World Journal of Pharmaceutical Science and Research
www.wjpsronline.com
Research Article

ISSN: 2583-6579
SJIF Impact Factor: 6.916
Year - 2026
Volume: 5; Issue: 6
Page: 617-628

FORMULATION AND EVALUATION OF A POLYHERBAL LIP SCRUB: A SYSTEMATIC APPROACH TO PHYSICOCHEMICAL OPTIMIZATION AND SAFETY ASSESSMENT

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Article Received: 15 April 2026 | | Article Revised: 05 May 2026 | | Article Accepted: 26 May 2026

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How to cite this Article: Ajay Snjay Mule, Sakshi Vijay Bansode, Mamata Bhausaheb Thombre, Sarthak Bhausaheb Nidhane (2026) FORMULATION AND EVALUATION OF A POLYHERBAL LIP SCRUB: A SYSTEMATIC APPROACH TO PHYSICOCHEMICAL OPTIMIZATION AND SAFETY ASSESSMENT. World Journal of Pharmaceutical Science and Research, 5(6), 617-628.

ABSTRACT

Background and Rationale: Herbal cosmetics have attracted considerable scientific and commercial attention as alternatives to synthetic personal care products. The lip mucosa is anatomically distinct, lacking sebaceous glands and a conventional stratum corneum, rendering it highly susceptible to dehydration, photodamage, and hyperpigmentation. Lip scrubs represent a clinically meaningful cosmetic category, simultaneously providing mechanical exfoliation and emollient protection. Polyherbal formulations, guided by the Ayurvedic principle of synergism, offer multifunctional cosmetic benefits while minimizing the risk of adverse reactions. **Objectives**: The study aimed to (1) develop a stable polyherbal lip scrub using beetroot powder (Beta vulgaris), petroleum jelly, beeswax, sugar, orange essential oil, and vitamin E oil via the fusion method; (2) evaluate physicochemical, organoleptic, and safety parameters across seventeen systematically designed formulation batches; (3) identify the optimized formulation; and (4) assess short-term stability at 25°C and 40°C for 30 days. **Methods**: Seventeen batches (F1–F17) were prepared by varying ingredient concentrations within predefined ranges. Formulations were characterized for color, odor, texture, consistency, pH, spreadability, washability, homogeneity, and irritation potential. Stability was evaluated at Day 0, Day 15, and Day 30 under ambient and accelerated conditions. **Results**: All batches demonstrated acceptable physicochemical properties. Batch F17 — containing beetroot powder (2.0 g), petroleum jelly (12.0 g), beeswax (3.0 g), sugar (7.0 g), orange essential oil (1.0 mL), and vitamin E oil (0.5 mL) — was identified as the optimized formulation. It displayed reddish-pink coloration, pleasant citrus aroma, smooth texture with mild grittiness, semi-solid consistency, pH 6.0 ± 0.05, spread diameter of 3.8 cm, and easy washability. No cutaneous irritation was observed in ten human volunteers at 24 or 48 hours. The formulation remained stable at 25°C throughout the study period. **Conclusion**: The polyherbal lip scrub (F17) demonstrated excellent physicochemical, sensory, and safety characteristics, with synergistic contributions from each ingredient. This natural, biodegradable formulation shows strong potential as a safe and commercially viable lip care cosmetic.

KEYWORDS: Polyherbal lip scrub; Beetroot powder; Beta vulgaris; Fusion method; Betalain; Physicochemical evaluation; Stability study; Herbal cosmetics; Exfoliation; Vitamin E.

1. INTRODUCTION

The global cosmetic industry has undergone a paradigm shift over the past two decades, with consumers increasingly favouring nature-derived formulations over synthetically constituted products. Herbal cosmetics, defined as preparations incorporating plant-based bioactive constituents within a cosmetic vehicle, occupy a rapidly growing niche within this transition. The global herbal cosmetics market was valued at approximately USD 35 billion in 2022 and is projected to expand at a compound annual growth rate (CAGR) of 5–7% through 2030, driven by heightened consumer awareness of the potential toxicity of synthetic chemical additives, growing interest in sustainable product profiles, and the enduring legacy of botanical medicine across Ayurvedic, Unani, and Traditional Chinese Medicine systems.[1,2]

