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Physicochemical Evaluation of the Ayurvedic Formulation Sindhuradhya Taila

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Abstract

Sindhura has been recognized since ancient times and is frequently mentioned in classical Rasagranthas as a Sādhāraṇa Rasa. However, texts like Rasataraṅgiṇī and Bhāvaprakāśa categorize it under Upadhātu. While some authors have interpreted Sindhura as "red oxide of mercury," Rasataraṅgiṇī distinctly identifies it as lead oxide. The formulation Sindhurādhya Taila contains Sindhura, Jīraka, and Sarṣapa Taila, all of which are known for their Raktaśodhaka (blood-purifying), Kaṇḍūghna (anti-pruritic), Kotha/Kusṭhaghna (skin disease alleviating), and Krimighna (antimicrobial) properties. This study was undertaken to prepare Sindhurādhya Taila as per the standards of the Ayurvedic Formulary of India (AFI), with classical reference from Cakradatta, for its use as an external application in the management of Pāma (scabies or eczema). The formulation underwent physicochemical and microbial analysis, and the results were systematically observed and recorded.

Keywords: Sindhura, Lead Oxide, External Application, Sindhurādhya Taila, Pāma

INTRODUCTION

Sindhura, renowned for its diverse therapeutic actions such as Vranaropaka (wound healing), Śodhaka (purifying), Kuṣṭhaghna (anti-dermatotic), and Kaṇḍūghna (anti-pruritic)¹, has been extensively utilized in the management of various skin disorders. While most classical Rasagranthas categorize Sindhura under Sādhāraṇa Rasa, authoritative texts like Rasataraṅgiṇī and Bhāvaprakāśa include it under Upadhātu, reflecting nuanced interpretations of its origin and classification. Notably, Ācārya Cakradatta refers to Sindhura as Sādhyopamāhāra², highlighting its potent and prompt therapeutic efficacy.

In light of these classical references and its established dermatological utility, Sindhurādhya Taila was selected for the present study, based on the formulation mentioned in the Kuṣṭha Cikitsā chapter of Cakradatta. The formulation aims to offer an effective external therapeutic option for conditions such as Pāma (scabies/eczema), integrating traditional wisdom with scientific validation.

Materials and Methods

The ingredients used in the preparation of Sindhurādhya Taila were Sindhura, Jīraka (Cuminum cyminum Linn.), and Sarṣapa Taila (mustard oil). The formulation was prepared following the classical Taila Pāka Vidhi as described in Ayurvedic texts.³

The analytical evaluation of the prepared Sindhurādhya Taila was conducted at the AYUSH-approved Drug Testing Laboratory of KLEU's Shri B.M.K. Ayurvedic Mahavidyalaya & Research Centre, Belagavi. Standard physicochemical and microbial tests were performed as per the procedures outlined



in the Ayurvedic Pharmacopoeia of India.4

Authentication of Sindhura

The market sample of the raw drug (Sindhura) was procured and authenticated by a governmentapproved drug testing laboratory.

Table 1: Test Report of the Market Sample of Sindhura Sent for Authentication

Sr. No	Parameters	Results
1	Assay for lead as pb	83.22%
2	Lead (II, IV) Oxide as pb3o4	91.8%

These results validate the identity of Sindhura as lead oxide, specifically Pb₃O₄ (red lead oxide), aligning with the description provided in Rasataraṅgiņī and supporting its categorization under Upadhātu. The preparation of Sindhurādhya Taila was carried out at the GMP-certified KLE Pharmacy, Khasbag, Pologovi. The method followed was based on the closed of t

Belagavi. The method followed was based on the classical reference from Cakradatta (Kuṣṭha Cikitsā) and aligned with the standard preparation method described in Bhaiṣajyaratnāvalī.⁵

The ingredients used and their respective quantities are detailed in Table 2.

