



Review Article

Bel Patra Leaves in Skincare: A Review of Their Applications in Herbal Face Wash Formulations

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ABSTRACT

Research into natural skincare formulations was prompted by the growing demand for herbal cosmetics products, which are thought to be safe and effective. The creation and assessment of a herbal face wash using extracts from Bel Patra (*Aegle marmelos*), which is well-known for its therapeutic qualities, is the main focus of this study. Because of its abundance of antioxidant, anti-inflammatory, and potent antimicrobial/antibacterial compounds, Bel Patra is a great option for treating acne and other skin conditions, which are a common issue, particularly among teenagers.

The active ingredients were extracted from Bel Patra leaves and added to a face wash or anti-acne gel base for the formulations. In one particular formulation, Bael Patra was combined in a synergistic way with aloe vera (for hydration and relaxation), eucalyptus and turmeric oils (for antiseptic and antibacterial qualities), glycerine and vitamin E (as moisturisers and antioxidants), lemon juice (as a natural astringent), rose water (for toning), and carbopol (as a gelling agent). Physical appearance, colour, consistency, measurement, pH, viscosity, spreadability, foaming capacity/foam stability, skin irritation tests, and stability studies were among the rigorous physicochemical and biological assessments performed on the prepared formulations. The best formulations had outstanding consistency, foamability, and long-term stability, according to study results. The prepared formulations underwent physicochemical analyses, such as viscosity, foam stability, and pH measurement. To evaluate the face wash's antimicrobial effectiveness, microbiological tests were also carried out.

Introduction

One of the oldest healthcare systems in the world is represented by India's herbal drug industry. The Vedas, which list a variety of plant-based treatments for both physical and mental illnesses, are a major source of information about the use of herbs in ancient India [1]. The Ayurvedic system is still widely used today and is described in ancient texts like the Charaka Samhita and Sushruta Samhita. Ensuring the safety, effectiveness, and quality of products derived from medicinal plants is becoming increasingly important due to the growing interest in herbal formulations worldwide [1]. Herbal formulations have become more popular in dermatology and cosmetology over the last ten years due to their perceived mildness, bioactivity, and fewer side effects when compared to synthetic formulations. It is growing in the global market. Turmeric (*Curcuma longa*), neem (*Azadirachta indica*), bel leaf (*Aegle marmelos*), Xanthium gum, methyl paraben, lemon juice, sodium lauryl sulphate, and sandalwood oil are among the ethanolic extracts. Following the preparation of the formulation, we assessed a number of factors, including pH, colour, odour, consistency, formability, washability, spreadability, and viscosity.

History

Bel patra (*Aegle marmelos*) has a relatively recent history in skincare, particularly in the form of contemporary commercial face wash, which has its origins in the ancient Ayurvedic practice. Conventional Use (Prehistoric Era) For

centuries, bel patra has been one of the most significant herbs in Hindu and Ayurvedic medicine.

- **Medicinal Properties:** Traditional texts and practices have long acknowledged the anti-inflammatory, antibacterial, and antifungal properties of leaves.
- **Topical Application:** Bel leaves have historically been ground into a paste with water and applied topically to treat a variety of skin conditions, including rashes, acne, small burns, and infections. This practice is still carried out today. It was thought to be beneficial for the general health of the skin due to its high antioxidant content.
- **Cultural Significance:** The bael tree is planted throughout the grounds of most temples because it is revered in Hinduism. The plant has long been connected to holistic health practices because their leaves are offered to Lord Shiva, symbolising purity and wellbeing [6].
- **Modern Development (Recent History)**
- Since natural, herbal, and Ayurvedic-based cosmetics are thought to have fewer side effects than synthetic ones, their introduction as a commercial face-wash ingredient is a continuation of the current trend.
- **Scientific Validation:** In more recent times, primarily in the late 20th and early 21st centuries, scientific research has examined and validated these traditional claims. *Aegle marmelos* extracts are appealing in contemporary skincare applications because the active principles

responsible for antimicrobial and antioxidant activities were supported.

