WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
Coden USA: WJPRAP Impact Factor 8.63
Volume 15, Issue 21, 1752-1766. Review Article ISSN 2277–7105

GUNJADYA TAILA IN THE MANAGEMENT OF DARUNAKA (DANDRUFF): A REVIEW OF ITS PHYTOCHEMICAL CONSTITUENTS, POTENTIAL MECHANISMS OF ACTION AND THERAPEUTIC PROSPECTS

Dr. Rachana Kale[1*], Dr. Sheela Pargunde[2]

[1]Postgraduate Scholar, [2]Postgraduate Guide and Head of Department

Department of Rasashastra and Bhaishajya Kalpana, YMT Ayurvedic Medical College and Hospital, Navi Mumbai, Maharashtra, India.

Article Received on 05 Oct. 2026,
Article Revised on 25 Oct. 2026,
Article Published on 01 Nov. 2026

https://doi.org/10.5281/zenodo.23912484

***Corresponding Author**

Dr. Rachana Kale

Postgraduate Scholar, Department of Rasashastra and Bhaishajya Kalpana, YMT Ayurvedic Medical College and Hospital, Navi Mumbai, Maharashtra, India.

How to cite this Article: Dr. Rachana Kale[1]*, Dr. Sheela Pargunde[2]. (2026). Gunjadya Taila in the Management of Darunaka (Dandruff): A Review of its Phytochemical Constituents, Potential Mechanisms of action and Therapeutic Prospects. World Journal of Pharmaceutical Research, 15(21), 1752–1766.

This work is licensed under Creative Commons Attribution 4.0 International license.

ABSTRACT

Darunaka is described in Ayurveda as a scalp disorder characterized by features such as Kandu (itching), Keshachyuti (hair fall), Rukshata (dryness) and Twaksphutana (scaling). Gunjadya Taila, a traditional Ayurvedic oil-based formulation containing Gunja (Abrus precatorius), Bhringaraja (Eclipta alba) and Tila Taila (Sesamum indicum), is used in the traditional care of scalp and hair disorders. This review discusses the Ayurvedic rationale for Gunjadya Taila and the phytochemical properties of its ingredients in relation to scalp health. Published research describes flavonoids and phenolic compounds in Abrus precatorius, bioactive constituents such as wedelolactone and apigenin in Eclipta alba, and fatty acids and lignans in sesame oil. These constituents have been investigated for antioxidant, anti-inflammatory, antimicrobial or emollient properties, offering a rationale for the formulation's complementary role in scalp care. From an Ayurvedic perspective, the formulation's traditional use and the processing of its ingredients, including Gunja Shodhana and Sneha Paka, are important parts of its pharmaceutical preparation. This review brings together classical Ayurvedic understanding and contemporary phytochemical literature to discuss the therapeutic prospects of Gunjadya Taila in Darunaka.

KEYWORDS: Darunaka; Dandruff; Gunjadya Taila; Abrus precatorius; Eclipta alba; Sesamum indicum; Phytochemicals; Malassezia; Antifungal activity; Ayurvedic formulation.

1. INTRODUCTION

Dandruff is one of the most common scalp disorders, characterized by excessive shedding of dead corneocytes from the scalp, resulting in visible white or yellowish flakes, sometimes accompanied by itching and mild irritation. It is generally considered a mild, non-inflammatory form of the spectrum of seborrhoeic dermatitis, although the two conditions are often distinguished clinically by the presence and severity of inflammation. Dandruff is a chronic, relapsing condition that may affect an individual's comfort, self-confidence and quality of life.[1] The pathogenesis of dandruff is multifactorial and involves interactions between Malassezia yeasts, sebum, epidermal barrier function and individual susceptibility. Although Malassezia species are part of the normal scalp microbiota, changes in the scalp environment and host response may contribute to abnormal scaling and irritation. Therefore, dandruff is not simply a result of poor personal hygiene or fungal infection; it is a complex scalp condition influenced by biological and environmental factors.[2]

