Available online through
www.jbsoweb.com
ISSN 2321 - 6328

Research Article

PRELIMINARY PHARMACEUTICAL AND ANALYTICAL CHARACTERIZATION OF KANAKA TAILA IN PIGMENTATION DISORDERS

Prajwal Sanakyanavar [1]*, Archana Pagad [2], Spoorthi MM [3]
[1] PG Scholar, Department of Rasashastra and Bhaishajya Kalpana, Sri Dharmasthala Manjunatheshwara College of Ayurveda and Hospital, Hassan, Karnataka, India
[2] Assistant Professor, Department of Rasashastra and Bhaishajya Kalpana, Sri Dharmasthala Manjunatheshwara College of Ayurveda and Hospital, Hassan, Karnataka, India
[3] PG Scholar, Department of Roga Nidana and Vikrithi Vijnana, Sri Dharmasthala Manjunatheshwara College of Ayurveda and Hospital, Hassan, Karnataka, India
*Corresponding Author Email: prajwalsanakyanavar@gmail.com

Article Received on: 09/05/26 Accepted on: 08/08/26

DOI: 10.7897/2321-6328.143416

ABSTRACT

Background: Kanaka Taila is a classical Ayurvedic formulation traditionally indicated for nilika (pigmentation disorders) and vyanga (melasma). It is described in Bhaishajya Ratnavali under Kshudra Roga Chikitsa, where it is primarily recommended for cosmetic and skin health care. This oil is intended for external applications on the skin. Materials and Methods: Kanaka Taila is prepared according to the principles of Sneha Kalpana (Ayurvedic pharmaceutics). Preliminary evaluation of the formulation includes organoleptic, and physicochemical parameters. Results: Kanaka Taila was successfully prepared, and its physicochemical parameters were found to be within normal ranges. The formulation showed a pH of 6.96, indicating nearly neutral suitable for topical use. The specific gravity was 0.9475, confirming uniform blending of ingredients. Viscosity measured at 44.9cP suggests smooth spreadability and ease of absorption, while the refractive index of 1.474 brix reflects clarity and purity of the oil. These values together highlight the therapeutic suitability of the preparation intended for skin care and cosmetic use. Conclusion: Kanaka Taila demonstrated stable physicochemical properties within normal ranges, indicating purity, and good absorption potential. These results validate its preparation method and support its application in skin care.

Keywords: Kanaka Taila, Melasma, Hyperpigmentation, Vyanga, Nilika.

INTRODUCTION

Kanaka Taila is a classical Ayurvedic formulation mentioned in Bhaishajya Ratnavali under Kshudra Roga Chikitsa, where it is indicated in nilika (pigmentation disorders) and vyanga (melasma). This oil is intended for external application and is valued for its cosmetic as well as therapeutic benefits in maintaining skin health. The preparation of Kanaka Taila follows the principles of Bhaishajya Kalpana, which involves careful pharmaceutical processes to ensure that the active properties of the herbs are transferred into the oil medium. The formulation typically includes ingredients such as Murchita Tila Taila as the base oil, Yastimadhu for skin-soothing properties, and other herbs like Priyangu, Manjishta, Utpala, Chandana, and Nagakesara, each contributing specific actions such as cooling, complexion-enhancing, and anti-inflammatory effects. In the present study, Kanaka Taila was prepared according to classical guidelines, and preliminary pharmaceutical and analytical evaluation was conducted. This included organoleptic assessment and physicochemical analysis to determine quality, purity, and stability. Such evaluation is essential for standardization and validation of Ayurvedic formulations, ensuring their safety and efficacy. Thus, Kanaka Taila represents a valuable example of traditional Ayurvedic wisdom being examined through modern pharmaceutical and analytical methods, highlighting its relevance in contemporary dermatological practice.

Aims and objectives

1. To prepare of Kanaka Taila
2. To conduct preliminary analytical study of Taila

MATERIALS AND METHODS

Collection of Raw Drugs

Raw materials for preparation of Kanaka Taila were procured from the market. Raw materials were authenticated by the Department of Rasashastra and Bhaishajya Kalpana and the Department of Dravyaguna according to Quality Standards of Indian Medicinal Plants, Indian Council of Medical Research (ICMR), New Delhi.

