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Research Article

Comparative Quality Assessment of Murchita Tila Taila Focusing on Market Samples

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ABSTRACT

Introduction: Sneha Kalpana is a vital Ayurvedic pharmaceutical process, wherein lipid-based formulations are prepared using medicinal herbs. Tila Taila (sesame oil) is frequently used, and Sneha Murchana is performed prior to detoxify the oil and enhance its stability. **Materials and Methods:** An in-house Murchita Tila Taila was prepared following classical Sneha Murchana procedures as per Ayurvedic Formulary of India. It was compared with three market samples from GMP-certified pharmacies. **Physicochemical parameters—**refractive index, specific gravity, saponification value, acid value, iodine value, and rancidity—were assessed per Ayurvedic Pharmacopoeia of India at a certified Drug Testing Laboratory. **Results:** All samples, including market and in-house Murchita Tila Taila, showed similar organoleptic properties and comparable refractive index (1.482–1.483), specific gravity (0.915–0.917), saponification (192.57–210.27), acid values (1.55–2.78), and tested negative for rancidity, indicating acceptable quality and shelf life. However, iodine values varied significantly, with market samples (107.85–123.11) showing higher unsaturation than the in-house sample (57.84), which may influence therapeutic efficacy. **Discussion:** The absence of standardized parameters for herbal formulations often leads to substandard products, affecting their efficacy. This study compared key physicochemical parameters of market-available Murchita Tila Taila with a genuine in-house sample. The following parameters were evaluated: specific gravity, rancidity, iodine value, acid value, refractive index, and saponification value. While most values were comparable and no rancidity was detected, market samples showed significantly higher iodine values, indicating greater unsaturation that may impact therapeutic effects. The traditional Sneha Murchana process enhances oil stability and quality, highlighting the need for standardization to ensure consistent safety and efficacy in herbal oils.

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INTRODUCTION

Sneha Kalpana is a cornerstone of traditional Ayurvedic pharmaceuticals, involving the processing of lipid-based substances such as *Ghrita* (ghee), *Taila* (oil), *Vasa* (muscle fat), and *Majja* (bone marrow) with medicinal herbs¹. Among these, *Ghrita* and *Tila Taila* (sesame oil) are most frequently used due to their superior absorption and therapeutic properties. This technique involves the meticulous cooking of fats with herbal paste (*Kalka*) and aqueous media (herbal decoctions, milk, curd, etc.) under controlled heat, resulting in the infusion of the active herbal constituents into the lipid base. Prior to the base oils being used in formulation procedures, they must undergo *Sneha Murchana*, a unique Ayurvedic method of purifying and enhancing them. *Sneha Murchana*² is a crucial prelude to this formulation process. This process specifically aims to remove undesirable odors (*Gandhadoshha*), impurities (*Amadosha*), and to enhance the colour, aroma, shelf life, and overall therapeutic efficacy, better assimilation of active constituents, enhanced stability and improved medicinal properties and clinical outcomes. Maintaining the integrity and quality of traditional preparations has become a critical problem in the current environment, as Ayurveda is becoming more and more well-known worldwide and the manufacturing of Ayurvedic formulations is becoming more and more commercialized. Commercially available *Murchita Tila Taila* products are widely available on the market, but their quality varies greatly because of variations in the processing methods, and adherence to traditional Ayurvedic practices. Lack of

standardization and adulteration continue to be significant issues. There is a need for strict quality control is required for widely used ayurvedic formulations especially the medicated oils as per recommended standards. Attempt has been made to compare different market samples of *Murchita tila taila* with inhouse sample to assess the quality as per standards of Ayurvedic Pharmacopeia of India. to set benchmarks for important physicochemical criteria. It emphasizes the critical role that quality control plays in maintaining traditional purity and boosting consumer confidence in Ayurvedic products.