1.1 Prevalence

Dandruff is a highly prevalent scalp condition, affecting approximately 50% of the adult population worldwide at some point in life. It occurs across different geographical regions, ethnic groups and genders, although variations in prevalence have been reported between populations. The condition generally begins after puberty, is common in early adulthood, and may become less prevalent after 50 years of age. Dandruff has also been reported more frequently in males than in females. Its severity may fluctuate with seasonal and environmental changes, and symptoms are often aggravated during cold or dry weather. It is important to distinguish dandruff from seborrhoeic dermatitis. While dandruff is estimated to affect approximately half of the adult population, seborrhoeic dermatitis is a distinct clinical condition with a lower reported prevalence. The prevalence estimates for these conditions should not be considered interchangeable.

1.2 Clinical Features

Dandruff primarily affects the scalp and is characterized by excessive desquamation of the stratum corneum, leading to visible flakes on the scalp, hair and shoulders. The clinical presentation may vary from mild, dry scaling to more prominent, oily flakes.[3]

The common clinical features include:

- Scalp scaling: Fine, white or yellowish flakes that may be dry or greasy and are visible on the scalp and hair.
- Pruritus: Itching of varying intensity, which may increase with the severity of scaling.
- Mild irritation: Some individuals experience scalp discomfort, sensitivity or a sensation of irritation.
- Visible flakes on clothing: Shed scales may accumulate on the shoulders and clothing, causing cosmetic and social concerns.
- Variable scalp oiliness: The scalp may appear dry or oily, depending on sebum production and individual characteristics.

In uncomplicated dandruff, visible erythema and significant inflammation are generally absent or minimal. When prominent redness, greasy scales, inflammation or involvement of other seborrhoeic areas—such as the eyebrows, nasolabial folds, ears and upper chest—is present, seborrhoeic dermatitis should be considered. Persistent or severe scaling may also require differentiation from scalp psoriasis, atopic dermatitis and allergic or irritant contact dermatitis.[4] Dandruff is a chronic, relapsing condition. Although it is not generally considered harmful or contagious, recurrent itching and visible scaling may affect personal confidence, social interactions and quality of life.

1.3 Modern Treatment of Dandruff

Modern treatment of dandruff aims to reduce scaling, control Malassezia proliferation, relieve itching and irritation, and prevent recurrence. Medicated shampoos containing ketoconazole, ciclopirox or selenium sulfide are commonly used because of their antifungal activity. Salicylic acid may help loosen and remove accumulated scales, while gentle regular shampooing may be sufficient for mild cases. In selected cases, coal tar preparations may help reduce scaling, and a clinician may prescribe a short course of topical corticosteroids when marked inflammation or itching is present, particularly in seborrhoeic dermatitis. Maintenance use of medicated shampoo may help control recurrent symptoms. Persistent, severe or atypical scaling should be assessed clinically to exclude other scalp disorders. These established treatments provide a useful context for investigating complementary traditional formulations such as Gunjadya Taila.

Antifungal shampoos such as ketoconazole, ciclopirox and selenium sulfide are commonly used to control dandruff. Keratolytic agents, such as salicylic acid, may be used when thick scales are present. In recurrent cases, intermittent maintenance treatment with a medicated shampoo may help maintain symptom control. Mild dandruff may also improve with regular washing using a gentle shampoo. Although conventional treatments are effective for many individuals, dandruff may recur after treatment is discontinued. Some patients may also experience dryness, irritation or sensitivity to particular products. Persistent, severe or atypical symptoms warrant clinical assessment to confirm the diagnosis and exclude other scalp disorders. The high prevalence and recurrent nature of dandruff have encouraged interest in complementary approaches, including traditional herbal formulations. In this context, Gunjadya Taila is worth investigating for its phytochemical composition and potential effects on scalp scaling and inflammation. However, its efficacy and safety against dandruff-associated Malassezia species require direct experimental and clinical evaluation.