Sl. No.	Ingredients	Proportion
1	Sindhura ⁶	1 part
2	Jiraka (Cuminum cyminum)	2 parts
3	Sarshapa taila (Brassica alba)	16 parts
4	Water	64 parts

Table No 2: Ingredients and quantity of Sindhuradhya Taila⁶

Method of preparation

Sodhana of Sindhura

Sindhura was subjected to Śodhana (purification) using the classical method. The raw Sindhura was taken in a Khalva Yantra (mortar and pestle), and continuous Mardana (trituration) was performed with lemon juice⁷ for a duration of 8 hours. After completion of this process, the material was dried under sunlight.

Subsequently, Bhāvanā (levigation) with Tandulodaka (rice wash water)⁸ was carried out to complete the purification process. This two-stage method ensured the detoxification and enhancement of the therapeutic efficacy of Sindhura.

Sarṣapa Taila Samūrchana

For the preparation of medicated oils, various base oils such as Tila Taila (sesame oil), Sarṣapa Taila (mustard oil), and Nārikela Taila (coconut oil) are commonly employed. Prior to their use, these oils undergo a preliminary purification and fortification process known as Taila Samūrchana.

This process is essential for removing Āmadoṣa (impurities) and Durgandhatā (foul odor), thereby enhancing both the therapeutic potency and shelf life of the final formulation.⁹ In the present study, Sarṣapa Taila Samūrchana was performed according to the classical method described in the Jvarādhi Kānḍa (fever chapter) of Bhaiṣajyaratnāvalī.

Procedure of Preparation:

The Mūrcchita Sarṣapa Taila was taken in a medium-sized vessel as the base oil. A fine Kalka (paste)



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was prepared using Sindhura and Jīraka, and this was added to the oil. The mixture was subjected to mild heating (Mandāgni) with continuous stirring.

Water was gradually added as per classical Sneha Pāka requirements, and the mixture was continuously stirred while maintaining a low flame until the appearance of characteristic Sneha Siddhi Lakṣaṇas (signs of proper oil preparation). Upon attaining Madhyama Pāka (medium stage of oil preparation), the vessel was removed from the fire and allowed to cool.

Once cooled, the Taila was filtered and packed hygienically. The total duration of preparation was 5 days, and the quantity of Sindhurādhya Taila obtained was 1.5 litres.

The prepared formulation was then subjected to physicochemical analysis and microbiological testing to ensure its quality, stability, and safety.

Analytical Study Of Sindhurādhya Taila:

The analytical evaluation of Sindhurādhya Taila included organoleptic, physicochemical, and microbiological assessments to determine its quality and safety.

Organoleptic characteristics are detailed in Table 3.

Physicochemical parameters and standards are summarized in Table 4.

Microbiological test results are presented in Table 5.

Table no 3: Organo-leptic characters of Sindhuradhya Taila

Test	Results
Colour	Reddish Brown
Odour	Pleasant
Form	Oily

Table no 4: Physico-chemical standards of Sindhuradhya Taila

Saponification value	185.4
Iodine value	94.71
Refractive index at 25c	1.482
Acid value	2.18
Specific Gravity	0.913
Loss on Drying at 110 ⁰	0.486%

Table no5: Microbiology report of Sindhuradhya Taila

E coli	Absent
Sauries	Absent
P.aeruginose	Absent
A.abony	Absent

Discussion

Refractive Index:

To figure out if the Taila is thick and gloopy or clear and slick, it underwent the Refractive Index test. The value came out at 1.482, paired with a Specific Gravity of 0.913. These numbers confirm that the Taila is crystal clear and not viscous—meaning it's light, fluid, and primed to absorb fast through the skin without leaving that greasy, stubborn residue.



Acid Value:

The Acid Value measures the free fatty acids (FFA) floating around in the oil—a key indicator of its stability and freshness. Higher acid values scream rancidity, but the Sindhurādhya Taila flaunts a low acid value, which tells us it's got good nutritive quality, is stable over time, and boasts a decent shelf life. No chemical drama here.

