



International Journal of Zoology, Environment and Life Sciences

Content Available at www.lapinjournals.com ISSN (O): 2048-9598
(An International online peer reviewed Referred Journal)



Review Article

Open Access

BEETROOT IN MODERN HERBAL COSMETOLOGY: MULTIFUNCTIONAL FACE PACKS FOR HEALTHY, GLOWING SKIN

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Article History: Received: 11 Aug 2025, Revised: 27 Sept 2025, Accepted: 12 Oct 2025

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DOI: <https://doi.org/10.70604/ijzels.v2i3.97>

Abstract

Beetroot (*Beta vulgaris* L.) is a widely consumed root vegetable valued for its nutritional, medicinal, and cosmetic applications. In recent years, its use in herbal face pack formulations has gained attention due to its rich phytochemical profile, including betalains, flavonoids, polyphenols, and vitamin C, which contribute to antioxidant, anti-inflammatory, and skin rejuvenating properties. This review highlights the role of beetroot in skincare, focusing on its ability to brighten complexion, reduce pigmentation, control acne, delay premature aging, and provide natural hydration. In addition, when combined with other herbal ingredients such as honey, aloe vera, Multanimitti, and sandalwood, beetroot-based formulations exhibit synergistic effects in managing diverse skin types including oily, dry, sensitive, and mature skin. Literature from peer-reviewed journals, books, and research articles was systematically analysed to summarize the dermatological potential of beetroot and its formulations. Overall, beetroot face packs represent a safe, effective, and natural alternative to chemical-based cosmetics, supporting their potential as functional skincare agents.

Keywords: Beetroot, Herbal face pack, Antioxidant, Skin health, Pigmentation, Anti-aging

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Introduction

According to the Drugs and Cosmetics Act of 1940 and the Rules framed in 1945, a cosmetic is any substance or product intended for external use on the human body or parts, whether by application, sprinkling, pouring, rubbing, or spraying, with the purpose of cleansing, beautifying, enhancing attractiveness, or modifying appearance. This definition also encompasses materials that serve as ingredients in cosmetic formulations [1].

Herbal cosmetics have gained wide popularity in recent years due to their safety, efficacy, and holistic approach in promoting skin health [2].

Everybody wants to get fair and charming skin. Today, skin issues such as acne, blackheads, pimples, and dark circles are commonly observed in young people and those affected. In Ayurveda, skin disorders are primarily attributed to impure or contaminated blood. 'Mukha Lepa' is the term in Ayurveda for a herbal paste applied to the face to treat acne, pimples, scars, marks, and pigmentation [3]. Herbal-based treatments have now gained widespread

use in modern skincare. used as therapeutic agents because of their availability, affordability, and lack of toxicity [4]. A face pack is a smooth powdered formulation designed for facial use. When mixed into a paste or liquid and applied to the skin, it dries to form a thin film. Historically, such preparations were valued as traditional beauty treatments. towards impressing others with their looks; at the time there were no fairness creams or any cosmetics surgeries to modify the appearance [5].

Among various natural ingredients, beetroot (*Beta vulgaris*) has attracted interest in skincare applications. Traditionally consumed as a vegetable and therapeutic agent, beetroot contains high levels of phytochemicals including betalains, flavonoids, ascorbic acid, carotenoids, and polyphenols [6]. These compounds provide a broad spectrum of pharmacological activities such as antioxidant, anti-inflammatory, detoxifying, and anti-aging effects [7].

In cosmetic formulations, particularly herbal face packs, beetroot not only serves as a natural coloring and

antioxidant agent but also provides added benefits like hydration, skin brightening, acne control, and nutritional support [8]. Therefore, beetroot is considered as a multifunctional herbal cosmetic ingredient with applications extending beyond its antioxidant role. Formulations of nutraceutical cosmetics serve to manage skin-related issues while also improving aesthetic appearance. Among them, beetroot (*Beta vulgaris*), often referred to as red beet, holds significant importance [9].

This root vegetable, classified under the Amaranthaceae family, is extensively used as food, medicine, and in cosmetic formulations, and has drawn attention in herbal cosmetology for its high vitamin (A, C), The combined action of minerals like iron, potassium, and magnesium helps maintain healthy, rosy skin. It has a lot of antioxidants, flavonoids especially betalains which makes it a fantastic anti-aging element from a beauty perspective. others include increased collagen production reduce inflammation, main skin hydration and minimize the dark spot and brightens skin, minimizes acne and blemishes; eliminates fine lines and wrinkles; and evens out and maintains the suppleness [7, 10].

When formulated as a face pack beetroot provides skin-enhancing properties such as brightening, anti-aging, acne control, and hydration. Its natural pigments (betalains) and phytonutrients make it a valuable ingredient in herbal face formulations. When applied topically in the form of a face pack, beetroot serves as a natural and safe alternative to synthetic cosmetics, making it an attractive ingredient for herbal skincare formulations.