Pharmaceutical Study

Steps involved in preparation of Kanaka Taila

- Murchana of Tila taila
- Preparation of Kanaka taila

Murchana and Preparation of Kanaka Taila were done in the practical laboratory, department of Rasashastra and Bhaishajya Kalpana.

Table 1: Raw drugs required for Murchana of Tila taila[1]

Materials	Botanical name	Quantity taken
Tila taila	*Sesamum indicum* Linn. [2]	125mL
Manjista	*Rubia cordifolia* Linn.[3]	7.8g
Haridra	*Curcuma longa* Linn. [4]	1.95g
Lodhra	*Symplocos racemosa* Roxb. [5]	1.95g
Musta	*Cyperus rotundus* Linn. [6]	1.95g
Nalika	*Mesua ferrea* Linn. [7]	1.95g
Triphala	*Terminalia chebula* Retz. (Haritaki) [8] *Terminalia bellirica* Roxb. (Bibhitaki) [9] *Emblica officinalis* Gaertn. (Amalaki) [10]	1.95g each
Suchi Pushpa mula rasa	*Clitoria ternatea* Linn. [11]	1.95g
Jala	Dihydrogen monoxide (H_2O)[12]	250mL

Note- References 2-12 are listed in main references list and mL= milliliter, g= grams

Method of preparation of Taila Murchana[1]

Materials required: clean stainless steel, kora cloth, ingredients as mentioned above, stirrer, measuring jar and airtight bottle.

Procedure: Tila taila was taken in a clean stainless-steel vessel. The vessel is placed over mild fire and heated until foam starts to appear. Soon the fire was lit off and waited for nisphena bhava and saityabhava of the oil. The taila was then placed again over mild fire, and water was added to it. Meanwhile, the fine powders of Manjista and others were mixed with little quantity of water to prepare Kalka. This Kalka was then added to the vessel and boiling continued with frequent stirring. Boiling continued until Sneha Siddhi Lakshana attained.

Preparation of Kanaka Taila [13]

Table 2: Raw drugs required for kanaka taila and their quantity

Materials	Botanical name / Chemical name	Quantity taken
Murchita tila taila	*Sesamum indicum* Linn.	100mL
Yastimadhu Kashaya	*Glycyrrhiza glabra* Linn.	400mL
Priyangu	*Callicarpa macrophylla* Vahl.	5g
Manjishta	*Rubia cordifolia* Linn.	5g
Utpala	*Nymphaea alba* Linn.	5g
Chandana	*Pterocarpus santalinus* Linn.	5g
Nagakesara	*Mesua ferrea* Linn.	5g

Note- mL= milliliter, g= grams

Table 3: Quantity required for Yastimadhu Kashaya

Drugs	Quantity
Yastimadhu	200g
Water	1600mL

Note: mL= milliliter, g= grams

Method of Preparation of Kanaka Taila [13]

Materials required: clean stainless steel, kora cloth, ingredients as mentioned above, stirrer, measuring jar and airtight bottle.

Procedure: Required quantity of yastimadhu was taken and Kashaya was prepared. Murchita Tila Taila was taken in a clean stainless-steel vessel and placed over mild heat until the appearance of foam indicated proper heating. The vessel was then maintained on mild fire, and then Kashaya was added. Meanwhile, fine powders of priyangu, manjishta, utpala and nagakesara were triturated with a small amount of water to prepare kalka. This kalka was subsequently added to the vessel, and boiling continued with frequent stirring. The process was carried out until the attainment of Sneha Siddhi Lakshana, confirming completion of the preparation.