- Formulation Studies: Bel patra face wash formulations have only recently been developed, mostly in the last ten years.

Bel Patar occurs in nature in India.



Bel Patar grows naturally throughout the whole Indian subcontinent, and mainly in.

- Uttar Pradesh
- Bihar
- Jharkhand
- Madhya Pradesh
- Chhattisgarh
- Rajasthan
- Odisha
- Maharashtra
- Some parts of South India: Tamil Nadu, Karnataka.

This plant enjoys growing in dry and hot climates, being resistant to drought. It makes the plant very common and naturally abundant in India.

Agricultural Presence (Cultivation in India)

Cultivation of bel is gradually increasing in India due to rising demand in Ayurveda and herbal industries.

- Farmers grow Bel trees
- Low maintenance.
- High rate of survival.
- It can thrive on poor soils

Leaves, fruits, bark-all of these have market value. Government medicinal-plant schemes also support its farming. Water covers more than 70 percent of the Earth.

Ayurvedic Presence in India

Bel Patar is used in many ailments in Indian Ayurveda, including:

- Gastrointestinal disorders.
- Inflammation.

- Diabetes management.
- Skin infections.
- Boosting immunity.
- Diarrhea / dysentery.
- Heart health.[1]

Skin: Structure and Function.

The largest organ in the body, the skin serves as the first-order physical barrier against the outside world and forms the outermost layer of protection. It controls body temperature, keeps the body from becoming dehydrated, and shields the body from harmful substances, UV rays, and microbes. Through specific cells and receptors, the skin also performs immunologic and sensory functions.

Layers of the Skin

The skin consists of three major layers

Epidermis – The outermost layer composed mainly of keratinocytes. It provides a waterproof barrier, generates new skin cells, and contains melanocytes responsible for skin pigmentation.

Dermis – The middle layer rich in collagen and elastin fibers, which provide strength, elasticity, and flexibility. It houses nerves, hair follicles, sebaceous glands, and sweat glands.

Hypodermis (Subcutaneous Layer) – The innermost fatty layer that cushions underlying tissues, insulates the body, and connects skin to muscles and bones.

The surface of the skin displays complex patterns of ridges and pores formed by sweat gland openings and hair follicles. These microscopic features are unique to each individual, making dermatoglyphics (fingerprints) a reliable tool for personal identification of skin layer[2]

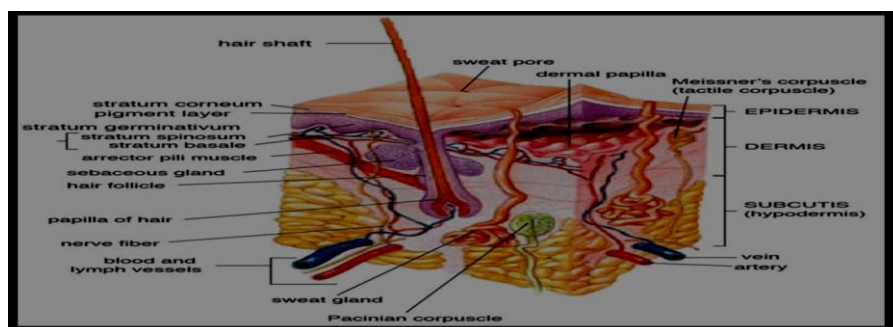


Fig 1-: Layers of skin

Skin Types and Common Disorders

Skin can be classified as dry, oily, normal, or combination, depending on the amount of sebum produced by sebaceous glands. Among the most common skin disorders is acne vulgaris, a chronic inflammatory condition of the pilosebaceous unit.

Acne Vulgaris

Acne vulgaris is characterized by the presence of non-inflammatory lesions (open and closed comedones) and inflammatory lesions (papules, pustules, and nodules). It primarily affects areas with dense sebaceous follicles, such as the face, upper chest, and back. The pathogenesis of acne involves four key factors.

