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MACROSCOPIC AND PHYSIOCHEMICAL DESCRIPTION OF *SARJIKSHAR TAILA*

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ABSTRACT

Sarjikshar Taila is a classical Ayurvedic formulation prepared using *Sarjikshar*, *Moolaka*, *Hingu*, *Pippali*, *Shunthi*, *Shatpushpa*, *Tila Taila*, and *Shukta*. The present study was undertaken to evaluate its physicochemical, microscopic, and identification characteristics for the purpose of quality validation and standardization. The formulation was prepared under controlled, standardized conditions and subjected to detailed macroscopic and physicochemical analyses. The prepared *Sarjikshar Taila* was found to exhibit a reddish-yellow colour and a characteristic odour. Important physicochemical parameters, including specific gravity, loss on drying, refractive index, and saponification value, were assessed. A comparatively low acid value indicated minimal chances of oil decomposition and confirmed the stability of the formulation. Clinically, *Sarjikshar Taila* is widely recommended in *Karna Roga* due to its *Vata-Kapha Shamaka* properties. Local application of medicated oil is advantageous as it protects the mucosal barrier, enhances percutaneous absorption, and ensures rapid therapeutic action. The results of this pharmaceutical and analytical evaluation provide preliminary standard parameters for the preparation of *Sarjikshar Taila*. These findings may serve as a reference standard for future research and quality control of the formulation.

KEYWORDS: *Sarjikshar Taila*, *Karna Roga*, *Karna Badhirya*, *Karna Shoola*, Macroscopic parameters, Physio-chemical parameters.

INTRODUCTION

Sarjikshar Taila, as mentioned in *Bhaishajyaratnavali*[1], is a classical formulation specifically indicated for *Karna Roga* (ear disorders), particularly those dominated by *Vata* and *Kapha* vitiation. The constituents of this medicated oil possess predominant *Vata-Kapha Shamaka* properties, while their *Tikshna* (penetrating) and *Katu Rasa* (pungent) attributes facilitate deep tissue penetration, mucolysis, and effective reduction of local inflammatory processes. These qualities collectively help in alleviating obstruction (*Srotorodha*) and promoting the liquefaction and expulsion of accumulated *Kapha Dosha*, which forms the core of the pathogenesis of *Badhirya*.

The formulation comprises *Sarjikshar*, *Moolaka*, *Hingu*, *Pippali*, *Shunthi*, and *Shatapushpa*, each contributing synergistically to the therapeutic action. *Sarjikshar* provides potent *Kaphahara* and *Shophaghna* (anti-inflammatory) effects due to its alkaline nature, aiding in the breakdown of thick secretions lodged within the middle ear. Ingredients like *Hingu*, *Pippali* and *Shunthi* are known for their *Deepana*, *Pachana*, and *Anulomana* actions, which support improved microcirculation, reduction of congestion, and resolution of sterile inflammation. *Shatapushpa* and *Moolaka* further enhance the decongestant and mucolytic actions of the formulation.

These ingredients are processed in *Moorchita Tila Taila*, which increases the bioavailability, stability, and therapeutic penetrability of the medicated oil. *Tila Taila* itself is considered *Vata Shamaka*, *Sukshma* (subtle), and *Yogavahi*, enabling the active components to reach deeper tissues of ear.

Thus, *Sarjikshar Taila*, by virtue of its pharmacodynamic properties and its route of administration, serves as a rational therapeutic option in the Ayurvedic management of *Karna Parnada, Karna Shoola, Karna Badhirya, Karna Sarava*.

METHODOLOGY

Pharmaceutical study Collection of drugs

The raw material like *Sarjikshar*, *Moolaka*, *Hingu*, *Pippali*, *Shunthi*, *Shatpushpa*, *Tila Taila* and *Shukta* (Table 1) for the preparation of *Sarjikshar Taila* was collected from the market and after proper verification in the Dept. of Dravya Guna, the final drug was prepared under the guidelines of the Dept. Of Rasa Shastra and Bhaisajya Kalpana in Rajiv Gandhi Government Postgraduate Ayurvedic Medical College pharmacy, Paprola.

Table 1: Ingredients of *Sarjikshar Taila*.

Sr. No.	Ingredients	Botanical name	Family	Part used	Quantity
1.	*Sarjikshar*	*Fagonia cretica* Linn.	Zygophllaceae	*Panchanga*	1/6 Part
2.	*Moolaka*	*Raphanus sativus* Linn.	Cruciferae	Root	1/6 Part
3.	*Hingu*	*Ferula narthex* Boiss.	Umbelliferae	Extract	1/6 Part
4.	*Pippali*	*Piper longum* Linn.	Piperaceae	Fruit	1/6 Part
5.	*Shunthi*	*Zingiber officinale* Rosc.	Zingiberaceae	Rhizome	1/6 Part
6.	*Shatpushpa*	*Anthem sowa* Kurz.	Apiaceae	Fruit	1/6 Part
7.	*Moorchita Tila Taila*	*Sesamum indicum* Linn.	Pedialiaceae	Seed oil	1 Part
8.	*Shukta*				4 Part

Preparation of *Sarjikshar Taila*

Sarjikshar Taila was prepared in the pharmacy of Department of Rasa Shastra and Bhaishajya Kalpana, Rajiv Gandhi Government Postgraduate Ayurvedic Medical College pharmacy, Paprola.