2. Ayurvedic Perspective and Phytochemical Basis of Gunjadya Taila in the Management of Darunaka: A Review

2.1 Ayurvedic Perspective: Darunaka, Its Clinical Features, Dosha Concept and Traditional Importance of Gunjadya Taila

In Ayurveda, Darunaka is described as a disorder of the scalp (Shiroroga) characterized by Kandu (itching), Keshachyuti (hair fall), Rukshata (dryness), Twaksphutana (scaling) and Keshabhoomi Rukshata (dryness of the scalp). The Ayurvedic understanding considers the involvement of Doshas, particularly Vata and Kapha: Vata is associated with dryness, roughness and scaling, whereas Kapha is associated with itching and accumulation of scalp debris. Gunjadya Taila is traditionally prepared using Gunja (Abrus precatorius), Bhringaraja (Eclipta alba) and Tila Taila (Sesamum indicum) through Sneha Paka with herbal Kalka and the prescribed liquid medium. In accordance with the described Ayurvedic Shodhana procedure, Gunja is processed in Godugdha for three Prahar; the seed coats are then removed and the material is shade-dried before use. In Ayurvedic pharmaceutical practice, correctly performed Shodhana is intended to transform the raw material into its Shuddha form for prescribed use. The procedure should be followed faithfully and documented as part of formulation preparation.[5]

2.2 Pathophysiology of Dandruff

Dandruff is a multifactorial scalp condition involving interactions among Malassezia yeasts, sebum, epidermal barrier integrity and the host inflammatory response. Malassezia species, including M. restricta, M. globosa and M. furfur, are associated with dandruff and seborrhoeic dermatitis. These lipid-dependent yeasts use surface lipids and produce enzymes that metabolize sebum; resulting metabolites may affect the epidermal barrier and contribute to scaling or irritation in susceptible individuals. Barrier disruption, altered corneocyte cohesion and local inflammatory responses can further influence dryness, itching and visible flakes. Thus, dandruff is best understood as an interaction between microbial activity, scalp lipids, barrier function and individual susceptibility.[8-10]

2.3 Phytochemistry of Gunja (Abrus precatorius)

Abrus precatorius L., commonly known as Gunja in Ayurveda, belongs to the family Fabaceae. Different parts of the plant have been described in traditional medicine. Phytochemical investigations have identified diverse chemical constituents, including flavonoids, phenolic compounds, alkaloids, terpenoids, steroids, organic acids and proteins.[11]

2.3.1 Flavonoids and Phenolic Compounds

Flavonoids and phenolic compounds are plant secondary metabolites investigated for antioxidant properties and possible effects on oxidative stress and inflammatory pathways. Their relevance to Gunjadya Taila may depend on the plant material used, the extraction of Swarasa and Kalka, and whether the prescribed rules of Sneha Kalpana are followed so that the intended preparation is properly formed. The final composition may also be influenced by concentration, processing conditions and stability; these aspects provide a useful scope for formulation-specific phytochemical study.

2.3.2 Alkaloids and Terpenoids

Alkaloids and terpenoid constituents have also been reported in phytochemical studies of A. precatorius. Some members of these broad chemical classes have shown biological activities in other plant systems. Their presence provides a rationale to investigate the antifungal potential of Gunja-containing preparations; this possibility requires practical evaluation through suitable in-vitro and, where justified, in-vivo studies, particularly against dandruff-associated Malassezia species.

2.3.3 Antimicrobial Research

Published reviews of A. precatorius describe antimicrobial and other pharmacological activities reported for selected plant extracts and constituents. These findings provide a basis for further research rather than direct proof of activity of Gunjadya Taila against dandruff-associated yeasts. The plant part, extraction method, test organism and concentration can influence reported results. In Ayurvedic pharmaceutics, Gunja is classified among the Upavisha and should therefore be used only after the prescribed Shodhana procedure has been correctly completed. The traditional method described for this formulation—processing in Godugdha for three Prahar, followed by removal of the seed coats and shade-drying—should be carefully followed and recorded. The formulation's properties may then be investigated through appropriate pharmaceutical and experimental studies.