1. Follicular hyperkeratinization and plugging of the pilosebaceous duct.
2. Excessive sebum production.
3. Colonization by *Cutibacterium acnes* (formerly *Propionibacterium acnes*).
4. Inflammatory response within the follicle[3]

Acne often leads to erythema, pain, and tenderness and can cause permanent scarring and psychological effects such as anxiety and depression. Although the condition usually subsides in men by early adulthood, it may persist in women into their 40s. Safe, effective, and gentle topical agents—such as herbal cleansers—are therefore highly desirable in acne management.

Aegle marmelos (Bel Patra): Botanical and Cultural Background

Aegle marmelos (L.) Correa, commonly known as Bel, Bael, Bilva, or Stone Apple, belongs to the family Rutaceae. It is a sacred and medicinally valuable tree native to India and widely distributed across Southeast Asia. The tree is revered in Hinduism and frequently associated with Lord Shiva; its trifoliate leaves, called Tripatra or Bel Patra, are offered during worship rituals. Historical records such as the Yajurveda, Mahabharata, mention Bel spiritual and medicinal significance.

Botanically, Aegle marmelos is a medium-sized, spiny tree (12–15 m tall) with trifoliate aromatic leaves and hard, woody fruits. It is also valued for its timber, gum, and dye-yielding properties. In Ayurveda, all parts of the plant (root, bark, leaves, fruit, and seeds) are used in the form of Panchang[3]

Medicinal and Pharmacological Properties of Bel Patra

The Bel tree is rich in bioactive compounds, including marmelosin, psoralen, lupeol, marmin, aegeline, and various flavonoids and tannins. These compounds contribute to a wide range of pharmacological effects, such as:

1. Antimicrobial and antibacterial
2. Antioxidant and anti-inflammatory
3. Antidiabetic and antihyperlipidemic
4. Hepatoprotective and gastroprotective
5. Analgesic and wound-healing [4]

Due to its antimicrobial and astringent properties, Bel Patra extract has been incorporated into herbal cosmetic formulations such as face washes, gels, and creams aimed at treating acne and maintaining skin hygiene. The extract's mild cleansing and soothing activity, combined with its ability to control bacterial growth, make it ideal natural ingredient for skincare formulation [16].

Botanical description of Aeglemarmelos

Aegle marmelos is a spinous, slow-growing, medium sized tree belonging to the family Rutaceae. The plant grows up to

the Height of 12-15 m and 90-120 cm in girth. The trunk is short, thick, soft, flaking bark with spreading spiny branches. Spikes Present are long, sharp and axial.

Leaves

The leaves of A. marmelos are alternate, trifoliate, aromatic, Deciduous borne as single or compound and comprises of 3 to 5 Oval, pointed shallowly, thin toothed leaflets with length 4-10 cm And 2-5 cm in width, terminal one have long petiole while the Lateral one is without a petiole. Leaves are composed of 3 to 5 Leaflets. Leaf petiole is long and glorious. Mature leaves possess A disagreeable odour when bruise.

Flower

Flowers are fragrant, 2 cm wide, erect, stalked, sweet-scented and formed a cluster of about 4 to 7 flowers, 4 to 5 recurved fleshy petals, yellowish from inside and greenish from outside with 50 or more greenish stamens. The calyx is shallow with five short broad teeth, capitate stigma ovary is oblong-ovoid and has slightly tapering thick short style.

Fruit

Fruits are round, aromatic, pale orange, fibrous oval, oblong, pyriform up to 5-20 cm in diameter and contain a hard, smooth-woody shell i.e. pericarp. In the early stages, the crust is gray-green which turns orange or yellowish when matured and becomes very hard and orange-red when dried. The hard central core with 8 to 20 indistinctly apparent triangular segments with thin dark orange walls is present inside the fruit .

