It has been used since ages to boost the health and glow of the skin. Turmeric works wonderfully for skin brightening and lightening. Plus, it contains an anti-oxidant compound known as curcumin, and curcumin comes with multiple skin benefits. It fights off acne, and acne scars, and also reduces skin pigmentation. It possesses multiple pharmacological activities, including antioxidant, antimicrobial, anti-inflammatory, anti-carcinogenic, anticoagulant, antidiabetic, and immunological [38, 39].

C. Orange Peel Oil

Synonym: Orange cortex; Biological source: Citrus Aurantium Linn; Family: Rutaceae.

Chemical constituent: Vitamin C, Pectin, Volatile oil, Hesperidin, Iso-hesperidin, Neohesperidin, Aldehydes, Citral, Citric acid, Ascorbic acid, minerals, flavonoids and essential oils.

Uses: Orange peel oil is used as a carminative, aromatic, flavoring agent, and stimulant. The plant has antimicrobial, anti-inflammatory, and anti-hyperpigmentation activity. As a rich source of vitamin C and citric acid, citrus plants are known for their detoxifying effects. Because of the health benefits of eating lemons, there is a growing popularity for using lemons as a natural treatment for skin conditions, like age spots and acne. Citrus fruit is a natural method of increasing collagen in facial skin. Collagen is a protein that naturally breaks down with age, which can then result in fine lines and wrinkles. As an antioxidant, vitamin C may help prevent free radicals that can damage collagen, leaving you with smoother skin. Because of its acidic nature and anti-microbial properties, fighting skin breakouts like acne, pimples, and blackheads by cleaning dirt and oil from deep within. It further helps in tightening the skin pores to give you smooth skin [40].

Pudina

(Mentha) Family: Menthaceae; Plant part: leaf

Chemical constituent: Menthol, Eucalyptol

Pudina consists of the aerial part of Mentha viridis Linn (Family: Lamiaceae) a perennial, creeping aromatic herb of 30 to 90cm high, widely cultivated throughout the plains of India for culinary and medicinal purposes.

Uses: Gives a soothing effect, hydrates the skin, treats acne, and prevents wrinkles and fine lines. This mint face wash helps reduce the oiliness, refreshes, tones and cools the skin. Just take lemon juice, and rose water, and soak the mint leaves into it. It has a stimulating effect on the skin and improves blood circulation to the skin surface. Mint also has antibacterial, anti-inflammatory, protective, and soothing properties. It also contains salicylic acid which is also beneficial for preventing and treating pimples. That is why it also helps to control and prevent other skin eruptions, like acne, boils, and heat rash. Mint treats acne, strong antibacterial properties and vitamin A present in mint eliminates acne. It cleanses pores and tightens them, preventing blackheads, antioxidant in mint keeps the skin damage-free by neutralizing free radicals, thus diminishing dark circles. Mint boosts the circulation of blood and hydrates your skin, thus delaying the formation of wrinkles [41, 42].

Rose Water

(Rosa damascena mill L)

Chemical constituents: Geraniol, and Citronellol

Uses: Removes excess oil and impurities, and reduces blackheads, acne scars, and black spots [41, 42].

Hydroalcoholic extract of turmeric (Curcuma longa), orange peel oil, and aloe vera although there are some specific local herbal formulas available on the market. The plants have been reported in the literature as having good anti-microbial, anti-oxidant, and anti-inflammatory activity. The prepared formulation was evaluated for various parameters like color, appearance, consistency, pH, viscosity, and solubility.

Method of Formulation

S. No.	Name of ingredients	Quantity
1	Aloe vera extract	1.0 gm
2	Turmeric extract	1.0gm
3	Orange peel oil	1.0gm
4	Mentha extract	0.5gm
5	Methyl paraben	0.5 gm
6	Glycerine	2Ml
7	Carbacol	0.5 gm
8	Sodium lauryl sulphate	1.0 gm

9	Sodium carboxymethyl cellulose	0.5gm
10	Sodium benzoate	0.5gm
11	Distilled water	Qs
12	Rose oil	Qs

Experimental Work

Procedure

The weight quantity of the crude drug was boiled with distilled water in a round bottom flask attached to the Clevenger apparatus. The water vapor along with the active constituent was condensed by the condenser and collected in a graduated collecting tube of the apparatus separation of the active constituent. The volatile content takes place by discarding the solvent i.e. distilled water the pure volatile oil was collected in an airtight container [43-45].