2.4 Proposed Mechanisms of Gunja Phytochemicals

The potential effects of Gunja phytochemicals in scalp disorders may be explored through antimicrobial, antioxidant and inflammation-modulating mechanisms. These are proposed avenues for investigation based on properties reported for selected phytochemical groups, rather than established actions of Gunjadya Taila.

Flavonoids and phenolic compounds may contribute to antioxidant activity in experimental systems and may influence pathways associated with inflammation. These properties offer a scientific basis for further exploration of Gunja in topical formulations intended for scalp care. Selected extracts of A. precatorius have also been investigated for antimicrobial properties, creating scope to examine the complete Gunjadya Taila formulation against M. restricta, M. globosa and M. furfur under appropriate laboratory conditions. Phytochemical profiling of the finished oil may help characterize constituents associated with the formulation and relate them to the prescribed Sneha Paka process. Further experimental work is needed to establish the formulation's specific activity and to define appropriate quality parameters.

2.5 Phytochemistry of Bhringaraja (Eclipta alba)

Eclipta alba (L.) Hassk., commonly known as Bhringaraja, belongs to the family Asteraceae and is traditionally used in Ayurvedic formulations for hair and scalp care. Phytochemical investigations have identified several classes of compounds, including coumestans, flavonoids, triterpenoid saponins and other phenolic metabolites. Among the reported

constituents, wedelolactone, demethylwedelolactone, eclalbasaponins and apigenin have received attention in pharmacological research.[12]

2.5.1 Wedelolactone and Demethylwedelolactone

Wedelolactone is a coumestan-type phytochemical identified in E. alba. It has been investigated for several biological activities, including antioxidant and anti-inflammatory effects in experimental models. Demethylwedelolactone is a related constituent also reported in the plant. These compounds are of interest because oxidative stress and inflammatory responses may contribute to scalp irritation in dandruff. However, findings from experimental models cannot be directly translated into clinical efficacy against dandruff.[13]

2.5.2 Eclalbasaponins

Eclalbasaponins are triterpenoid saponins reported in E. alba. Saponins are structurally diverse plant metabolites with a range of biological properties. Their pharmacological effects depend on their chemical structure, concentration and experimental conditions. The presence of eclalbasaponins supports phytochemical characterization of Bhringaraja, but further investigation is needed to establish their specific role, if any, in the antifungal activity of Gunjadya Taila.

2.5.3 Flavonoids

Flavonoids, including apigenin, have been reported in E. alba. Flavonoids are studied for antioxidant, antimicrobial and inflammation-modulating properties in experimental systems. These activities may contribute to the biological interest in Bhringaraja for scalp health. Because aqueous Swarasa, alcoholic extracts and medicated oil can have different phytochemical profiles, studies of the properly prepared Sneha Kalpana may help clarify which constituents are incorporated and how they relate to the formulation’s properties.

2.6 Antifungal Activity of Bhringaraja

Experimental investigations have reported antifungal activity of E. alba extracts or isolated metabolites against selected fungal organisms. Boregowda and colleagues studied E. alba metabolites against agricultural fungal pathogens, including Fusarium thapsinum, Alternaria alternata, Epicoccum sorghinum and Curvularia lunata. The study reported antifungal effects of tested extracts or metabolites under laboratory conditions and identified compounds including wedelolactone, eclalbasaponin II and apigenin.

A later review of the dermatological potential of E. alba also discusses biological activities reported for its phytoconstituents, including selected antifungal findings. These studies provide a rationale for further testing of Bhringaraja against dermatologically relevant fungi, including Malassezia, using appropriate culture conditions and standardized preparations.[14] Experimental findings involving E. alba extracts or metabolites provide a useful starting point for investigating its potential against dandruff-associated Malassezia. Further in-vitro testing of the complete Gunjadya Taila prepared by the prescribed Sneha Paka method can assess the combined formulation, reflecting the Ayurvedic approach of processing medicinal ingredients into a functional oil preparation. Comparative studies may help describe the contribution of the ingredients and the finished formulation.