Skin care preparation

Incredible progress has been made in the creation of skincare products. Individuals protect their Bodies, make themselves seem better, and avoid body odor by using a range of skin care products, Including foot powder, lipstick, mouthwash, and complexion creams. Skin care preparations are defined as substances intended to be rubbed, poured, sprinkled, sprayed, or otherwise applied to the human body or any part thereof to cleanse, beautify, promote attractiveness, or alter the appearance of the skin. The Ayurvedic system of medicine has long emphasized the use of natural herbs such as Haldi (turmeric), Amla (Indian gooseberry), Neem, and Bel Patra (Aegle marmelos) in cosmetic and skincare formulations. These herbal ingredients are known for their healing, purifying, and rejuvenating properties, making them suitable for both preventive and restorative skincare. Historically, however, synthetic or unsafe materials were sometimes used; for example, in eighteenth-century Europe, women applied lead carbonate to whiten their skin, unaware of its toxic effects .

Benefits of Facial Wash

It keeps skin youthful and healthy by assisting in the removal of dead skin cells. Removes dirt, oil, and impurities that accumulate on the skin throughout the day. Helps to prevent breakouts by removing excess oil and unclogging. Regular use of a suitable face wash helps to prevent clogged pores, acne breakouts, and other common skin problems such as irritation, inflammation, and dullness. Many formulations contain exfoliating agents that assist in the gentle removal of dead skin cells, resulting in a smoother and more radiant complexion. Consistent use improves overall skin texture and tone, leaving the face clean, refreshed, and rejuvenated. Moreover, cleansing the face properly allows other skincare products—such as moisturizers, serums, and sunscreens—to be better absorbed

and deliver enhanced benefits. The simple act of washing the face not only promotes healthier skin but also provides an immediate sense of freshness and revitalization[5]

Properties of face wash

Anti-acne and antibacterial: The main active ingredient, bel patra, has strong antibacterial properties that help fight the bacteria causing acne.

Anti-inflammatory: It can help reduce inflammation, making it beneficial for skin conditions like rashes and blemishes.

Antioxidant: The extract contains antioxidants that protect the skin from damage.

Non-irritating: Studies have shown that formulations with bel patra are non-irritating to the skin.

Stable: Formulations have been developed to be physically and chemically stable over time.

Skin-friendly pH: A well-formulated bel patra face wash has a pH level between (5.5\ and \7), which is compatible with the skin's natural balance.

Soothing and healing: Bel leaf extracts can help heal skin rashes and soothe itchy skin. Other ingredients like aloe vera are often added for extra calming and hydrating effects [6]

Uses of face wash

- **Gel Facewash**
The clear gel face wash is perfect for sensitive, oily, and acne-prone skin. Gel cleansers for deep cleansing glide onto the skin, removing excess sebum from the pores while nourishing and unclogging every part of your skin without being too harsh. It is important to find a gentle gel face cleanser that will keep the skin feeling moisturized and fresh at all times, such as a vitamin C gel face wash.
- **Cream face wash**
A cream face wash generally contains moisturizing elements like milk or honey and, therefore, is thicker in consistency. Lotion or cream-based cleaners can deeply clean your skin while giving it the right amount of hydration. Their thicker and stronger consistencies are ideal for all skin types, especially dry, mature skin in winter. They can be used to remove makeup. If you would prefer

1. Bal Patar as facewash:-

double cleansing, the cream face wash is an excellent option for your second cleansers.