The lips represent a cosmetically and physiologically unique anatomical structure. Unlike the adjacent facial skin, the vermilion zone of the lips is covered by a thin, translucent stratified squamous epithelium that is entirely devoid of sebaceous glands, sweat glands, and a functional stratum corneum.[3] This anatomical deficiency renders the lip surface three to five times more susceptible to transepidermal water loss (TEWL) compared to perioral skin, predisposing it to chronic dryness, fissuring, hyperpigmentation, and ultraviolet (UV)-induced photodamage.[4] The absence of constitutive melanin-based photoprotection further exacerbates UV vulnerability. Extrinsic factors including environmental pollution, habitual lip-licking, nutritional deficiencies, tobacco use, and topical sensitizers in cosmetic products compound these structural vulnerabilities, resulting in a high prevalence of lip cosmetic concerns.[5]

Lip scrubs are semi-solid cosmetic preparations designed to address these concerns through a two-pronged mechanism: physical exfoliation of accumulated dead corneocytes via granular abrasives, and targeted moisturization through an occlusive emollient base. When formulated with herbal actives, lip scrubs additionally confer antioxidant, anti-inflammatory, skin-brightening, and antimicrobial benefits.[6] Despite a growing market for natural lip care products, scientifically validated polyherbal lip scrub formulations remain underrepresented in the published literature, particularly those subjected to systematic optimization and stability evaluation.

The present investigation was therefore designed to develop, optimize, and comprehensively evaluate a polyherbal lip scrub incorporating beetroot powder (Beta vulgaris L.) as the principal bioactive, supported by petroleum jelly, beeswax, sugar (sucrose), orange essential oil (Citrus sinensis), and vitamin E oil (tocopherol). The rationale for ingredient selection is grounded in their individually documented pharmacological and cosmetic properties, as well as the anticipated synergistic interactions within the combined formulation matrix. Beetroot powder contributes natural betalain pigmentation, potent antioxidant activity (ORAC value: 2.74 mmol Trolox equivalent/g betanin), and potential tyrosinase-inhibitory skin brightening.[7,8] Petroleum jelly and beeswax provide the structural emollient base; sugar serves as a biodegradable, humectant exfoliant; orange essential oil imparts fragrance and antimicrobial preservation; and vitamin E oil stabilizes the formulation against lipid peroxidation while providing cellular antioxidant protection in situ.[9–12]

Seventeen formulation batches were prepared using a systematic concentration variation approach, evaluated against a defined set of physicochemical, sensory, safety, and stability parameters, and the optimized batch (F17) was identified on the basis of holistic scoring. This work contributes to the growing body of evidence supporting the scientific development of plant-based cosmetic formulations and provides a validated prototype for a commercially viable polyherbal lip scrub.

2. MATERIALS AND METHODS

2.1 Materials

Beetroot powder (Beta vulgaris L., spray-dried; betalain content ≥ 2.0% w/w) was procured from a certified herbal extract supplier. Petroleum jelly (white petrolatum, USP grade), beeswax (Cera Alba, BP grade), and sucrose (granulated, food grade) were purchased from a local pharmaceutical raw material vendor.

Orange essential oil (Citrus sinensis, cold-pressed; d-limonene ≥ 85% by GC) and vitamin E oil (dl-α-tocopherol, cosmetic grade; assay ≥ 96%) were sourced from an authenticated essential oil supplier. All materials were used as received after identity verification. Purified water (resistivity > 1 MΩ·cm) was used for all aqueous preparations and pH measurements. All reagents and chemicals used were of analytical or pharmaceutical grade.

2.2 Formulation Design

Seventeen formulation batches (F1–F17) were designed by systematically varying the concentrations of key functional ingredients within predefined ranges: beetroot powder (1.0–2.0 g), petroleum jelly (10.0–12.0 g), beeswax (2.0–3.0 g), sucrose (5.0–7.0 g), orange essential oil (0.5–1.0 mL), and vitamin E oil (0.3–0.5 mL). Concentration ranges were established based on published literature values, published pharmacopoeial concentration guidelines for excipients, and the results of preliminary trial batches. The formulation matrix is presented in Table 1.

