WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
Coden USA: WJPRAP Impact Factor 8.63
Volume 15, Issue 17, 1883-1890. Research Article ISSN 2277–7105

COMPARATIVE PHARMACEUTICO-ANALYTICAL AND INVITRO ANTIMICROBIAL ACTIVITY OF MURCCHITA AND AMURCCHITA MANJISHTHADI TAILA IN PROPIONIBACTERIUM ACNES.

***[1]Dr. Sayali Mahendra Shinde, [2]Dr. Renuka Suryawanshi, [3]Dr. Santosh Pawale**

[1]Third Year Postgraduate Scholar, Department of Rasashastra and Bhaishajya Kalpana.

[2]Guide and Head of Department of Rasashastra and Bhaishajya Kalpana Pravara Medical Trust's Ayurved College, Shevgaon, Maharashtra, India.

[3]Principal, Department of Rasashastra and Bhaishajya Kalpana Pravara Medical Trust's Ayurved College, Shevgaon, Maharashtra, India.

Article Received on 10 August 2026,
Article Revised on 30 August 2026,
Article Published on 03 Sept. 2026,

https://doi.org/10.5281/zenodo.22267234

***Corresponding Author**
Dr. Sayali Mahendra Shinde
Third Year Postgraduate Scholar, Department of Rasashastra and Bhaishajya Kalpana.

How to cite this Article: *[1]Dr. Sayali Mahendra Shinde, [2]Dr. Renuka Suryawanshi, [3]Dr. Santosh Pawale. (2026). Comparative Pharmaceutico-Analytical and Invitro Antimicrobial Activity of Murcchita and Amurcchita Manjishthadi Taila in Propionibacterium Acnes... World Journal of Pharmaceutical Research, 15(17), 1883–1890.

ABSTRACT

Background: Manjishthadi Taila is a classical Ayurvedic medicated oil indicated for Pidaka and related skin conditions. Taila Murchhana is intended to improve the organoleptic quality, stability, and therapeutic utility of sesame oil. Objective: To compare Murcchita and Amurcchita Manjishthadi Taila through pharmaceutical preparation, physicochemical and chromatographic evaluation, microbiological quality assessment, and in vitro antibacterial activity against Propionibacterium acnes. Methods: Both formulations were prepared according to classical Sneha Kalpana procedures. Refractive index, specific gravity, iodine value, saponification value, acid value, pH, thin-layer chromatography (TLC), and total bacterial count were assessed. Antibacterial activity was evaluated by agar well diffusion against P. acnes, with streptomycin as the standard. Results: Murcchita and Amurcchita formulations showed inhibition zones of 16 mm and 9 mm, respectively; streptomycin produced 26 mm and the control 0 mm. The thesis reported a significant overall difference (one-way ANOVA: $F=93.86$, $p<0.0001$), with all pairwise comparisons significant by Tukey testing. The Murcchita sample had refractive index 1.47, specific gravity 0.91, iodine value 58, saponification value 190, acid value 4, and pH 6.48;

corresponding Amurcchita values were 1.48, 0.913, 70, 180, 6, and 6.35. Both samples had 0 CFU/mL. Conclusion: Both oils demonstrated antibacterial activity, while Murcchita Manjishthadi Taila showed greater in vitro inhibition of P. acnes. The findings support further standardized and replicated investigation of the influence of Murchhana on efficacy and stability.

KEYWORDS: Manjishthadi Taila; Murcchana; Sneha Kalpana; Propionibacterium acnes; antimicrobial activity; agar well diffusion; physicochemical evaluation.

1. INTRODUCTION

Ayurvedic pharmacology broadly comprises Rasashastra and Bhaishajya Kalpana. The latter includes herbal and organic preparations such as Swarasa, Kashaya, Churna, Taila, Vati, Avaleha, Asava, and Arishta, developed to promote health, longevity, and vitality.[1,2]

Sneha Kalpana denotes medicated oils and ghee prepared by controlled processing of a lipid base with herbal paste and a liquid medium. Such formulations function both as therapeutic agents and as carriers capable of incorporating water- and lipid-soluble constituents. They may also support preservation and sustained topical contact.[3,8,9]

Bhaishajya Ratnavali describes Manjishthadi Taila for Nilika, Pidaka, and Vyanga. Using Pidaka as the clinical reference, the present work compared Manjishthadi Taila prepared with Murcchita sesame oil and with untreated (Amurcchita) sesame oil.[4]