- **Foam face wash**
Combination skin types are most benefited by the foam cleanser as it is midway between gel and cream cleansers. They may start off like a cream or gel and rapidly build into a thick foam. Gel facewashes are not quite effective in removing extra oil as the foam cleansers do. The skin feels rejuvenated and super light with the foaming particles lifting grime, dirt, and impurities. However, foam cleansers strip skin off its essential oils, so make sure you moisturize your skin amply after using on face wash.
- **Micellar cleanser** the lightest type of cleanser is called micellar water, and it appears and feels just like regular water. Comprising little oil molecules, it lifts makeup, oil, and dirt like a magnet-whether rinse-free or not. This cleanser formula is mild, gentle yet effective for all kinds of skin. This multi-action product cleanses, tones, and removes makeup from your skin effectively
- **Bael leaves:** Aegle marmelos tree is considered very sacred in India, where the three prongs of its leaf are said to represent Shiva's trident. In fact, the three prongs also relate to the three roles of creation, preservation, and destruction. A very long time was spent using the plant medicinally and for culinary purposes.
- **Bael or Bell Correa, Aegle marmelos (Lin) Correa,** is a medium-sized, slender, aromatic tree in the Rutaceae family. Native to India, it grows extensively in Bengal, central and southern India, the Himalayas, and other parts. Leaves and wood are used very frequently for worship and are commonly planted in close proximity to Hindu temples. Its branches carry straight, sharp.
- **Bel Patra (Aegle marmelos),** a sacred and medicinal plant in Ayurveda, possesses numerous therapeutic properties that make it highly valuable in herbal skincare formulations, especially in face washes. A face wash prepared from Bel Patra extract provides both cleansing and healing benefits, making it suitable for various skin types .

Fig2:- Face wash.



Herbs In face wash

Family

Biological Source: Bel patra comes from the Bel or Bael tree, scientifically known as Aegle marmelos. It's a deciduous tree native to India and cultivated in various parts of Southeast Asia .

Family: Rutaceae, **Geographical Source:** The Bel tree is primarily found in India, particularly in the northern and central regions. It's also cultivated in other parts of Asia, including Bangladesh, Sri Lanka, Nepal, and Thailand [7]

Chemical Constituents;

- Alkaloids, Organic compounds containing nitrogen, alkaloids are known for their pharmacological effects
- Alkaloids like aegeline, marmeline, skimmianine, and N-methylflindersine.
- Flavonoids: These plant secondary metabolites are known to exert an antioxidant action. Some examples of flavonoids in Bel patra include rutin, quercetin, and kaempferol contribute to its antioxidant as well as anti-inflammatory effects.
- Phenolic Compounds: It is rich in phenolic compounds like phenolic acids and flavonoids. These compound the antioxidant, anti-inflammatory, and antimicrobial activities.
- Tannins: Bel patra contains tannins, which are polyphenolic compounds with astringent properties. Tannins contribute to the herb's performance of capability of treating diarrhea and other gastrointestinal disorders through the tightening of mucous membranes.

Types of bel patar face wash

Typical Formulation Details (based on research)

- Research on using Bel Patra (Aegle marmelos) extract in face-washes gives a good guide of what the ingredient profile might look like:

- Main active: Bel Patra leaf extract (Aegle marmelos) - known for antibacterial, anti-inflammatory properties. Supporting actives for one study: aloe vera (soothing), turmeric oil, eucalyptus oil, vitamin E, glycerine and lemon juice in a gel base.
 - Surfactants/cleansing base: Gel or liquid formulation containing typical cleanser surfactants plus a gelling agent to hold the consistency, for example, carbopol in the study.
 - PH/feel: A good formulation will aim for skin-friendly pH (~5.0-6.0) and avoid over-stripping; in research, the emphasis is on non-irritating
- Examples of Concrete Product Here are a couple of products that come close, either a face wash from a brand using the "Bael/Bel" concept or some related Ayurvedic cleanser note they may not say specifically "Bel Patra face wash" but are relevant
 - Here's the breakdown: Kumkuma Radiance Face Wash: This is explicitly a product from The Bael Tree brand. Although the name is "Kumkuma Radiance", the formulation will be Ayurvedic/herbal. It may include Bel-tree or an Ayurvedic tree concept branding. According to a brand blog, it "purifies, nourishes and enhances your skin's natural glow" with Ayurvedic botanicals .