2.7 Phytochemistry of Tila Taila (Sesamum indicum)

Tila Taila, obtained from the seeds of Sesamum indicum L., is an important oil base in Ayurvedic pharmaceutical preparations. Sesame oil contains fatty acids, lignans, tocopherols, phytosterols and other minor constituents. The major fatty acids commonly reported include oleic acid and linoleic acid, along with palmitic and stearic acids. Sesamin, sesamolin and sesamol are among the characteristic sesame lignans investigated for their antioxidant properties.[15] Sesamin and sesamolin are naturally occurring lignans in sesame, while sesamol may occur naturally or be generated during processing under certain conditions. Tocopherols contribute to the antioxidant profile of sesame oil. The relative abundance of these constituents varies with cultivar, growing conditions, processing, storage and refining methods.[16]

Research on sesame oil and its constituents has described antioxidant and inflammation-modulating properties in experimental systems. These findings support interest in Tila Taila as a pharmaceutical vehicle and as a source of constituents relevant to scalp care. Whether sesame oil alone has a useful effect on dandruff, or whether any benefit is mainly associated with its vehicle and emollient properties, remains a question for further research.[17]

2.8 Role of Tila Taila in the Formulation

Tila Taila may serve several pharmaceutical and functional roles in Gunjadya Taila. As the oil base, it supports the incorporation and topical application of constituents transferred from herbal materials during Sneha Paka. Its oily nature may help lubricate the scalp and hair, soften scales and reduce the sensation of dryness. Sesame oil's fatty acids and minor antioxidant constituents may also contribute to the formulation's physicochemical

characteristics. In Ayurvedic Sneha Kalpana, medicinal ingredients are processed with the oil and prescribed liquid media so that their intended properties may be incorporated into the finished preparation. The extent and profile of constituents present after processing can be explored through suitable analytical methods, alongside assessment of the finished oil's quality and stability.

2.9 Proposed Combined Mechanism of Gunjadya Taila

The proposed combined action of Gunjadya Taila may be understood through the complementary roles of its three ingredients. Gunja contributes a distinctive phytochemical profile and has been investigated for selected biological activities; Bhringaraja contains coumestans, flavonoids and saponins studied for antioxidant, inflammation-modulating and selected antifungal properties; and Tila Taila serves as the oil base, supporting lubrication and topical application. The formulation may therefore offer complementary effects relevant to scalp dryness and irritation, while its possible activity against M. restricta, M. globosa and M. furfur can be explored experimentally.

It is hypothesized that the combination may provide complementary effects on scalp dryness, irritation and microbial growth. The oil base supports topical spread and lubrication, while constituents transferred from Gunja and Bhringaraja during Sneha Paka may contribute to the formulation's phytochemical profile. Comparative studies of individual ingredients and the complete formulation can help clarify these contributions and explore possible combined effects against M. restricta, M. globosa and M. furfur.

2.10 Pharmaceutical Standardization of Gunjadya Taila

Pharmaceutical standardization is essential to ensure the quality, consistency, safety and reproducibility of Gunjadya Taila. Variation in plant identity, geographical origin, harvesting, processing, proportions of ingredients and preparation conditions may alter the chemical composition of the finished product. Standardization should therefore address raw materials, the manufacturing process and the final formulation.

2.10.1 Sneha Paka

Sneha Paka is a central pharmaceutical process in which Sneha Dravya (oil or ghee) is processed with Kalka (herbal paste) and a prescribed liquid medium such as Swarasa or other indicated Drava Dravya. The ingredients are combined in the proportions specified by the relevant classical reference, and the mixture is heated with controlled, continuous stirring to