Acne involves inflammatory and non-inflammatory lesions associated with follicular obstruction, altered sebum, host inflammatory responses, and microbial activity. Propionibacterium acnes (currently Cutibacterium acnes) contributes to inflammatory acne through enzymatic activity and stimulation of innate inflammatory mediators.[5]

Synthetic topical antimicrobials can cause irritation or hypersensitivity, and antimicrobial resistance may limit effectiveness. Manjishtha, Laksha, Yashtimadhu, Matulunga, sesame oil, and goat milk are traditionally used in skin-related formulations. Medicated oils can spread over and remain in contact with the skin, supporting delivery of incorporated constituents.[6,10,11,12]

Taila Murchhana is traditionally undertaken to reduce undesirable odour, improve colour and stability, reduce acid value, and enhance therapeutic utility. Comparative evidence for

Murcchita and Amurcchita Manjishthadi Taila against P. acnes remains limited, providing the rationale for this study.[7,13,14,15]

Aim: To compare the pharmaceutical and analytical characteristics and in vitro antimicrobial activity of Murcchita and Amurcchita Manjishthadi Taila against Propionibacterium acnes.

2. MATERIALS AND METHODS

2.1 Study design and setting

The study comprised three components: (1) pharmaceutical preparation, (2) organoleptic and physicochemical evaluation, and (3) in vitro antimicrobial testing. Raw materials were procured from the local market, identified by the Department of Dravyaguna, and authenticated by a recognized research laboratory. Preparations were performed in the Department of Rasashastra and Bhaishajya Kalpana.

2.2 Pharmaceutical preparation

For Murchhana, 250 mL sesame oil was processed with Manjishtha (15.6 g) and 3.9 g each of Haridra, Lodhra, Musta, Nalika, Amalaki, Haritaki, Bibhitaki, Vatankura, and Hrivera, together with 1 L water. The oil was heated until frothing subsided, cooled, combined with the herbal paste and water, reheated with stirring until water evaporated and classical Taila Siddhi Lakshana appeared, cooled, and filtered. The final yield was 220 mL after 120 minutes.

Formulation	Oil base	Manjishtha	Laksha	Yashtimadhu	Matulunga	Goat milk	Water
Murcchita	220 mL Murcchita sesame oil	11 g	11 g	22 g	12 mL	440 mL	1760 mL
Amurcchita	250 mL sesame oil	12.5 g	12.5 g	25 g	13 mL	500 mL	2000 mL

For each formulation, powdered Kalka ingredients were mixed with Matulunga Swarasa and sufficient water. The paste, oil base, goat milk, and water were heated with continuous stirring until moisture evaporated and Taila Siddhi Lakshana were observed. The products were cooled, filtered through muslin cloth, and stored in airtight glass containers. Murcchita Manjishthadi Taila yielded 200 mL from 220 mL in 110 minutes; Amurcchita Manjishthadi Taila yielded 240 mL from 250 mL in 120 minutes.

2.3 Analytical evaluation

Organoleptic evaluation included colour, odour, physical appearance, and touch. Refractive index was measured with an Abbe refractometer at 40±0.1°C; specific gravity was measured with a 25 mL pycnometer at 25°C. Iodine value was determined by the Wijs method, saponification value by reflux with alcoholic potassium hydroxide and back-titration, and acid value by titration with alcoholic potassium hydroxide. The pH was measured at 25±2°C in an emulsion of 10 mL oil and 90 mL distilled water.

TLC was performed on silica gel using toluene:ethyl acetate:formic acid (5:4:1) as the mobile phase. Sample Rf values were compared with quercetin and gallic acid standards. Total bacterial count was assessed by spread plating 0.1 mL of a 10^-6 dilution on nutrient agar, followed by aerobic incubation at 30-37°C for 24-48 hours.

2.4 Antibacterial activity and statistics

Antibacterial activity against Propionibacterium acnes was assessed by agar well diffusion on Mueller-Hinton agar. Standardized inoculum was spread over the agar, wells were prepared with a sterile cork borer, and the test oils were introduced. After incubation at 37°C for 24 hours, zones of inhibition were measured in millimetres. Streptomycin served as the standard and an untreated control was included. The thesis reports one-way ANOVA followed by Tukey multiple-comparison testing, with $p<0.05$ considered significant.