Extraction of Curcumin from Turmeric

Procedure

First weigh accurately 70gm of turmeric powder. Then make a powder pouch for a thimble. Then extraction with 250ml of ethanol for 2hrs. Distilled it with acetone. Concentration and the extraction of curcumin are formed. Collect the crystal of curcumin.

Formulation of Face Wash

S. No.	Name of ingredients	Quantity
1.	Extract of turmeric	0.3gm
2.	Extract of aloe vera	1ml
3.	Carbopol 940	1gm
4.	Methyl paraben	0.06gm
5.	Propylene paraben	0.03gm
6.	Propylene glycol	2ml
7.	Sodium lauryl sulfate	2gm
8.	Distilled water	q.s. to 30ml

Formulation of Herbal Face Wash

Carbopol 940 was dispersed in distilled water and the beaker was kept aside to swell the Carbopol 940 to form gel. Take distilled water and the required quantity of methyl paraben and propyl paraben taken and dissolved by heating in a water bath, solution was cooled and propylene glycol and sodium lauryl sulfate was added. Further required quantity of extract was mixed into the above mixture and the solution into the carpool 940 gel with continuous stirring and triethanolamine was added dropwise to the formulation for adjustment of required skin pH and to obtain the gel at the required consistency.

Evaluation

Evaluation means the study of a drug using organs of the senses it refers to the methods of analysis like color, odor, taste, pH, and special features, such as touch and texture. Evaluation is a systemic and international process of gathering and analyzing data (qualitative and quantitative). Evaluation involves the collection of information or data facilities' judgment about the success and value of an intervention.

Evaluation parameter

Color and odor: Physical parameters like color and odor were examined by visual examination.

Color – Yellow

Odor- characteristic

Consistency

The texture of gel cleansers is entirely different from the soft and airy texture of conventional foam-based facewash. They have a dense consistency of a gel.

pH

Take 1% aqueous solution of the formulation measured by using a calibrated digital pH meter at a constant temperature.

Washability

Formulation was applied on the skin and then ease and extent of washing with water were checked manual

Foamability

A small amount of gel was taken in a beaker containing water. The initial volume was noted, the beaker was shaken for 10 the final volume was noted.

No irritancy Test

Herbal face wash was applied to the skin of human beings and observed for the effect.

3. Result and Discussion

The present study was done to prepare and evaluate the herbal face wash. For this the herbal extracts were prepared by using a simple maceration process to obtain a good yield of extract and there was no harm to the chemical constituents and their activity. The physicochemical properties were studied which shows satisfactory results for washability, solubility, foamability, and others. Also, the formulation was placed for a stability study at different temperature conditions like 20°C, 25°C, and 37°C within four weeks. There were no changes observed in washability ability, foamability as well as irritant effect. The color of the formulation was yellow. It shows a characteristic odor. The consistency of the formulation is semiliquid and it is easily pourable from the container. The pH of the formulation was neutral, the formulation showed easy washability also it was free from grittiness. Foamability was checked and it showed good foamability.

Physicochemical Evaluation of Formulated Ointment

Physicochemical parameter	Observation
1. Color	Yellow
2. Odor	characteristic
3. Consistency	smooth
4. pH	5.8
5. Solubility	Soluble in boiling water miscible in alcohol
6. Washability	Good
7. No irritancy	Non-irritant
8. Foamability	Foam appears

Uses: Combats dry skin, Psoriasis, Eczema, Acne, Anti-bacterial

Herbal face wash gel containing turmeric extract and aloe vera gel was formulated successfully by using Carbopol 940 as a gelling agent. The formulation showed better results for the formation of the gel. Evaluation tests were carried out for color, consistency, pH, washability, and foamability it showed compatible results from the studies it was concluded that the prepared formulation can be effectively used for facial care. From ancient times aloe vera and turmeric have been used for their various medicinal properties like antimicrobial, antifungal, anti-inflammatory, etc. Thus, this facewash could be used as a medium to effectively and easily use these medicinal properties as a simple dosage form [46-48].