Table 4: Guna Karma of Ingredients used for Kanaka Taila in database of CCRAS [14-19]

Dravya	Rasa	Guna	Virya	Vipaka	Karma	Rogagnatha
Yastimadhu	Madhura	Guru, Snigdha	Sita	Madhura	Vatapittahara, Balya, Vrshya, Chakshusya	Kasa, Swarabheda, Kshaya, Vrana, Vatarakta.
Priyangu	Tikta, Kashaya, Madhura	Laghu, Ruksha	Sita	Katu	Tridoshahara	Daha, Jwara, Gulma, Visha, Moha.
Manjista	Tikta, Kashaya, Madhura	Guru, Ruksha	Ushna	Katu	kaphapittahara	Kandu, Kusta, Rakta pitta, Vyanga, Pidaka
Utpala	Kashaya, Madhura, Tikta	Laghu, Picchila, Snigdha	Sita	Madhura	Pittakaphahara	Rakta dosha, Daha, Shrama, Rakta pitta, Atisara.
Chandana	Madhura, Tikta	Guru, Ruksha	Sita	Katu	Kaphapittahara,Vrshya, Chakshusya	Visha, Shosha, Trishna, Daha, Chardi, Kasa
Nagakesara	Kashaya, Tikta	Ruksha, Tiksha, Laghu	Ushna	Katu	Kaphapittahara, Stambhaka	Visarpa, Kusta, Jwara, Kandu, Sopha.

Tila taila [2]	Madhura	Sukshma, Guru, Sara, Deepana, Lekhana.	Ushna	Madhura	Brihmana, Vrushya, Balya, Varnya.	Prameha, Kusta, Vajikarana.

Physicochemical Study

pH: [20]

The pH value measures acidic or alkaline of the solution. It is calculated using the formula pH = -log [H_3O^+], which means it depends on the concentration of hydrogen ions in the solution. Digital pH meter was used and was calibrated using 4 and 9 buffer capsules. Then sample pH was determined. The pH scale ranges from 0 to 14. This scale helps to easily determine the chemical nature of a solution.

Specific Gravity: [21]

The specific gravity measurement is based on comparing the density of a liquid to that of water at a standard temperature. This helps determine the relative heaviness of the liquid without requiring absolute density values.

Procedure: The pycnometer method determines the specific gravity of a liquid by comparing its weight to that of an equal volume of water in the room temperature around 25 ± 1^0C. First, the empty pycnometer is weighed, then filled with the liquid sample and weighed again. After cleaning and completely drying, it is refilled with distilled water at the same temperature and weighed again. This procedure is repeated 3 times, and an average was taken and calculated by dividing the weight of the liquid by the weight of an equal volume of water.

Viscosity: [22]

Viscosity is based on fluid resistance to flow due to internal friction of the liquid. This property determines how easily a liquid moves when subjected to force. Higher viscosity means greater resistance, while lower viscosity allows for smoother flow.

Procedure: The capillary tube method using a Viscometer measures viscosity by observing how a liquid flows through a narrow tube. The liquid is placed in a container and allowed to pass through the tube, while the time taken for it to flow is recorded. Viscosity is calculated using specific gravity of water and viscosity of water to that of specific liquid at 25 ± 1^0C.

Refractive Index: [23]

The refractive index helps to determine the angle of refraction in the given sample of the drug. Procedure: At refractometer (Abbe DR-A1, Atago, Japan) the calibration is done using Distil water method at 28^0C. Placed a drop of water on the prism and adjusted the drive knob in such a way that the boundary line intersects the separatrix exactly at the center. Noted the reading. Distilled water has a refractive index of 1.33217 at 28 C. The difference between the reading and 1.3320 gives the error of the instrument. If the reading is less than 1.3325, the error is minus (negative), then the correction is plus (positive). If the reading is more, the error is plus (positive), and the correction is minus (negative). The correction should be applied to the measured reading to get the accurate refractive index. The Refractive index of the test samples was measured at 25 ± 1^0C.

OBSERVATION AND RESULTS

Taila Murchana

125ml of Tila taila was taken in a clean stainless-steel vessel. The vessel was placed over mild fire and heated until foam started to appear. Soon the fire lit off and waited for nisphena bhava and saityabhava of the oil. The taila was then placed again over mild fire, and 250ml of water was added to it. Meanwhile, the fine powders of Manjista 7.8g and other ingredients with 1.95g each were mixed with little quantity of water to prepare Kalka. This kalka was then added to the vessel, and boiling continued with frequent stirring. Boiling continued until Sneha Siddhi Lakshana attained. After attaining siddhi lakshana the oil was filtered using kora cloth and it was a light reddish orange color.