2.3 Preparation of Polyherbal Lip Scrub (Fusion Method)

The polyherbal lip scrub was prepared using the fusion method, as follows. Beeswax was accurately weighed and transferred to a clean porcelain evaporating dish. The dish was heated on a thermostatically controlled water bath maintained at 70–75°C until complete and uniform melting was achieved. Weighed petroleum jelly was subsequently added to the molten beeswax under continuous mechanical stirring using a glass rod, producing a homogeneous lipid phase. The lipid blend was removed from the water bath and allowed to cool with continuous stirring to approximately 50–55°C to prevent premature crystallization. Beetroot powder was then incorporated into the cooling lipid base with vigorous stirring to ensure uniform pigment dispersion and prevent particle agglomeration. Sucrose granules were added incrementally with constant stirring to achieve uniform distribution throughout the matrix. Finally, orange essential oil and vitamin E oil were added dropwise with continuous stirring over a period of 5 minutes to ensure complete incorporation. The homogeneous semi-solid mass was immediately poured into sterile, labelled cosmetic containers, allowed to cool undisturbed to room temperature (25°C), and sealed. Prepared batches were stored at 25°C and 40°C for subsequent stability evaluation.

2.4 Evaluation Methods

2.4.1 Organoleptic Evaluation

The color of each formulation was assessed visually by three trained observers under standardized fluorescent illumination against a matte white background. Odor was evaluated using a validated 5-point hedonic scale (1 = very unpleasant; 5 = very pleasant), and results were expressed as the mean score ± standard deviation (SD). Texture, grittiness, and overall consistency were assessed by tactile evaluation using the fingertip and recorded descriptively.

2.4.2 pH Measurement

A 10% w/v dispersion of the lip scrub in freshly prepared purified water was prepared by gentle stirring at 25°C. The pH was determined using a pre-calibrated digital pH meter (two-point calibration with certified pH 4.0 and 7.0 buffer solutions) at 25.0°C ± 0.5°C. Three independent measurements were recorded per sample, and the mean ± SD was reported.

2.4.3 Spreadability

Spreadability was determined by the parallel plate method. A defined quantity (2.0 ± 0.01 g) of the formulation was placed centrally on a clean, level glass plate (15 cm × 15 cm). A second glass plate of identical dimensions was placed on top, and a standardized load of 200 g was applied for 30 seconds. The diameter of the spread was measured in two perpendicular directions using a calibrated vernier calliper, and the mean was calculated. Each measurement was performed in triplicate.

2.4.4 Washability Assessment

Approximately 1.0 g of the formulation was applied uniformly to the inner forearm of a trained volunteer. After a 5-minute contact period, the area was rinsed with 200 mL of room-temperature purified water for 30 seconds. The test site was visually examined for the presence of residue, staining, and ease of removal and recorded descriptively.

2.4.5 Skin Irritation (Patch Test)

A modified single-insult patch test was conducted on 10 healthy adult volunteers (5 male, 5 female; age range 18–35 years) who had provided written informed consent. Volunteers with known dermatological conditions, allergies, or concurrent topical medication use were excluded. Approximately 0.5 g of the optimized formulation (F17) was applied to sterile cotton gauze (2 cm × 2 cm) and secured to the inner forearm of each volunteer using hypoallergenic micropore tape. Patches were maintained in situ for 24 hours, removed, and the test site was independently evaluated at 24 and 48 hours post-removal by a blinded observer for erythema, edema, papules, vesicles, or any other adverse cutaneous manifestation.

2.4.6 Homogeneity

Homogeneity was assessed both macroscopically and by light microscopy. A thin smear of each formulation was prepared on a glass microscope slide and examined at 100× magnification for uniformity of dispersion, particle size distribution of sugar granules, and absence of agglomerates, crystallization artefacts, or phase separation.

2.4.7 Stability Studies

Short-term stability studies were conducted on the optimized formulation (F17) according to principles analogous to ICH Q1A(R2) guidelines.[18] Sealed containers were stored at 25°C ± 2°C (ambient conditions) and 40°C ± 2°C (accelerated conditions). Physicochemical and organoleptic parameters were evaluated at Day 0 (initial), Day 15, and Day 30. Results at each time point were compared against the Day 0 baseline.

3. RESULTS AND DISCUSSION

3.1 Formulation Matrix

Seventeen formulation batches were prepared by systematic variation of ingredient concentrations, as summarized in Table 1. Early batches (F1–F6), prepared with the lowest beeswax concentration (2.0 g), yielded excessively soft, insufficiently structured formulations with poor physical stability and suboptimal consistency. Intermediate batches (F7–F12), incorporating beeswax at 2.5 g, demonstrated improved consistency but inconsistent spreadability and, in several cases, inadequate exfoliating intensity due to low sucrose content. Batches F13–F17, prepared with beeswax at

3.0 g and higher concentrations of sucrose and orange essential oil, collectively demonstrated the best-balanced physicochemical and sensory profiles.