3. RESULTS

3.1 Pharmaceutical and organoleptic findings

Murchhana changed sesame oil from light yellow to dark red and produced a homogeneous, aromatic oil. The Murcchita formulation was dark wine in colour with a pleasant characteristic aroma; the Amurcchita formulation was wine red with a characteristic odour. Both were smooth, homogeneous liquids and exhibited the reported Taila Siddhi Lakshana. Process loss was 30 mL during Murchhana, 20 mL during preparation of the Murcchita formulation, and 10 mL during preparation of the Amurcchita formulation.

3.2 Physicochemical, TLC, and microbiological findings

Parameter	Murcchita Manjishthadi Taila	Amurcchita Manjishthadi Taila
Refractive index	1.47	1.48
Specific gravity	0.91	0.913
Iodine value	58	70
Saponification value	190	180

Acid value	4	6
pH	6.48	6.35
Total bacterial count	0 CFU/mL	0 CFU/mL

On TLC, Murcchita Manjishthadi Taila showed an Rf of 0.54, matching the quercetin standard (0.54). Amurcchita Manjishthadi Taila showed an Rf of 0.49, close to the gallic acid standard (0.48). These spot correspondences indicate quercetin-like and gallic-acid-like constituents, respectively, but do not by themselves establish compound identity.

3.3 Antibacterial activity

Group	Mean zone of inhibition (mm)	Relative finding
Control	0	No inhibition
Streptomycin	26	Highest activity
Murcchita Manjishthadi Taila	16	Moderate activity
Amurcchita Manjishthadi Taila	9	Lower activity

The thesis reports one-way ANOVA results of SS treatment=438.00, df=2, MS=219.00; SS error=14.00, df=6, MS=2.33; F=93.86; $p<0.0001$. Tukey testing was reported as significant for streptomycin versus Murcchita (mean difference 10 mm), streptomycin versus Amurcchita (17 mm), and Murcchita versus Amurcchita (7 mm). The activity order was streptomycin > Murcchita Manjishthadi Taila > Amurcchita Manjishthadi Taila.

4. DISCUSSION

The study integrates classical pharmaceutical processing with laboratory quality assessment. Both formulations reached the expected Sneha Paka end points and yielded smooth, homogeneous oils. The darker colour and more pleasant aroma of the Murcchita preparation are consistent with extraction of colouring and aromatic constituents during the additional Murchhana stage. The higher process loss in the Murcchita pathway reflects its extra heating and filtration step.

The physicochemical profiles were similar in density and refractive index but differed in iodine, saponification, and acid values. Murcchita Manjishthadi Taila had a lower iodine value (58 versus 70), a higher saponification value (190 versus 180), and a lower acid value (4 versus 6). Within the study, the lower acid value was interpreted as less free-fatty-acid formation and reduced hydrolytic deterioration. However, without replicate determinations, variability estimates, prespecified acceptance limits, or accelerated stability testing, these differences should be considered descriptive rather than definitive evidence of longer shelf life.

Both pH values were mildly acidic (6.48 and 6.35), a range potentially compatible with topical application. Nevertheless, the method measured an oil-water emulsion rather than the neat oil; therefore, direct comparison with physiological skin-surface pH requires caution. The absence of detectable bacterial growth (0 CFU/mL) indicates satisfactory microbiological quality at the time tested, but does not establish preservative effectiveness or long-term sterility.

TLC suggested different detectable marker profiles: an Rf matching quercetin in the Murcchita sample and an Rf close to gallic acid in the Amurcchita sample. Because Rf matching is presumptive and the formulations were not reported against the same marker panel or with densitometric quantification, the results cannot determine relative concentrations or prove that Murchhana generated the antibacterial difference. Confirmatory HPTLC/HPLC with common standards and replicate samples would be required.

The principal biological finding was a 16 mm inhibition zone for Murcchita Manjishthadi Taila compared with 9 mm for Amurcchita Manjishthadi Taila, while streptomycin produced 26 mm. The reported ANOVA and Tukey analysis indicated statistically significant differences. The larger inhibition zone after Murchhana is compatible with the hypothesis that additional processing altered extractable phytoconstituents or their diffusion from the lipid matrix. Other explanations include differences in oil viscosity, well loading, concentration, diffusion behaviour, or batch variability. Agar diffusion zones reflect both antibacterial action and physical diffusion and should not be interpreted as potency measures in isolation.