Table 1:-Bel Patar Face Wash Range For Clean and Organized

Product Name	Key Ingredients	Best Skin Type	Benefits	Notes
Bel Patar Acne Control Face Wash	Bel Patar Acne Control Face Wash	Acne-prone skin / frequent breakouts	Helps reduce pimples and bacterial growth mild exfoliation from salicylic acid	Check salicylic acid strength ($\leq 2\%$) ; avoid if skin is very sensitive ; always patch test
Bel Patar Bright & Glow Face Wash	Patra + vitamin C / niacinamide / herbal brightening blend	Dull / uneven-toned skin; post tan	Gently brightens complexion and helps fade marks with regular use ; refreshing feel	Brightening takes time (2-3 weeks) ; watch for tingling or irritation from vitamin C
Bel Patar Gentle Herbal Face Wash	Bel Patra + aloe vera + mild surfactants	Bel Patra + aloe vera + mild surfactants Dry / sensitive skin; daily use	Soft-foam or gel texture; soothing, non-stripping; best for morning or evening wash	May not fully remove heavy makeup or SPF — use a double cleanse for that
Bel Patar Detox & Repair Face Wash	Bel Patra + green tea / turmeric / licorice	Stressed/ polluted skin exposure	Detoxifies skin surface and adds natural radiance ; anti-inflammatory support	Check for added fragrance if you have allergies ; may tingle slightly at first use
Bel Patar Hydration Boost Face Wash	Bel Patra + hyaluronic acid + glycerine + rose water	Dry / normal skin needing hydration	Moisturising feel even after wash ; non-foaming gel formula	Store in cool place ; avoid hot water rinses to maintain hydration

Ideal properties of herbal face wash

- It should maintain the skin's natural pH balance so as not to cause irritation and dryness.
 - The product must be environmentally sustainable.
- It contains natural ingredients from botanical extracts, essential oils, and herbs that are known for their skin-nourishing properties .[9]
- Aromatherapy offering soothing and calming effects.
- Clogged pores can be avoided and reduce the chances of acne and outbreaks.
 - It should not be difficult to spread without pulling.

- It should not feel slippery or greasy when applied .

Benefits of herbal face wash

- Helps in maintaining clear and healthy skin.
- It makes the skin shine brighter.
- Regular exfoliation of pores helps prevent all skin-related problems.
- It removes the dead skin cells to reduce the formation of wrinkles on the skin.
- Suitable for all skin types.
- Variety of choices.

- Fewer side effects than synthetic face wash [10]

Advantages of herbal cosmetics over synthetic cosmetics.

These remedies are increasingly favoured as most women tend to choose natural products over chemical alternatives for their personal care in order to enhance their beauty, as these products nourish the body, improve health, and offer satisfaction. These products contain no synthetic chemicals and have comparatively fewer side effects related to synthetic cosmetics .