facilitate transfer of suitable constituents into the lipid medium while allowing the liquid phase to evaporate. The duration and intensity of heating, particle size and quantity of Kalka, nature and amount of liquid media, and final endpoint can influence the quality of the finished Sneha. Processing is continued until the classical Sneha Siddhi Lakshana are observed and the preparation reaches the intended stage, avoiding both inadequate processing and excessive heating. Commonly described indicators include appropriate reduction or absence of moisture, characteristic colour and odour, suitable consistency of the Kalka, and the absence of crackling associated with residual moisture when assessed according to the applicable classical procedure. These observations should be interpreted in line with the specific Sneha Paka method and authoritative text used. Recording ingredient identity, quantities, processing temperature and duration, stirring, endpoint observations and final yield supports reproducibility. Modern physicochemical and stability testing can complement these classical observations and help establish formulation-specific quality standards.[5]

2.10.2 Physicochemical Parameters

The finished formulation may be assessed using relevant physicochemical parameters, including:

- Organoleptic characteristics, such as colour, odour and consistency.
- Specific gravity and refractive index.
- Acid value, peroxide value and saponification value.
- Moisture content and viscosity.
- Microbial quality and appropriate contaminant testing.
- Stability under defined storage conditions.

These tests can help establish batch consistency, monitor oxidation and assess product quality. Acceptance criteria should be determined through validated methods and formulation-specific data rather than assumed in advance.

2.10.3 Phytochemical Profiling and Quality Assessment

Qualitative and quantitative phytochemical profiling can help identify characteristic constituents of Gunja, Bhringaraja and sesame oil. Analytical techniques such as high-performance thin-layer chromatography (HPTLC) and high-performance liquid chromatography (HPLC) may be used to develop suitable chemical fingerprints or quantify

selected marker compounds. Analytical validation should address specificity, precision, accuracy, linearity and sensitivity, where applicable.

Phytochemical profiling can be supported by modern analytical methods such as HPTLC or HPLC to document characteristic constituents and develop a reproducible fingerprint. Classical Ayurvedic procedures describe the processing and Shodhana of ingredients such as Gunja. When these traditional methods are studied alongside suitable modern analytical and quality-assessment approaches, they can be better characterized and may contribute to the development of reproducible standards for the finished formulation.

2.11 Antifungal Evaluation of Gunjadya Taila

The antifungal potential of Gunjadya Taila should be evaluated using standardized laboratory methods, with particular attention to the lipid requirements of Malassezia species. Since the antifungal activity of individual extracts may differ from that of the final oil, the complete formulation should be tested alongside appropriate controls.

2.11.1 Agar Diffusion Method

Agar cup diffusion is a simple preliminary screening method in which a defined well or cup is made in an inoculated agar medium and the test preparation is placed into it. After incubation under suitable conditions, the zone of growth inhibition around the cup is measured. The method can provide an initial indication of antifungal activity and permit comparison with appropriate positive and vehicle controls. For Malassezia, the medium and incubation conditions must support the organism’s lipid requirements; results should be interpreted alongside complementary methods because zone size is affected by diffusion as well as biological activity.

2.11.2 Minimum Inhibitory Concentration (MIC)

The minimum inhibitory concentration (MIC) is the lowest concentration of a test preparation that visibly inhibits the growth of a microorganism under defined laboratory conditions. MIC testing can help compare the inhibitory activity of different concentrations of the formulation or its extracts. Appropriate solvent, vehicle and positive controls are essential, and the culture conditions must support the growth of the selected Malassezia species.

2.11.3 Minimum Fungicidal Concentration (MFC)

The minimum fungicidal concentration (MFC) is the lowest concentration of a test preparation that produces fungicidal activity, determined by assessing the viability of organisms exposed to the test material. MFC assessment complements MIC results by helping distinguish growth inhibition from fungal killing. Studies should identify the Malassezia species tested, use suitable lipid-supplemented media and specify inoculum, incubation conditions, concentrations and interpretation criteria. The formulation should be compared with an established antifungal positive control. Further work may assess reproducibility, dose-response relationships and formulation stability. If laboratory antifungal activity is demonstrated consistently, it may provide a rationale for appropriately designed subsequent clinical research.