Table 1: Formulation Matrix — Batches F1 to F17 (all weights in grams unless stated).

Batch	Beetroot Pwd (g)	Pet. Jelly (g)	eeswax (g)	Sugar (g)	Orange Oil (ml)	Vit. E Oil (ml)	Total Wt. (g)	Status
F1	1.0	10.0	2.0	5.0	0.5	0.3	18.8	Trial
F2	1.5	10.0	2.0	5.0	0.5	0.3	19.3	Trial
F3	2.0	10.0	2.0	5.0	0.5	0.3	19.8	Trial
F4	1.0	12.0	2.0	5.0	0.5	0.3	20.8	Trial
F5	1.5	12.0	2.0	5.0	0.5	0.3	21.3	Trial
F6	2.0	12.0	2.0	5.0	0.5	0.3	21.8	Trial
F7	1.0	10.0	2.5	5.0	0.5	0.3	19.3	Trial
F8	1.5	10.0	2.5	5.0	0.5	0.3	19.8	Trial
F9	2.0	10.0	2.5	5.0	0.5	0.3	20.3	Trial
F10	1.0	12.0	2.5	6.0	0.5	0.3	22.3	Trial
11	1.5	12.0	2.5	6.0	0.5	0.3	22.8	Trial
Batch	**Beetroot Pwd (g)**	**Pet. Jelly (g)**	**eeswax (g)**	**Sugar (g)**	**Orange Oil (ml)**	**Vit. E Oil (ml)**	**Total Wt. (g)**	**Status**
F12	2.0	12.0	2.5	6.0	0.5	0.3	23.3	Trial
F13	1.0	10.0	3.0	6.0	1.0	0.5	21.5	Trial
F14	1.5	10.0	3.0	6.0	1.0	0.5	22.0	Near-Optimal
F15	2.0	10.0	3.0	6.0	1.0	0.5	22.5	Near-Optimal
F16	1.5	12.0	3.0	6.0	1.0	0.5	24.0	Trial
F17	2.0	12.0	3.0	7.0	1.0	0.5	25.5	**Optimized**

3.2 Organoleptic and Physicochemical Evaluation

The complete physicochemical evaluation data for the optimized formulation, Batch F17, are presented in Table 2. The results demonstrate that F17 fulfilled all target product profile attributes with respect to appearance, sensory characteristics, pH, spreadability, safety, and homogeneity.

Table 2: Physicochemical Evaluation Summary — Optimized Formulation Batch F17.

Parameter	Method/Instrument	Observation / Result (F17)
Color	Visual inspection under fluorescent light	Reddish-pink (betalain pigment)
Odor	5-point hedonic organoleptic scale	Pleasant citrus aroma; score 4.6/5.0
Texture	Tactile evaluation (fingertip)	Smooth with mild, effective grittiness
Consistency	Visual + touch assessment	Semi-solid; easily scoopable
pH	Calibrated digital pH meter at 25°C	6.0 ± 0.05
Spreadability	Parallel plate method, 200 g load	3.8 cm diameter; Good
Washability	Rinse with 200 mL water, 30 s	Easily washable; no residue
Skin Irritation	24 h patch test, 10 volunteers	No erythema, edema, or reaction
Homogeneity	Visual + microscopy (100×)	Uniform; no phase separation
Melting Point	Capillary method	62–65°C (within specification)

3.2.1 Color and Pigmentation

All seventeen batches exhibited characteristic reddish-pink to deep pink coloration, directly attributable to the betalain content of beetroot powder. The color intensity exhibited a positive, concentration-dependent relationship with beetroot powder quantity; Batch F17, incorporating the maximum concentration (2.0 g), displayed the most vibrant and cosmetically appealing hue. The natural pigmentation conferred by betanin — the principal betacyanin in Beta vulgaris — offers a compelling advantage over synthetic colorants such as FD&C Red 33 or Red 40, which have been associated with hypersensitivity reactions and are subject to tightening regulatory scrutiny.[13] The observed color was stable at 25°C over 30 days, consistent with the known pH-stability of betalains at mildly acidic pH (4.0– 6.0).[7] Slight color attenuation at 40°C is consistent with the established thermolability of betalain pigments and underscores the importance of appropriate storage conditions.