Preparation of *Sarjikshar Taila* was done as per the general method of preparation of *Taila Kalpana* i.e. 1/4th part of *Kalka* (paste), 1 part of *Tila Taila* (sesame oil) and 4 parts of *Drava Dravya* (liquid) (1/4:1:4).

METHOD OF PREPARATION

- The contents of the *Sarjikshar Taila* were identified and verified according to classical Ayurvedic references.
- Raw materials were collected, authenticated, and examined as per standard Ayurvedic quality parameters
- To initiate the formation of *Shukta*, the required *Kalka Dravya* was mixed with *Guda* and kept in a plastic container undisturbed for seven days, allowing natural *Sandhana Kriya* (fermentation) to occur.
- The *Moorchhana Dravya* was ground using a pulveriser machine to prepare it for the *Moorchhana* process.
- *Tila Taila* was subjected to *Moorchhana* to enhance its therapeutic qualities by removing undesirable components.
- The *Moorchhita Tila Taila* was filtered using a clean cloth to obtain a clear and refined base oil.
- The *Sidhi Dravya* necessary for the preparation of *Sarjikshar Taila* was finely powdered.
- The prepared *Kalka Dravya* and the fermented *Shukta* were added to the *Moorchhita Tila Taila*.
- The mixture was subjected to *Sneha Paka* over *Madhyama Agni* (medium flame), with continuous stirring to prevent sticking or burning.
- The heating was continued until the manifestation of appropriate *Sneha Siddhi Lakshana* were observed.
- After confirming the proper *Siddhi* of the oil, *Hingu* and *Sarjikshar* were added to the *Siddha Taila*.
- The medicated oil was filtered to remove any coarse particles.
- After cooling, the oil was filled into clean, dry, and sterilised containers.

Finally, added in container and sealed with label at Charaka pharmacy of RGGPG Ayurvedic College and Hospital, Paprola, Distt. Kangra (H.P.)

Taila Siddhi Lakshana[2]

- *Vartivat Sneha Kalka* - able to role the *Varti* of *Kalka*
- Shabdahino Agni Nikshipta- No crackling sound heard on heating over the fire
- *Phenodgama Taila Siddhi Lakshana*: frothing at the end of *Taila*
- *Gandha Utpatti* - mild alkaline odour was appreciated
- *Varna Utpatti* - green colour of *Taila* noted
- *Rasa Utpatti* - not tasted.

Table 2: Quantity of *Taila* taken and loss.

Taila	Quantity
Total *Tila Taila* taken	4.0 L
Obtained Taila	3.2 L
Loss	0.8 L

Analytical Study

A. Macroscopic Description (Organoleptic characters)

Various parameters of the material such as appearance, colour, odour of the formulations was observed and recorded.

B. Physio-Chemical Analysis

Physio-chemical analysis was carried out based on the following parameters:

1. Loss on drying
2. Specific gravity
3. R.I.
4. Saponification value
5. Acid value.

C. Identification Tests

1. Qualitative test
2. Thin layer chromatography.

1. Loss on drying (Determination of Moisture Content)

The Procedure here determines the amount of volatile matter (i.e., water drying off from the drug). For substances appearing to contain water as the only volatile constituent, the procedure given below is appropriately used. Place about 10 g of the drug (without preliminary drying) after accurately weighing (accurately weighed to within 0.01 g) it in a tared evaporating dish. After placing the above said amount of the drug in the tared evaporating dish, dry at 105^0 C for 5 hours, and weigh. Continue the drying and weighing at one-hour intervals until the difference between two successive weighing corresponds to not more than 0.25 percent. Constant weight is reached when two consecutive weighs after drying for 30 minutes and cooling for 30 minutes in a desiccator, show not more than 0.01 g difference. The petri dish was taken out, self-cooled and weighed immediately. The weight loss i.e. loss on drying was calculated and expressed as % w/w.[3]

2. Specific gravity

The specific gravity of a liquid is the weight of a given volume of the liquid at 250C (unless otherwise specified) compared with the weight of an equal volume of water at the same temperature, all weighing being taken in air.

Method: Proceed as described under wt. per ml. Obtain the specific gravity of the liquid by dividing the weight of the liquid contained in the pycnometer by the weight of water contained, both determined at 250 C unless otherwise directed in the individual monograph.[4]

3. RI (Refractive Index)

The refractive index (η) of a substance regarding air is the ratio of the sine of the angle of incidence to the sine of the angle of refraction of a beam of light passing from air into the substance. It varies with the wavelength of the light used in its measurement. It is measured with an Abbemat refractometer.[5]

4. Saponification value

The saponification value is the number of mg of potassium hydroxide required to neutralize the fatty acids, resulting from the complete hydrolysis of 1 g of the oil or fat, when determined by the following method.