Kanaka Taila

The preparation was carried out by first taking 200 g of Yastimadhu and boiling it with 1600 ml of water to obtain 400 ml of Kashaya. Then, 100 ml of Murchita Tila Taila heated mildly at around 60-70^{o}C in a clean stainless-steel vessel and heated mildly until foam appeared, indicating proper heating. The prepared Yastimadhu Kashaya was added to the vessel, and simultaneously fine powders of 5 g each of Priyangu, Manjishta, Utpala, Chandana, and Nagakesara were triturated with a small amount of Kashaya to prepare Kalka, which was subsequently added to the vessel. The mixture was boiled over mild fire with frequent stirring until Sneha Siddhi Lakshana was attained, confirming completion of the preparation.

Table 5: Results of pharmaceutical study

Yoga	Initial quantity	Final yield
Murchita Tila Taila	125mL	100mL
Kanaka Taila	100mL	85mL

Note: mL= milliliter

Table 6: Organoleptic characteristics of Kanaka Taila

Parameters	Taila
Colour	Light golden yellow (kanaka varna)
Odor	Characteristic pleasant odor
Taste	Pungent
Touch	Smooth
Appearance	Liquid

Table 7: Physicochemical analysis of Kanaka Taila

Parameters	Values
pH	6.96 (anhydrous formulation)
Specific Gravity	0.9475
Viscosity	44.9cP
Refractive Index	1.474 brix

DISCUSSION

In the preparation of Kanaka Taila, Yastimadhu Kashaya was used as the aqueous medium, and fine powders of Priyangu, Manjishta, Utpala, Chandana, and Nagakesara were incorporated as Kalka. The mixture was boiled until Sneha Siddhi Lakshana was attained. The yield reduction from 100 mL to 85 mL is consistent with evaporation and absorption during the process, which is typical in Sneha Kalpana. The final product showed organoleptic features such as light golden yellow color, pleasant odor, pungent taste, and smooth texture, aligning with classical descriptions.

The physicochemical analysis of Kanaka Taila such as pH (6.96), specific gravity (0.9475), viscosity (44.9 cP), and refractive index (1.474 brix) indicate that the oil maintains suitable characteristics for topical application. These values confirm ease of absorption, which are important for formulations intended for skin care and cosmetic use.

Fig 1. Ingredients of Taila Murchana

Fig 2. Kalka for Taila Murchana

Fig 3. Tila Taila & kalka

Fig 4. Murchita Tila Taila

Fig 5. Raw ingredients for Kalka

Fig 6. Yastimadhu Kashaya

Fig 7. Kashaya into fine powders

Fig 8. Prepared Kalka

Fig 9. Addition of Kashaya and kalka into taila

Fig 10. Start of Boiling

Fig 11. Prepared Kanaka Taila

In addition to these pharmaceutical observations, the guna–karma of the ingredients directly supports the classical indication of Kanaka Taila in Nilika (pigmentation disorders) and Vyanga (melasma). Manjista and Utpala are well known for Rakta shodhana and pitta hara properties, while Chandana and Priyangu provide sheeta virya and Pitta-shamaka actions, reducing burning sensations and discoloration. Yastimadhu nourishes the skin and enhances complexion; Nagakesara has pittahara action, and Tila Taila itself is Varnya, supporting complexion improvement. Together, these attributes validate the formulation's external application for pigmentation disorders as described in Bhaishajya Ratnavali.