An effective herbal face pack should provide the essential nutrients required for healthy skin [11].

In today's world, the cosmetic industry is rapidly shifting towards herbal and natural formulations due to the harmful effects of synthetic products. Among various herbal ingredients, beetroot (*Beta vulgaris*) has emerged as a valuable source for both nutrition and skincare. The powdered form of beetroot, known as beetroot face powder, is rich in bioactive compounds and serves as a natural, safe, and cost-effective skincare option. Beetroot is a potent source of antioxidants, which help in delaying the onset of fine lines and reducing wrinkle formation. The combined action of antioxidants and folates contributes to minimizing visible signs of aging. These benefits may be derived either through regular consumption of beetroot juice or by applying beetroot paste directly to the skin. Furthermore, beetroot juice functions as a natural detoxifier by eliminating toxins from the body and purifying the blood. The result is an instant glow.

The iron present in beetroot juice, when consumed, helps in the repair and rejuvenation of damaged cells from within. There by, it gives an instant glow to the dull skin and improves the skin complexion [12]. The natural face packs are pretty simple to use and less complicated [13].

Removing a face pack helps in clearing away dirt and dead skin cells, while herbal face packs contribute to improved skin fairness and a smoother texture [14].

Herbal face packs work best when used according to individual skin types. They help in brightening the skin and serve as a trusted Ayurvedic method for enhancing fairness. Typically, face packs are left on the skin for 20–25 minutes to allow moisture to evaporate, forming a thin layer that tightens, hardens, and can be easily peeled off.

Beetroot Benefits

1. lightens pigmentation, reduces blemishes, and promotes an even complexion [15].
2. Hydrates and Nourishes Skin – High water content and minerals prevent dryness, flakiness, and keep skin soft [16].
3. Fights Acne and Controls Oily Skin – Its anti-inflammatory and antibacterial properties reduce pimples while balancing excess sebum [17].
4. Delays Signs of Aging & Improves Elasticity – Antioxidants and vitamin C boost collagen, prevent fine lines, wrinkles, and sagging [18].
5. Reduces Dark Circles and Puffiness – Enhances under-eye circulation and minimizes swelling [19].
6. Boosts Blood Circulation for Natural Glow – Nitrates in beetroot improve oxygen supply to skin, giving a radiant glow [17].
7. Detoxifies and Purifies Skin – Betalains flush out toxins, reducing breakouts and enhancing skin health [18].
8. Gives a Rosy-Pinkish Glow – Natural pigments impart a fresh, pink tint to the skin [20].
9. Protects Against Sun Damage – Antioxidants help neutralize UV-induced oxidative stress and prevent sun-related damage [15].
10. Soothes Irritated Skin – Anti-inflammatory compounds reduce redness, itching, and sensitivity [17].
11. Acts as a Natural Cleanser & Gentle Exfoliant – Removes impurities, dirt, and dead skin cells for smooth, radiant skin.

Materials and Methods

Requirements

Slicer, tray dryer, grinder, sieve, muffle furnace, pH meter, packaging bottles

Method

Method for preparation of Beetroot powder

Step 1

Fresh roots of *Beta vulgaris* (family: Amaranthaceae) weighing 500 g are selected as the primary raw material. Authentication is performed through pharmacognostic evaluation, including macroscopic and microscopic examination. Organoleptic properties such as color (deep red to purple), odor, and taste are also recorded. Foreign matter testing is conducted to eliminate soil, stones, and other impurities, ensuring that only genuine and clean plant material is used

Step2

The authenticated roots (500 g) are washed thoroughly with potable or distilled water to remove dirt, pesticides, and microbial contaminants. A mild saline (0.9% NaCl) or 70% ethanol wash may be used for surface sterilization. The cleaned roots are then sliced into uniform pieces using a stainless-steel slicer to facilitate effective drying and minimize enzymatic degradation.

Drying Step3

Fresh beetroot slices (500 g) Spread the beets on a parchment-lined baking sheet and leave them on a sunny windowsill for at least 48 hours, and after that grind them into a powder using a blender (3). Drying is continued until constant weight is achieved. The dried material obtained weighs approximately 100–125 g (20–25% of the fresh weight). The moisture content is checked by Loss on Drying (LOD) analysis, ensuring it remains below 10%. This process prevents microbial growth, maintains stability, and enhances the shelf-life of the powder.

Step 4: Size Reduction and Sieving

The dried beetroot slices (100–120 g) are subjected to pulverization using a grinder or hammer mill to obtain a fine powder. The powder is subsequently passed through a mesh sieve 80 or 100, Final powder yield 80–100 g. Following pharmacopeial standards, the powder is processed to achieve a uniform particle size. This ensures smooth texture, better cosmetic appeal, and uniform distribution enhanced spread ability when applied to the skin.