- Compatible with all skin types: - Herbal cosmetic is suitable for all skin types. Foundation, eyes hadow, and other herbal cosmetics lipstick, whether you have fair or dark complexion. They are also safe for us women with sensitive or oily skin, so women they never have to worry about aggravating their skin. Coal tar color is made synthetically from coal tar. Coal tar is also known as a human Carcinogen. However, natural colours made out of herbs are much safer and secure.
- Wide choice to select from: - While they may still be relatively new in the business of beauty, natural cosmetics already offer a Beauty products vary for every makeup user. Foundation, eye shadow, and lip balm come in many naturally made choices . Shadow, lipstick, blush, mascara, concealer, and much more [39]. Besides, one can get natural cosmetics produced locally or ones created by internationally renowned designers. Many different herbal extracts are available; some examples are AndrographiPaniculata (Kalmegh), Asparagus Racemosus (Shatawari), Boswellia Serrata (SalaiGuggal), Asphalt (Shilajit), and so on .[11-13]
- Natural cosmetics fit your budget: -The sales, they get sold at low prices and are offered at a discount. You just have to survey enough to find good discounts. An estimate by the WHO puts that 80% of people on the planet trust on natural product for their medical needs due to the negative effects and growing expense of conventional treatment and it is also more safer than synthetic product with less side effect Currently, the World Health Organization supports and encourages traditional herbal remedies in natural health care programs. Since they are generally safe and available at low cost [14]
- Not tested on animals: -To determine their safety and effectiveness for human use, certain cosmetics are tested on animals during the preliminary phases. However, animal testing is not required in natural cosmetics. Experts evaluate these natural formulas, using the latest technology, without using any animals.
- No Side Effects: -The cosmetics may irritate your skin and cause breakouts. They may also block your pores and that leave your skin feeling greasy or dry. You don't have to worry about these with natural cosmetics. Herbal cosmetics, for example, are free of parabens, the Oral isotretinoin, also known as Accutane, is only recommended for extremely severe, deformity-causing acne [11]

Conclusion

It is written in a clear scientific tone, connects all sections of your text, and gives a strong closing to a research article, review article, thesis, or herbal formulation study.

The paper points to Bel Patra leaves as a highly potential natural ingredient for herbal face wash formulation, which is safe and effective. Due to its strong antimicrobial, anti-

inflammatory, antioxidant, and astringent activities, Bel Patra acts like a multifunctional herbal agent that can tackle a number of common skin problems, especially acne, bacterial infections, excessive oil secretion, and skin irritation. The traditional Ayurvedic importance of Bel Patra, along with increasing scientific validation, stands as a key therapeutic plant for modern skincare applications.

The formulation prepared using Bel Patra extract, along with other supportive natural ingredients such as aloe vera, turmeric oil, eucalyptus oil, glycerine, vitamin E, lemon juice, rose water, carbopol demonstrated excellent physicochemical stability, including desirable pH (5.5–7.0), viscosity, consistency, washability, spreadability, and foam stability. It was established that the formulation is non-irritating, pleasing, and has an easy flow, making it suitable for application. Results from antimicrobial testing further confirm that Bel Patra provides significant antibacterial activity, particularly against microbes believed to cause acne, such as supporting its inclusion in anti-acne skincare.

Herbal cosmetics gain in acceptance worldwide due to their safety profile, biocompatibility, fewer side effects, and high consumer preference over synthetically formulated products. The Bel Patra-based face wash formulated in the present study falls in line with the global trend towards natural and sustainable skincare. Unlike chemical-based cleansers, herbal face wash protects the skin barrier, maintains natural pH balance, and nourishes the skin without drying out or causing long-term damage

This research also underlines the abundance and rich cultivation history of Bel Patra in India, along with its long history of application in Ayurveda to remedy gastrointestinal, dermatological, and immunomodulatory ailments. The presence of important phytochemicals such as flavonoids, alkaloids, tannins, and phenolic compounds enhances its therapeutic potential. These bioactive compounds thus contribute collectively to skin cleansing, detoxification, control of sebum, and prevention of microbial growth. Overall, the findings of this study strongly suggest that Bel Patra-based herbal face wash is a promising, cost-effective, and environment-friendly alternative to synthetic cleanser. The Bel Patra herbal face wash is a promising and viable option for natural skincare, hence further exploration and potential commercialization should be carried out. It is a stable, effective, and safe herbal formulation for treating acne and maintaining healthy skin because of its antibacterial effects and the ability to exfoliate dead skin cells. Further research and standardization of these Bel Patra formulations will have the potential for development into commercially viable skincare products with high consumer acceptance in both national and international markets. Therefore, Bel Patra represents a valuable herbal resource that effectively bridges traditional Ayurvedic wisdom with modern cosmetic science, making it an excellent candidate for future innovations in natural skincare formulations.

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