Preparation of Herbal Extract

Ethanollic Extract of aerial parts of rhizomes of *Curcuma longa* (Haldi), leaves of *Aloe berbadensis* (Aloe Vera), and orange peel oil was prepared.

Procedure

Ethanollic extract of Turmeric, extract of aloe vera, and orange peel oil was prepared by hot extraction method using a water condenser. Require quantity of methylparaben dissolved in distilled water by heating on a water bath. Then the solution should be cooled and the required amount of sodium lauryl sulfate should be added. Further sufficient extracts quantity of Turmeric, Aloe vera, and orange peel oils should be mixed and glycerine with continuous stirring. Propylene glycol and sodium lauryl sulfate, two preservatives, were added and mixed with a small amount of water. Carbopol was gradually added to the aforementioned solution and well-mixed to create a gel-like dispersion. The

extract was gradually added to this to get a gel-like consistency. Then add rose oil dropwise for fragrance and make the gel with the required quantity of water.

Evaluation

Physical characteristics, aesthetic criteria, and pressure tests are the three categories under which facial cosmetics are evaluated. Color, adhesiveness, pH, net content, odor, size and shape of the particle, and moisture content are among the physical properties. Shape control, color dispersion, bloom testing, adhesiveness, spreadability, covering power, and handling test are the parameters examined in aesthetics. Herbal cosmetics evaluation is crucial, but there is no strict standard of conduct that can be established for all goods or even all product categories.

Spreadability

Spreadability indicates the limit of the area in which the gel spreads easily on the skin or the affected part. The biological availability of the functionality to create a gel also depends on the value of the extension. By slide scalability of two seconds, put the second slide to slide out of jail, it shows below a certain weight. Reduce the time needed to separate the two slides, a good spreadability. Two standard sizes of standard glass were taken. Herbal gel was designed in one of the slides. The other was placed on top of the slide gel, like a gel sandwich between the two slides on the 6-centimeter slide on the slide. The weight of 100 gms was placed in the upper slide so that the gel between the two slides was pressed evenly with a thin layer. The weight was eliminated and eliminated much more than the prisons that adhere to the slides. In the position, two slides are placed without interruption, thus remaining in such a way that, in this way, the weight of the body built into the upper slide is like a free dream. A weight of 20 gm was built in the upper slide. The time needed for the previous slide is to go to a distance of 6 cm, separated from the next slide by the weight of the weight. This experiment was performed three times in the average time taken to gel and commercialize gels and calculated three times. Spreadability was calculated by using the following formula: $S = M \times L / T$

Where, S-Spreadability; M-Weight tied to the upper slide (20 gm); L-Length of the glass (6.5 cm); T-Time in sec.

4. Conclusion

Face skin is delicate, and using regular soaps causes it to become dry and lose texture. Facewash is a gentle cleanser that works without irritating the skin. Facewash claims to be cleansing, anti-aging, anti-acne, moisturizing, and to improve the fairness of skin, making it look healthy and youthful. The current face washes on the market are in gel and cream form, which must be packaged in bulky plastic containers or tubes that are difficult for customers to carry while traveling. Additionally, because these face washes are aqueous, they require a preservative to maintain their stability. The goals of the current work are to prepare a herbal facewash tablet and overcome the drawbacks of synthetic face washes. Face wash tablets are designed to reduce cost, packaging size, and the use of harmful preservatives. They are also conveniently portable. The pH, irritability, hardness, friability, thickness, foaming capacity, and accelerated stability of a facewash tablet made with various ingredient concentrations were all evaluated. The results of the current study showed that the fine facewash.

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Conflicts of interests

The authors declare no conflict of interest.

Consent for publication

Not applicable.

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