3.2.2 Odor

Formulations containing orange essential oil at 1.0 mL (F13–F17) consistently demonstrated a more pronounced and lingering citrus fragrance compared to batches prepared with 0.5 mL. Batch F17 attained the highest hedonic score of 4.6/5.0. The dominant aromatic contributor is d-limonene (≥85% of oil composition), a monoterpene with well-documented pleasant organoleptic properties. The absence of off-odors across all batches throughout the study period confirms the antioxidant efficacy of vitamin E oil in preventing lipid peroxidation and volatile compound degradation within the formulation.[11]

3.2.3 Texture, Consistency, and Spreadability

Texture is a primary determinant of exfoliating efficacy and user experience. Lower sucrose concentrations (5.0 g in F1–F9) yielded formulations perceived as insufficiently exfoliating, while the highest sucrose concentration (7.0 g in F17), combined with the maximum beeswax level (3.0 g), produced the optimal balance of smooth application and mild, therapeutically effective grittiness. Batch F17 achieved a spreadability diameter of 3.8 cm under a 200 g load in 30 seconds, within the accepted range of 3.5–5.0 cm reported in literature for semi-solid lip cosmetics,[17] reflecting optimum wax-to-petrolatum ratio and confirming ease of controlled application.

3.2.4 pH

The pH of Batch F17 was 6.0 ± 0.05, well within the physiologically optimal range for the lip mucosa (5.5–7.0).[16] Formulations with pH values outside this range risk compromising epithelial integrity, disrupting the acid mantle, or promoting microbial proliferation. A mildly acidic pH additionally supports the chemical stability of betalain pigments, which undergo structural degradation under alkaline conditions. The consistent pH values recorded across 30 days at 25°C (pH 6.0) and at 40°C (pH 6.1) confirm the buffering stability of the formulation.

3.2.5 Washability and Skin Safety

Batch F17 was completely and uniformly removed from the test surface with room-temperature water without leaving discernible residue, staining, or discomfort. This favorable washability is a consequence of the amphiphilic nature of the wax-petrolatum matrix, which disperses upon mechanical agitation in the presence of water. In the standardized patch test, no volunteer exhibited any sign of erythema, edema, pruritus, or vesiculation at 24 or 48 hours post-removal, confirming the non-irritating and non-sensitizing profile of the optimized formulation. These results are consistent with the established safety records of all component ingredients and validate the formulation for topical lip application.

3.3 Stability Studies

Short-term stability evaluation of the optimized Batch F17 at 25°C and 40°C over 30 days yielded the results presented in Table 3. At ambient temperature (25°C), all evaluated parameters — color, odor, pH, texture, consistency, phase integrity, and spreadability — remained unchanged from baseline values at both the 15-day and 30-day evaluation points. At accelerated conditions (40°C), a marginal attenuation of color intensity and a slight reduction in odor intensity were noted at Day 30, attributable to the thermolabile nature of betalain pigments and increased volatilization of orange essential oil constituents, respectively. No phase separation, crystallization, or microbiological deterioration was observed in any stored sample under either condition. These findings are indicative of a satisfactory short-term stability profile and support the suitability of the formulation for ambient-temperature consumer use.

Table 3: Short-Term Stability Study Results — Optimized Formulation Batch F17.

Parameter	Day 0	25°C / Day 15	25°C / Day 30	40°C / Day 30	Inference
Color	Reddish-pink	Reddish-pink	Reddish-pink	Slight fading	Stable
Parameter	**Day 0**	**25°C / Day 15**	**25°C / Day 30**	**40°C / Day 30**	**Inference**
Odor	Pleasant citrus	Pleasant citrus	Pleasant citrus	Mild attenuation	Stable
pH	6.0	6.0	6.0	6.1	Stable
Texture	Smooth	Smooth	Smooth	Slightly softer	Stable
Consistency	Semi-solid	Semi-solid	Semi-solid	Semi-solid	Stable
Phase Separation	None	None	None	None	Stable
Spreadability	Good	Good	Good	Good	Stable

3.4 Comparative Evaluation and Selection of Optimized Batch

A comparative assessment of the three highest-performing batches — F14, F15, and F17 — is presented in Table 4. Batch F17 consistently outperformed F14 and F15 across all evaluated parameters, achieving an overall composite score of 9.5/10 compared to 8.0/10 for F15 and 7.0/10 for F14. The superior performance of F17 was attributable to its higher concentrations of beetroot powder (enhanced color and antioxidant activity), sucrose (improved exfoliation), petroleum jelly and beeswax (optimal consistency and structural integrity), and orange essential oil (superior organoleptic profile).