Modern pharmacological studies further strengthen this classical understanding. Liquorice extract shows strong antioxidant activity, prevents oxidative stress, and maintains skin homeostasis, making it valuable in cosmetic formulations[24]. Tila taila contains lignans such as sesamin and sesamolin, which provide antioxidant effects and protect against UV radiation[25]. Priyangu is useful for excessive sweating and body odor[26]. Manjista contains anthraquinones and antioxidants, with extracts

showing tyrosinase inhibition and skin-lightening potential[27]. Rakta Chandana has been traditionally used for complexion enhancement, and modern studies confirm its role in reducing melanin production[28]. Utpala flowers contain flavonoids, gallic acid, and Vitamin E, offering antioxidant, anti-inflammatory, and UV-protective effects, with gallic acid specifically inhibiting melanin production[29].

Thus, reviewing earlier research on the individual drugs in the formulation shows their direct impact on pigmentation-related conditions such as hyperpigmentation and melasma. The preliminary pharmaceutical and analytical analysis of Kanaka Taila further supports its potential application in classical conditions like Nilika and Vyanga.

CONCLUSION

The study confirms that Kanaka Taila, prepared through classical Sneha Kalpana methods, yields a stable formulation with suitable organoleptic and physicochemical properties. Its ingredients—Manjista, Utpala, Chandana, Priyangu, Yastimadhu, Nagakesara, and Tila Taila—possess Rakta shodhaka, Pitta-shamaka, and Varnya actions, directly relevant to pigmentation disorders like Nilika and Vyanga. Modern evidence of antioxidant, UV-protective, and melanin-inhibiting activities further support its traditional use, thus hypothesized Kanaka Taila as a topical formulation for hyperpigmentation and melasma. While physicochemical data provide a foundation for quality control, bioactivity studies and clinical trials are essential to substantiate the claimed benefits of Kanaka Taila.

Limitation of the study

- Only a single observation for physicochemical analysis; no repeated trials.
- The study was limited to pharmaceutical preparation and preliminary analysis.

Future scope of study

Further analytical profiling, stability test, and clinical validation can be done.