Step 5: Packaging

The final beetroot face powder is packed in airtight, moisture-proof, and light-resistant containers, such as laminated pouches, HDPE bottles, or amber glass jars. Packaging under controlled conditions prevents oxidation and moisture uptake, thereby preserving the stability and effectiveness of the active constituents.

Method

Procedure for Applying Face Pack

1. Place the specified quantity of beetroot face pack powder into a clean bowl.
2. Add rose water / plain water / aloe vera gel / milk / honey depending on skin type.
3. Mix into a smooth paste.
4. Apply evenly over the facial skin, covering acne and blemish-prone areas.
5. Leave for 20–25 minutes until fully dry.
6. Wash the face with cold water.
7. The figure no:1 show the mixture of ingredients for face pack



Fig 01: Beetroot Face Pack According to Skin Type

Table 01: Skin benefits of various ingredients

SKIN TYPE	INGREDIENTS	BENEFITS
Oily / Acne-Prone	Beetroot + Multani mitti + Lemon	Controls excess oil, unclogs pores, reduces acne & pigmentation [21].
Dry Skin	Beetroot + Honey + Aloe vera gel	Provides hydration, prevents dryness, enhances skin softness [22].
Combination Skin	Beetroot + Yogurt + Sandalwood powder	Balances oiliness and dryness, soothes irritation, brightens complexion [23].
Sensitive Skin	Beetroot + Cucumber pulp + Rose water	Calms irritation, reduces redness, provides cooling effect [24].
Normal Skin	Beetroot + Gram flour + Milk	Improves skin glow, evens skin tone, natural cleansing action [25].
Anti-Aging / Mature Skin	Beetroot + Yogurt + Vitamin E	Reduces fine lines, improves elasticity, and promotes youthful appearance [26].
Tan Removal / Brightening	Beetroot + Orange peel powder + Aloe vera	Minimize fine lines, improve skin elasticity, and maintain a youthful glow [27].

Precautions to Be Taken While Applying Facemask

Select the face pack according to your skin type. If you have any serious skin concerns, take opinion of natural therapist or concerned skin expert before applying face pack. The face pack should not be left on face more than 20 to 25 mins. Prolonged application may cause wrinkles, and enlarged pores. Don't try to peel or scratch the dried face pack.



Fig 02: shows how to apply face pack

Evolution Test's

Organoleptic Evaluation

Table 02: Parameters for Organoleptic Evaluation

S.NO	PARAMETER	OBSERVATION
1	Nature	Powder
2	Colour	Redish brown
3	Odour	Pleasant
4	Appearance	Smooth
5	Texture	Fine

Physico-Chemical Evaluation (powder property) perform Total Ash content & acid insoluble ash was performed using Muffle furnace, pH was found by using pH meter and loss on drying & Flavonoid test (Shinoda test, alkaline reagent test, Lead acetate test, Ferric chloride test) was also performed. And Tapped Density, Bulk density, angle of repose, Carr's index pH, ash content was performed.

Table 03: Physico-Chemical Evaluation

S.no	PARAMETER	OBSERVATION
1.	Tapped Density	0.55 g/mL
2.	Bulk Density	0.43 g/mL
3.	Angle Repose	33.0°
4.	Carr's Index	21.8%
5.	pH	5.6
6	Ash	9.5%w/w
7	Loss on drying	6.2%w/w

Irritancy Test

Results of irritancy test the formulation showed absence of irritation, redness and swelling during irritancy studies. This formulation has safe to use on skin.

Table 04: parameters for Irritancy Test

S.NO	PARAMETRR	OBSERVATION
1	Irritation	No
2	Redness	No
3	Swelling	No

Stability Studies: To determine stability, the prepared formulation was stored for one month under varying

temperature conditions (room temperature and 40°C) and examined for changes in odour, pH, and consistency.

Washability: The formulation was applied to the skin, and its removal was tested using 1 litre of water. The assessment focused on the extent and ease of washing off the product.

Conclusion

The prepared beetroot-based herbal face pack demonstrates significant potential for skincare applications. Rich in vitamins and minerals, it helps in improving skin fairness, smoothness, and elasticity while reducing acne, pimples, scars, pigmentation, and other skin blemishes. The formulation is stable under different temperature conditions and exhibits good washability, making it practical for regular use. Moreover, it is safe for topical application, highlighting its suitability as a natural and effective cosmetic product in herbal cosmetology.

Acknowledgement

Not Declared

Conflicts of Interest

The authors declare no conflicts of interest.

Author Contribution

Both are contributed equally

Financial Support

None

Ethical Considerations and Inform Consent

Not Applicable

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