Table 4: Comparative Evaluation of Near-Optimal and Optimized Batches (F14, F15, F17).

Parameter	Batch F14	Batch F15	Batch F17 (Optimized)
Color	Pink	Dark reddish-pink	Reddish-pink
Odor	Mild citrus	Mild citrus	Pleasant citrus
pH	5.9	6.1	6.0
Texture	Slightly gritty	Smooth	Smooth, mild gritty
Consistency	Semi-solid	Semi-solid	Semi-solid
Spreadability	Moderate	Good	Good
Washability	Easy	Easy	Easy
Skin Irritation	None	None	None
Stability (30 days)	Stable	Stable	Stable
Overall Score	7/10	8/10	9.5/10

3.5 Synergistic Ingredient Interaction in Batch F17

The superior performance of Batch F17 reflects the synergistic functionality of its six constituent ingredients. Beetroot powder (Beta vulgaris) provides the primary cosmetic actives: betalain pigments for natural, safe coloration; polyphenols for free-radical scavenging protection (ORAC: 2.74 mmol Trolox eq/g betanin); and phenolic acids for potential melanogenesis inhibition via tyrosinase modulation.[7,8] Petroleum jelly functions as the occlusive emollient backbone, reducing TEWL by forming a hydrophobic barrier over the lip surface — reported to reduce TEWL by up to 98% under occlusive conditions.[9]

Beeswax (Cera Alba) imparts structural cohesion, prevents phase separation during storage, and contributes inherent antimicrobial activity via residual propolis constituents, supporting microbiological self-preservation.[10] Sucrose provides gentle mechanical exfoliation (Mohs hardness 1.5–2.0), suitable for sensitive lip mucosa, while simultaneously functioning as a hygroscopic humectant that supports post-application hydration; its complete biodegradability makes it an environmentally responsible alternative to synthetic microbeads.[6] Orange essential oil

(Citrus sinensis; d-limonene ≥85%) enhances sensory appeal and provides supplementary antimicrobial activity, while limonene may also function as a cutaneous penetration enhancer for co-incorporated actives.[12] Vitamin E oil (dl-α-tocopherol) stabilizes the lipid phase against oxidative rancidity during storage and delivers targeted antioxidant protection at the lip surface upon application, complementing the extrinsic antioxidant role of betalains.[11] The collective activity of these six components addresses the principal lip care concerns — exfoliation, moisturization, antioxidant protection, natural pigmentation, and microbiological stability — within a single, biodegradable formulation.

4. CONCLUSION

The present investigation successfully developed, optimized, and characterized a polyherbal lip scrub using a systematic formulation approach. Among the seventeen batches evaluated, Batch F17 — comprising beetroot powder (2.0 g), petroleum jelly (12.0 g), beeswax (3.0 g), sugar (7.0 g), orange essential oil (1.0 mL), and vitamin E oil (0.5 mL) — was identified as the optimized formulation based on comprehensive physicochemical, organoleptic, safety, and stability assessment. The fusion method employed is simple, reproducible, and amenable to scale-up. The formulation demonstrated desirable reddish-pink pigmentation, pleasant citrus aroma, smooth exfoliating texture, semi-solid consistency, physiologically compatible pH (6.0), satisfactory spreadability, easy washability, and a confirmed non-irritating and non-sensitizing safety profile in human volunteers. Short-term stability data at ambient temperature support its suitability for general consumer application.

The synergistic combination of natural, plant-derived, and pharmacopoeial-grade ingredients enables the formulation to simultaneously exfoliate, moisturize, protect, and naturally colour the lips without dependence on synthetic dyes, chemical preservatives, or petrochemical actives. The incorporation of sugar as a biodegradable exfoliant aligns the product with current regulatory and sustainability imperatives. These attributes collectively position the polyherbal lip scrub as a scientifically credible, safe, and commercially promising candidate for the natural lip care product segment. Extended stability, clinical efficacy, and scale-up studies are recommended to advance this prototype toward commercial development.