MATERIALS AND METHODS:

In the present study, *Murchana* of *Tila Taila* (Sesame Oil) was performed following the standard procedure². A comparative physicochemical evaluation was carried out between the in-house prepared *Murchita Tila Taila* and three other samples obtained from GMP-certified pharmacies. The commercially procured oils were labelled as Sample 1, Sample 2, and Sample 3, while the in-house prepared oil was designated as Sample 4. This comparison aimed to assess quality variations among the samples. The analysis was conducted using standard parameters in accordance with classical guidelines and pharmacopeial standards. All samples were tested at the Drug Testing Laboratory Lic. No. TL-8/2011. approved by AYUSH, Government of India, situated at KAHER's Shri B.M.K. Ayurveda Mahavidyalaya, Shahpur, Belagavi.

Pharmaceutical method:

Ingredients for *Murchana* of *Tila Taila* ²:

S. No	Drug	Latin name	Part used	Quantity	Quantity for 100ml
1	Manjishta	<i>Rubia Cordifolia</i> Linn.	Stem	1/16 th part	6.25gms



2	Haridra	<i>Curcuma longa</i> Linn.	Rhizome	1/64 th part	1.56gms
3	Musta	<i>Cyperus rotundus</i> Linn.	Rhizome	1/64 th part	1.56gms
4	Lodhra	<i>Symplocos racemosa</i> Roxb.	Stem bark	1/64 th part	1.56gms
5	Nalika	<i>Cinnamom tamala</i> Nees.	Stem bark	1/64 th part	1.56gms
6	Amalaki	<i>Emblica officinalis</i> Gaertn.	Pericarp	1/64 th part	1.56gms
7	Haritaki	<i>Terminalia chebula</i> Retz.	Pericarp	1/64 th part	1.56gms
8	Vibhitaki	<i>Terminalia belerica</i> Roxb.	Pericarp	1/64 th part	1.56gms
9	Suchipushpa	<i>Pandanus tectorius</i> Sol.	Root	1/64 th part	1.56gms
10	Vata	<i>Ficus bengalensis</i> Linn.	Rhizopods	1/64 th part	1.56gms
11	Tila taila	<i>Sesamum indicum</i> Linn.	Seed oil	1 part	100ml
12	Water			Equal to taila	100ml

Instruments & Equipment:

1. Khalva Yantra (Pestle and mortar)
2. Gas cylinder with stove and lighter.
2. Stainless steel vessels
3. Spoon
4. Cotton cloth/filter cloth
5. Wide mouthed glass bottle for storage.

Preparation of In-house sample:

The in-house sample was prepared following the standard method as per AFI (Ayurvedic Formulary of India) guidelines³, ensuring all classical processing steps and quality markers were appropriately adhered to.

Precautions:

1. Mild to moderate heat was given throughout the Moorchana procedure.
2. Over flowing of oil was avoided for each time.
3. To prevent Kalka from adhering to the vessel's bottom, stirring was done often throughout the operation.

Analytical method:⁴

All analytical tests were conducted as per the standards prescribed in the *Ayurvedic Pharmacopoeia of India*. The analysis was carried out at the Drug Testing Laboratory Lic. No-8/2011, approved by AYUSH, Government of India, located at KAHER's Shri B.M.K. Ayurveda Mahavidyalaya, Shahapur, Belagavi.

Observation And Results:

Organoleptic characters:

Parameters	Sample 1	Sample 2	Sample 3	Sample 4
Form	Taila	Taila	Taila	Taila
Colour	Light brown	Light brown	Light brown	Golden yellow
Odour	Pleasant	Pleasant	Pleasant	Pleasant

Modern Parameters as per API Standards:

Parameters	Sample – 1	Sample – 2	Sample – 3	Sample – 4	Parameters
Refractive Index	1.482	1.482	1.483	1.483	Refractive Index
Specific gravity	0.915	0.917	0.916	0.915	Specific gravity
Saponification value	210.269	192.572	197.166	194.11	Saponification value
Acid value	2.781	1.551	2.237	2.231%	Acid value
Iodine value	123.111	107.848	119.060	57.835	Iodine value
Rancidity	Negative	Negative	Negative	Negative	Rancidity