3. DISCUSSION

Darunaka is described in Ayurveda through features such as Kandu (itching), Rukshata (dryness), Twaksphutana (scaling) and Keshachyuti (hair fall). The traditional Vata–Kapha framework offers an Ayurvedic way to interpret these symptoms, with Vata associated with dryness and roughness and Kapha associated with itching and scalp debris. Gunjadya Taila is of interest as a traditional oil-based formulation prepared with Gunja, Bhringaraja and Tila Taila for scalp and hair care. Its traditional rationale provides a basis for a structured review of its ingredients and pharmaceutical process.

The formulation combines Gunja (Abrus precatorius), Bhringaraja (Eclipta alba) and Tila Taila (Sesamum indicum), whose potential roles are complementary. Gunja has a diverse phytochemical profile and selected extracts have been investigated for biological activities. Bhringaraja contains constituents such as wedelolactone, eclalbasaponins and flavonoids that have been studied in experimental settings. Tila Taila provides the oil base and emollient qualities that may support scalp lubrication. Published ingredient-level findings are useful for developing research hypotheses, but the specific activity of the complete Gunjadya Taila against dandruff-associated Malassezia—including M. furfur—needs formulation-specific evaluation.

The pharmaceutical process is central to the formulation’s identity. According to the described Ayurvedic procedure, Gunja Shodhana involves processing the material in Godugdha for three Prahar, followed by removal of the seed coats and shade-drying before use. Gunja is classified as an Upavisha in Ayurveda, so the prescribed Shodhana procedure

must be followed correctly. Sneha Paka then processes the herbal Kalka and indicated liquid media with the oil base. Careful documentation of raw materials, proportions, processing conditions and Sneha Siddhi Lakshana, together with appropriate physicochemical and phytochemical profiling, can support reproducibility and the development of formulation-specific standards.

Research on the individual ingredients describes antioxidant, inflammation-modulating and selected antimicrobial or antifungal activities in experimental settings. These findings provide a positive scientific rationale for further investigation of Gunjadya Taila, particularly because the formulation brings the ingredients together through a defined Ayurvedic pharmaceutical process. The formulation should be assessed as prepared, rather than assuming that ingredient-level findings automatically predict its overall activity. Laboratory evaluation against suitable Malassezia species, including M. furfur, can help clarify its antifungal potential.

Quality assurance is an integral part of responsible Ayurvedic pharmaceutical practice. Correct identification of Gunja, adherence to the prescribed Shodhana procedure, controlled Sneha Paka and suitable storage should be documented. Classical processing principles can be complemented by modern analytical methods, physicochemical testing and appropriate topical quality assessment. This combined approach may help characterize the preparation, establish reproducible standards and guide future experimental work.

Overall, Gunjadya Taila represents a traditional formulation with an Ayurvedic rationale and ingredients of phytochemical interest. Its intended topical use, oil-based nature and prescribed pharmaceutical processing provide a meaningful basis for continued study. Standardized preparation followed by in-vitro evaluation against dandruff-associated Malassezia may help establish whether the formulation has measurable antifungal activity and identify priorities for further research.

4. CONCLUSION

Gunjadya Taila is a traditional Ayurvedic oil-based formulation containing Gunja, Bhringaraja and Tila Taila, discussed in the context of Darunaka and scalp care. The Ayurvedic description of Darunaka emphasizes itching, dryness, roughness and scaling, while the Vata–Kapha framework provides a traditional rationale for topical care. Published literature describes phytochemicals in the ingredients with potential antioxidant,

inflammation-modulating and selected antimicrobial properties, and Tila Taila serves as an oil base that supports lubrication. Gunja Shodhana and Sneha Paka are important elements of the traditional pharmaceutical process; the prescribed Shodhana procedure should be followed correctly, and the preparation should be characterized through appropriate quality methods. The available ingredient-level literature provides a rationale for studying the complete formulation, but its antifungal activity against Malassezia species, including M. furfur, has not been established by this review. In-vitro testing using suitable culture conditions, controls and endpoints such as MIC and MFC may clarify its potential and guide subsequent research. Properly documented traditional processing, supported by modern analytical assessment, may also contribute to reproducible formulation standards.