Important reporting limitations include the absence of raw replicate values and detailed sample sizes despite ANOVA error degrees of freedom, lack of reported oil volume/concentration per well, limited culture-standardization details, and no minimum inhibitory or bactericidal concentration. The methods section of the thesis also contains a wording error that identifies “Streptomycin” as the study organism; the results clearly identify P. acnes as the organism and streptomycin as the standard. Future work should use authenticated C. acnes strains, anaerobic incubation appropriate to the organism, replicated independent batches, vehicle controls, blinded measurements, MIC/MBC assays, chemical profiling, and stability studies.

5. CONCLUSION

Murcchita and Amurcchita Manjishthadi Taila were successfully prepared and showed acceptable organoleptic, physicochemical, chromatographic, and microbiological characteristics within the reported study. Both formulations inhibited Propionibacterium acnes in vitro, and Murcchita Manjishthadi Taila produced a larger inhibition zone than the Amurcchita formulation (16 mm versus 9 mm). The reported statistical analysis supported a significant difference among treatments. These findings suggest that Murchhana may influence the quality attributes and antibacterial performance of Manjishthadi Taila; confirmation requires rigorously replicated chemical, microbiological, stability, and clinical investigations.

REFERENCES

1. Department of Rasashastra and Bhaishajya Kalpana. RTAM Ayurved College. Available from: https://rtam.edu.in/rasashastra-bhaishajya-kalpana/
2. Department of Bhaishajya Kalpana and Rasa Shastra. Sri. Sri. College of Ayurvedic Science and Research. Available from: https://srisriayurvedacollege.edu.in/bhaishajya-kalpana-rasa-shastra/
3. Thakur TD, Mane RG. A review on Sneha Kalpana in Ayurveda. Journal of Ayurveda and Integrated Medical Sciences., 2018; 3(4): 181.
4. Dattashastri A. Bhaishajya Ratnavali. Chaukhamba Prakashan. Adhyaya 5, verse, 110; 12: 667.
5. DermNet. Bacteria in acne. Available from: https://dermnetnz.org/topics/bacteria-in-acne
6. Forest Essentials. Importance of oils in Ayurveda. Available from: https://www.forestessentialsindia.com/blog/importance-of-oils-in-ayurveda.html
7. Udayakumar ET. A study on Taila Murchana with a comparative analysis of Pancha Pallava Murcchita Tila Taila, Manjishtaadi Yoga Murcchita Tila Taila and Amurcchita Tila Taila. Parul University; 2024. Available from: https://www.researchgate.net/publication/378739300
8. Tripathi B. Charaka Samhita of Agnivesha, elaborated by Charaka and Drudhabala with Charaka Chandrika Hindi commentary. Varanasi: Chaukhamba Surbharati Prakashan; 2008. Sutrasthana 13/4: 218.
9. Tripathi B. Charaka Samhita of Agnivesha, elaborated by Charaka and Drudhabala with Charaka Chandrika Hindi commentary. Varanasi: Chaukhamba Surbharati Prakashan; 2008. Kalpasthana 12/4: 317.

10. Trikamji Acarya YJ, editor. Sushruta Samhita with commentary of Dalhana. 7th ed. Varanasi: Chaukhambha Orientalia; 2002. Chikitsa Sthana 21/10: 211.
11. Gupta A. Ashtanga Hridaya. Varanasi: Chowkhamba Prakashan; 2009. Kalpasthana 8/11: 230.
12. Chunekar K, editor. Bhavaprakash Nighantu. Varanasi: Chaukhamba Sanskrit Samsthana; 2013. Madhyama Khanda, Mukharoga Chikitsa, chapter 66, verses 159-160:719.
13. 1940_pdf.pdf. Source link recorded in thesis: https://share.google/zeW2MDhEuCzL4M8Ss
14. Tripathi B. Charaka Samhita of Agnivesha, elaborated by Charaka and Drudhabala with Charaka Chandrika Hindi commentary. Varanasi: Chaukhamba Surbharati Prakashan; 2008. Sutrasthana 13/4:218.
15. Gupta A. Ashtanga Hridaya. Varanasi: Chowkhamba Prakashan; 2009. Sutrasthana 13/4:230.