DISCUSSION:

The absence of standardized parameters for herbal formulations has led to frequent cases of substandard and adulterated crude drugs. Ensuring the quality of herbal crude drugs and their active components is crucial to maintaining therapeutic effectiveness. In Ayurveda, it is vital to standardize preparations to maintain consistent concentrations of active ingredients and preserve their efficacy through physicochemical stability. This study focused on evaluating the authenticity of market-available *Murchita Tila Taila* samples by comparing their physicochemical characteristics with that of a genuinely prepared in-house *Murchita Tila Taila*. The evaluation was carried out in two phases—physicochemical analysis of market samples followed by comparison with the in-house preparation. The following parameters were evaluated: specific gravity, rancidity, iodine value, acid value, refractive index, and saponification value. As per Ayurvedic principles, the *Sneha Murchana*

process is performed to eliminate *Ama Dosha* (toxins or impurities) from the base oil and to improve the absorption potential of the medicinal formulation. The heat applied during this process helps in evaporating moisture, which in turn reduces the tendency of the oil to become rancid. From a modern perspective, this procedure is similar to the oil refinement process, which aims to eliminate impurities such as free fatty acids, phospholipids, moisture, and colorants that may adversely affect the oil's physical and chemical properties. The concept of *Ama Dosha* can be scientifically associated with rancidity. Oxidation and hydrolysis are key processes that lead to rancidification, resulting in the formation of harmful compounds like aldehydes and peroxides. These degraded lipids not only have unpleasant taste and odor but are also linked to carcinogenic effects, aging, and increased cholesterol levels upon prolonged use⁵. By preventing lipid peroxidation and adding antioxidant qualities, the *Murchana* process raises the medicinal oil's overall therapeutic value. In the current study, the

physicochemical parameters used for assessment included refractive index, specific gravity, saponification value, acid value, iodine value, and rancidity. Refractive index values were found to be 1.482, 1.482, 1.483 for the market samples, while the in-house sample showed 1.483—all within acceptable ranges. A lower refractive index may indicate decreased density, potentially caused by heating, which spreads the fat molecules and increases the volume. Specific gravity values ranged from 0.915 to 0.917 across all samples, including the in-house sample. This parameter depends on the composition of the oil; increased aromatic compounds and reduced saturated fats lead to higher specific gravity, which is beneficial for health⁶. The market samples had saponification values of 210.269, 192.572, and 197.166, whereas the in-house sample had values of 194.11. Lower saponification values suggest a higher presence of long-chain fatty acids, which are advantageous for cardiovascular health and inflammation regulation⁷. The acid values of the samples were 2.781, 1.551, and 2.237, while the in-house sample had a value of 2.231%. This parameter indicates the free fatty acid content. Lower values reflect fewer free fatty acids, which translates to higher oil stability⁸. All samples tested negative for rancidity, suggesting the absence of moisture and satisfactory shelf life. Higher rancidity would compromise therapeutic potential and shelf stability. Among all parameters, the only significant variation was observed in the iodine value. The in-house sample showed an iodine value of 57.835, whereas the market samples recorded higher values of 123.111, 107.848, and 119.060. The iodine value indicates the degree of unsaturation in fatty acids. Oils with higher iodine values have more unsaturated fats, which contribute positively to heart health, cholesterol balance, and anti-inflammatory effects⁹.

CONCLUSION:

The study highlights the critical role of the Murchana process in enhancing oil stability and therapeutic efficacy through natural antioxidant activity. The in-house sample, prepared using traditional methods, met all standard parameters, unlike the minor deviations seen in market samples. This emphasizes the need for standardized processing and strict quality control to ensure the authenticity, safety, and effectiveness of Ayurvedic medicated oils.

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