REFERENCES

1. Govindadassen K. Bhaishajya Ratnavali. Mishra S, editor. Siddiprada Hindi commentary. Varanasi: Chaukhamba Surbharati Prakashan; 2015. Chapter 5, verse 1268. P. 206.
2. Jawanjal PT. Tila Taila: A review. World J Pharm Med Res. 2018;4(10):76-8. Available from: https://www.researchgate.net/publication/336853488_TILA_TAILA_A_REVIEW
3. Kumari I, Kaurav H, Choudhary G. Rubia cordifolia (Manjishtha): A review based upon its Ayurvedic and medicinal uses. Himalayan J Health Sci. 2021;6(2):1728. doi:10.22270/hjhs.v6i2.96
4. Anonymous. The Ayurvedic Pharmacopoeia of India. 1st ed. Vol 1, Part 1. Delhi: The Controller of Publications, Civil Lines; 2008. p.45.
5. Anonymous. The Ayurvedic Pharmacopoeia of India. 1st ed. Vol 1, Part 1. Delhi: The Controller of Publications, Civil Lines; 2008. p.82.
6. Patra S. A review of medicinal properties on Cyperus rotundus Linn. Ayushdhara. 2019;6(3):2235-41.
7. Sharma A, Sharma S, Rohit N, Parashar B. Mesua ferrea Linn: A review of the Indian medical herb. Syst Rev Pharm. 2017;8(1):19-23.
8. Anonymous. The Ayurvedic Pharmacopoeia of India. 1st ed. Vol 1, Part 1. Delhi: The Controller of Publications, Civil Lines; 2008. p.47.
9. Anonymous. The Ayurvedic Pharmacopoeia of India. 1st ed. Vol 1, Part 1. Delhi: The Controller of Publications, Civil Lines; 2008. p.25.
10. Anonymous. The Ayurvedic Pharmacopoeia of India. 1st ed. Vol 1, Part 1. Delhi: The Controller of Publications, Civil Lines; 2008. p.5.
11. Nangare N, Menon S, Vidya P, Pawar K, Kurulkar M. A critical review on Aparajita with special reference to Ayurveda classical texts. Int J Res Anal Rev. 2019 Jun;6(2):187. Available from: https://www.ijrar.org/IJRAR19K9289.pdf
12. Hegde PL, Harini A. Textbook of Dravyaguna Vijnana. Vol 3. Varanasi: Chaukhambha Publications; p.724-5.
13. Shastri A. Bhaishajya Ratnavali. Part 3, Chapter 60: Kshudra Roga Chikitsa, Shloka 113–114. Varanasi: Chaukhamba Sanskrit Bhawan; 2006. p.187.
14. Sharma PC, Yelne MB, Dennis TJ. Database on medicinal plants used in Ayurveda. Vol 3. CCRAS, New Delhi; 2005. p.561-6.
15. Sharma PC, Yelne MB, Dennis TJ. Database on medicinal plants used in Ayurveda. Vol 5. CCRAS, New Delhi; 2008. p.417-20.
16. Billore KV, Yelne MB, Dennis TJ, Chaudhary BG. Database on medicinal plants used in Ayurveda. Vol 7. CCRAS, New Delhi; 2005. p.353-6.
17. Sharma PC, Yelne MB, Dennis TJ. Database on medicinal plants used in Ayurveda. Vol 5. CCRAS, New Delhi; 2008. p.171-6.
18. Billore KV, Yelne MB, Dennis TJ, Chaudhary BG. Database on medicinal plants used in Ayurveda. Vol 7. CCRAS, New Delhi; 2005. p.361-6.
19. Sharma PC, Yelne MB, Dennis TJ. Database on medicinal plants used in Ayurveda. Vol 1. CCRAS, New Delhi; 2005. p.200-6.
20. Ministry of Health and Family Welfare, Government of India. The Ayurvedic Pharmacopoeia of India. Part 2, Vol 1. 1st ed. Delhi: The Controller of Publications, Civil Lines; 2009. p.13.
21. Ministry of Health and Family Welfare, Government of India. The Ayurvedic Pharmacopoeia of India. Part 2, Vol 1. 1st ed. Delhi: The Controller of Publications, Civil Lines; 2009.
22. Gaud RS, Gupta GD. Practical Physical Pharmacy. New Delhi: CBS Publishers; 2006. p.55-6.
23. Ministry of Health and Family Welfare, Government of India. The Ayurvedic Pharmacopoeia of India. Part 2, Vol 1. 1st ed. Delhi: The Controller of Publications, Civil Lines; 2009.
24. Castangia I, Caddeo C, Manca ML, Casu L, Latorre AC, Díez-Sales O, et al. Delivery of liquorice extract by liposomes and hyalurosomes to protect the skin against oxidative stress injuries. Carbohydr Polym. 2015;134:657-63.
25. Miyake Y, Fukumoto S, Okada M, Sakaida K, Nakamura Y, Osawa T. Antioxidative catechol lignans converted from sesamin and sesaminol triglucoside by culturing with Aspergillus. J Agric Food Chem. 2005;53(1):22-7.
26. Paprikar M, Paprikar M. Systematic review of Priyangu (Callicarpa macrophylla). J Ayurveda Integr Med Sci. 2021;6(5):227-33.
27. Vaibhav S, Lakshaman K. Tyrosinase enzyme inhibitory activity of selected Indian herbs. Int J Res Pharm Biomed Sci. 2012;3:977-82.
28. Hridya H, Amrita A, Mohan S, Gopalakrishnan M, Dakshinamurthy TK, Doss GP, et al. Functionality study of santalin as tyrosinase inhibitor: A potential depigmentation agent. Int J Biol Macromol. 2016;86:383-9.
29. Rana A. Overview of skin lightening formulations in Ayurveda w.s.r to Kanaka Taila. Int J Ayurvedic Herb Med. 2022 Mar-Apr;12(2):4194-203.

Cite this article as:

Prajwal Sanakyanavar, Archana Pagad and Spoorthi MM. Preliminary pharmaceutical and analytical characterization of Kanaka taila in pigmentation disorders. J Biol Sci Opin 2026;14(3):23-28.
http://dx.doi.org/10.7897/2321-6328.143416

Source of support: Nil; Conflict of interest: None Declared