ACKNOWLEDGEMENTS

The authors express their sincere gratitude to Mr. Ajay S. Mule, M.Pharm, Department of Pharmaceutical Chemistry, Mrs. Saraswati Wani College of Pharmacy, Ganegaon, for his expert guidance, intellectual mentorship, and constant encouragement throughout this research. Appreciation is extended to Mr. Deshmukh D.B., Project Co-ordinator, for his valuable co-supervision and constructive feedback. The authors thank the faculty and technical staff of the Department of Pharmaceutics for their support during the practical work. Special thanks are due to all volunteers who participated in the patch test study and provided informed consent.

CONFLICT OF INTEREST

The authors declare no conflict of interest. The research was conducted as an academic exercise under institutional supervision and received no external funding.

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Cover Letter for Journal Submission

Date: 17 May 2026 To,

The Editor-in-Chief, [Journal Name] [Journal Address]

Subject: Submission of Original Research Article — Formulation and Evaluation of a Polyherbal Lip Scrub

Dear Editor,

We respectfully submit for your consideration our original research manuscript entitled "Formulation and Evaluation of a Polyherbal Lip Scrub: A Systematic Approach to Physicochemical Optimization and Safety Assessment" for publication in [Journal Name].

The manuscript reports the systematic development and comprehensive evaluation of a polyherbal lip scrub utilizing beetroot powder (Beta vulgaris) as the principal herbal active, in combination with petroleum jelly, beeswax, sucrose, orange essential oil, and vitamin E oil. Seventeen formulation batches were designed and evaluated for physicochemical, organoleptic, and safety parameters using validated methods. The optimized formulation (Batch F17) demonstrated excellent pH compatibility (6.0), satisfactory spreadability, stable pigmentation, and a confirmed non-irritating safety profile in human volunteer patch tests. Short-term stability studies at 25°C and 40°C over 30 days further validated the formulation's suitability for consumer use.

The findings of this work represent an original contribution to the scientific literature on herbal cosmetic formulation science. The polyherbal approach, the systematic batch optimization methodology, and the biodegradable, synthetic-preservative-free formulation profile are particularly relevant to the current scientific and regulatory discourse on natural cosmetics. The manuscript has not been previously published and is not under consideration elsewhere.

We believe this work is well-suited to the readership of [Journal Name] and would be of interest to researchers and practitioners working in cosmetic science, pharmaceutical technology, and herbal medicine. All authors have read and approved the manuscript.

We declare no conflicts of interest. The study was conducted in accordance with ethical principles, and all human volunteer participants provided written informed consent.

We are grateful for the time and consideration of the editorial team and look forward to your response.
Yours sincerely,

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Recommended Journals for Submission

The following peer-reviewed journals are recommended based on scope alignment, impact factor, open-access options, and Scopus/UGC indexing status:

1. **Journal of Cosmetic Science (Wiley)** | *ISSN: 1525-7886 (online)*
Scopus-indexed, Q2. Publishes original research in cosmetic formulation, dermatology, and personal care science. High relevance for physicochemical evaluation studies. Submission portal: onlinelibrary.wiley.com/journal/15257886
2. **Indian Journal of Pharmaceutical Sciences (IJPS)** | *ISSN: 0250-474X*
UGC-CARE List, Scopus-indexed, PubMed-indexed. Premier Indian pharmacy journal covering cosmetics, pharmaceutics, and herbal formulations. Free for Indian authors (no APC). Submission: ijpsonline.com
3. **Asian Journal of Pharmaceutics (AJP)** | *ISSN: 0973-8398*
UGC-CARE List, Scopus-indexed. Focuses on pharmaceutical and cosmetic formulation research from Asian contexts. Accepts short communication and full research papers. Submission: asianjournalofpharmaceutics.com
4. **International Journal of Pharmacy and Pharmaceutical Sciences (IJPPS)** | *ISSN: 0975-1491* Scopus-indexed, UGC-CARE approved. Specifically oriented toward pharmaceutical and cosmetic formulation studies; accepts B.Pharm/M.Pharm research. Submission: innovareacademics.in/journals/index.php/ijpps
5. **Journal of Pharmacy Research (JPR)** | *ISSN: 0974-6943*
UGC-CARE List, Scopus-indexed. Covers pharmaceutical technology, cosmetics, herbal formulations, and evaluation studies. Rapid review turnaround; suitable for B.Pharm/M.Pharm-level research. Submission: jpronline.info