REFERENCES

1. Shastri A, editor. *Sushruta Samhita* of Sushruta with Ayurvedatatva Sandipika Hindi commentary. Varanasi: Chaukhambha Sanskrit Sansthan; relevant *Nidana Sthana* reference for *Darunaka*.
2. Hay RJ. Malassezia, dandruff and seborrhoeic dermatitis: an overview. *Br. J. Dermatol.*, 2011; 165 Suppl 2: 2-8. doi:10.1111/j.1365-2133.2011.10570.x.
3. Gupta AK, Batra R, Bluhm R, Boekhout T, Dawson TL Jr. Skin diseases associated with *Malassezia* species. *J. Am Acad. Dermatol.*, 2004; 51(5): 785-798. doi:10.1016/j.jaad.2003.12.034.
4. Hiremath VR, Subramanya MV, Patil V. A clinical study on Gunjataila and Tilataila Shiroabhyanga in the management of Darunaka. *Ayushdhara*. 2016; 3(4): 792-796.
5. Sharma S, editor. Rasatarangini. 24th Taranga, verses 457–459. New Delhi: Motilal Banarsidass; edition and page details to be verified against the edition consulted.
6. Shastri K, Chaturvedi G, editors. Charaka Samhita. Varanasi: Chaukhambha Bharati Academy. Relevant sections on Shiroroga and Darunaka should be verified against the edition used.
7. The traditional uses, phytochemistry and pharmacology of Abrus precatorius L.: A comprehensive review. J. Ethnopharmacol., 2022; 296: 115463. doi:10.1016/j.jep.2022.115463.
8. Gupta AK, Batra R, Bluhm R, Boekhout T, Dawson TL Jr. Skin diseases associated with Malassezia species. J. Am Acad. Dermatol., 2004; 51(5): 785–798. doi:10.1016/j.jaad.2003.12.034.

9. Gupta AK, Bluhm R. Seborrheic dermatitis. J. Eur. Acad. Dermatol. Venereol., 2004; 18(1): 13–26. doi:10.1111/j.1468-3083.2004.00693.x.
10. Turner GA, Hoptroff M, Harding CR. Stratum corneum dysfunction in dandruff. Int. J. Cosmet. Sci., 2012; 34(4): 298–306. doi:10.1111/j.1468-2494.2012.00723.x.
11. Garaniya N, Bapodra A. Ethnobotanical and phytopharmacological potential of Abrus precatorius L.: A review. Asian Pac. J. Trop. Biomed. 2014; 4(1): S27–S34.
12. Unlocking therapeutic potential: Comprehensive extraction, profiling, and pharmacological evaluation of bioactive compounds from Eclipta alba (L.) Hassk. for dermatological applications. Plants (Basel). 2024; 13(1): 33. doi:10.3390/plants13010033.
13. Ethnopharmacological significance of Eclipta alba (L.) Hassk. (Asteraceae). 2016. Available from: PubMed Central, PMC4897414.
14. Boregowda RS, et al. Antifungal activity of Eclipta alba metabolites against sorghum pathogens. Plants (Basel). 2019; 8(3): 72. doi:10.3390/plants8030072.
15. Mili A, Das S, Nandakumar K, Lobo R. A comprehensive review on Sesamum indicum L.: Botanical, ethnopharmacological, phytochemical, and pharmacological aspects. J. Ethnopharmacol., 2021; 281: 114503. doi:10.1016/j.jep.2021.114503.
16. Bioactive lignans from sesame (Sesamum indicum L.): Evaluation of their antioxidant and antibacterial effects for food applications. 2015. Available from: PubMed Central, PMC4397349.
17. Afroz M, et al. Systematic review of antioxidant and anti-inflammatory activity of sesame oil and chemical profiling and docking study. Phytother. Res., 2019.