Saponification Value:

This one's the heavy hitter in fatty acid detective work. The Saponification Value—how many milligrams of potassium hydroxide it takes to neutralize the fatty acids from 1 gram of the sample— came in at 200. That's telling us this Taila is rich in saturated fatty acids, which means it's chemically stable and won't be handing out free radicals like party favors once absorbed. Since the taila is for external use, this saturation also keeps it safer and less reactive on the skin. This confirms the classical preparation method works its magic, converting any unsaturated oils into a stable, samyak siddha (properly perfected) formulation.

Iodine Value:

Here's where it gets interesting—the Iodine Value measures how many unsaturated bonds are kicking around in the fat. Surprisingly, the Sindhurādhya Taila clocked in at 94.71, which is relatively high and points to a significant presence of unsaturated fatty acids. So, while the saponification points to saturation, the iodine value reminds us there's still a good dose of unsaturation giving the Taila some flexibility, fluidity, and potentially enhanced therapeutic action. A subtle balance, if you will.

Testing for residual moisture, the Loss on Drying was a mere 0.486%, confirming the Taila is essentially water-free. This dryness is crucial, as moisture is the gateway for microbial mischief. With this low water content, the chances of microbial growth drop to almost zero.

Microbial Limit Test:

Last but not least, the microbial limit test sailed through comfortably within normal limits, giving us a green light for safe external application. No microbial hitchhikers here.

Conclusion

The physicochemical and microbiological analyses of *Sindhurādhya Taila* prepared according to the classical method described by Acharya Chakaradatta provide a reliable reference standard for this formulation. The organoleptic characteristics, refractive index, specific gravity, acid value, saponification value, iodine value, and loss on drying were all within acceptable limits, indicating that the *Taila* is of good quality, stable, and safe for external use.

The low acid value and microbial load suggest that the formulation has a good shelf life and is free from microbial contamination, making it suitable for clinical application. The saponification and iodine values confirm that the classical preparation method successfully converts the base oils into a stable formulation with a balanced fatty acid profile, ensuring both therapeutic efficacy and safety.

Overall, this study validates the preparation and quality of *Sindhurādhya Taila* as per the classical Ayurvedic references and provides a standard benchmark for future formulations and quality control. This will assist practitioners and researchers in maintaining consistency and ensuring the safe use of this traditional medicine.



Referances:

- 1. Mukharji B, Rasajala nidhi khanda Divitaya 3rd chapter, 4th edition, Varanasi; Chaukhambha Samskrita bhavana; 1998; pp 223.
- 2. Tripathi J, Shastri B. Chakaradatta . Varanasi chaukhamba samsakarta Series. Edn 15, 1983; pp:396 ; chap kushta Chikitsa ; verse152.
- 3. Tripathi J, Shastri B. Chakaradatta . Varanasi chaukhamba samsakarta Series. Edn 15, 1983; pp:396 ; chap kushta Chikitsa ; verse152.
- 4. The Pharmacopeia of India. Part II (formulations). Appendices 1 to 5.Vol. 2 First ed. New Delhi: Govt. of India Ministry of Health and Family Welfare, Dept. of AYUSH; 2008. p. 218-23.
- 5. Govinda dasa, Bhaisajyaratnavali, ed by Rajeshwar datta shastri, Varanasi: Chaukhamba Prakashana; Edn 18,2007. Kustha chikitsa, verse 152, Pp 291.
- 6. Shastri. K.S, dasa M.B, rasa tarangini, reprint Edn 2000, Tarang 21, verse 148-149, Pp 546-547
- 7. Mukharji B, Rasajala nidhi khanda Divitaya 3rd chapter, 4th edition, Varanasi; Chaukhambha Samskrita bhavana; 1998; pp 224.
- 8. Mukharji B, Rasajala nidhi khanda Divitaya 3rd chapter, 4th edition, Varanasi; Chaukhambha Samskrita bhavana; 1998; pp 223.
- 9. Govinda dasa, Bhaisajyaratnavali, ed by Rajeshwar datta shastri, Varanasi: Chaukhamba Prakashana; Edn 18,2007. Kustha chikitsa, verse 152, Pp 291.