Dissolve 35 to 40 g of potassium hydroxide in 20 ml water, and add sufficient alcohol to make 1,000 ml. Allow it to stand overnight, and pour off the clear liquor. Weigh accurately about 2 g of the substance in a tared 250 ml flask, add 25 ml of the alcoholic solution of potassium hydroxide, attach a reflux condenser, and boil on a water-bath for one hour, frequently rotating the contents of the flask cool and add 1 ml of solution of phenolphthalein and titrate the excess of alkali with 0.5 N hydrochloric acid. Note the number of ml required

(a)Repeat the experiment with the same quantities of the same reagents in the manner omitting the substance. Note the number of ml required

(b)Calculate the saponification value from the following formula

$$\text{Saponification Value} = \frac{(b-a) \times 0.02805 \times 1.000}{W}$$

Where 'W' is the weight in g of the substance taken.[6]

5. Acid value

The acid value is the number of mg of potassium hydroxide required to neutralize the free acids in 1 g of the substance, when determined by the following method: Weigh accurately about 10 g of the substance (1 to 5) in the case of a resin into a 250 ml flask and add 50 ml of a mixture of equal volumes of alcohol and solvent ether, which has been neutralized after the addition of 1 ml of solution of phenolphthalein. Heat gently on a water bath, if necessary until the substance has completely melted, titrate with 0.1 N potassium hydroxide, shaking constantly until a pink colour which persists for fifteen seconds is obtained. Note the number of ml required.

Calculate the acid value from the following formula

$$\text{Acid Value} = \frac{a \times 0.00561 \times 1000}{W}$$

Where 'a' is the number of ml of 0.1 N potassium hydroxide required and 'W' is the weight in g of the substance taken.[7]

Identification tests

1. Qualitative test

It is a chemical test for the screening and identification of bioactive chemical constituents like alkaloids, carbohydrates, glycosides, saponins, phenolic compounds phytosterols, proteins, amino acids, flavonoids, and tannins in drugs. Different methods are used for different constituents.

2. Thin layer chromatography (TLC)

Thin-layer chromatography is a technique in which a solute undergoes distribution between two phases,

stationary phase acting through adsorption and a mobile phase in the form of a liquid. The adsorbent is a relatively thin, uniform layer of dry finely powdered material applied to a glass, plastic, or metal sheet or plate. Precoated plates are most commonly used. Separation may also be achieved based on partition or a combination of partition and adsorption, depending on the particular type of support, its preparation, and its use with different solvent. Identification can be effected by observation of spots of identical Rf value and about equal magnitude obtained, respectively, with an unknown and a reference sample chromatographed on the same plate. A visual comparison of the size and intensity of the spots usually serves for semi-quantitative estimation.[8]

OBSERVATIONS AND RESULTS

The analytical studies like macroscopic and physio-chemical were carried out results are given in Table 3.

Table 3.

Sr. No.	Test	DTL Result
1.	**Macroscopic tests**	
a.	Appearance	Medicated oil
b.	Colour	Reddish yellow
c.	Odour	Characterstics
2.	**Physiochemical tests**	
a.	Loss on drying	0.35%
b.	Specific Gravity	0.920
c.	RI	1.473
d.	Saponification Value	197
e.	Acid Value	2.06
3.	**Identification tests**	
a.	Qualitative test	-ve test for mineral oil
b.	Thin Layer Chromatography	Rf Value 0.13, 0.17,0.33,0.48, 0.74, 0.82 Shows the presence of Til oil.

DISCUSSION

The results of the physicochemical tests indicate that *Sarjikshar Taila* has a high saponification value, which suggests its potential for quick absorption and penetration into the skin. The low acid value indicates the oil's stability and minimal risk of decomposition. The TLC results confirm the presence of *Tila Taila*, which is a key ingredient in the preparation of *SarjiksahrTaila*. The Rf values obtained are consistent with the expected values for *Tila Taila*, further validating the identity of the oil. The absence of mineral oil in the identification tests ensures the safety and efficacy of the preparation. Overall, the results demonstrate the quality and authenticity of *Sarjikshar Taila*, supporting its traditional use in *Ayurvedic* medicine for various conditions.

CONCLUSION

The macroscopic tests revealed that the medicated oil, *Sarjikshar Taila* has a reddish-yellow color and a characteristic odor. The physicochemical tests showed a loss on drying of 0.35%, specific gravity of 0.920, and refractive index (RI) of 1.473. The saponification value was found to be 197, and the acid value was 2.06. The identification tests confirmed the absence of mineral oil, and the Thin Layer Chromatography (TLC) revealed the presence of *Tila Taila*, with Rf values of 0.13, 0.17,0.33,0.48, 0.74 and 0.82.

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