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## Pharmaceutico-Analytical Study of *Tulasiswarasadi Taila* - An Ayurvedic Polyherbal Formulation

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### ABSTRACT

*Tulasiswarasadi Taila* is a type of medicated oil. It is a preparation in which oil, a fine paste of the drugs specified in the formulation composition and prescribed liquid media is being boiled together. The efficacy of a formulation can be increased by processing medicinal herbs with different types of oil. *Tulasiswarasadi Taila* has been mentioned in *Sahasrayogam* in the context of *Taila Prakrana*. The ingredients of *Tulasiswarasadi Taila* are *Tulasi Patra* (leaves) *Swarasa* (juice), *Kundrushka* and *Tila Taila* (sesame oil). *Tulasiswarasadi Taila Nasya* (Errhine therapy) has been mentioned for *Nasadaurgandhya* and *Pratishyaya* (Allergic Rhinitis). A drug should always be standardized to make it effective in pacifying the disease and it should not create any side effects or complications. Hence, current study was taken to standardize and analyse the *Tulasiswarasadi Taila* by developing standard protocol for testing. The value of loss on drying, specific gravity, refractive index, saponification value, acid value and iodine value was found to be 0.79%, 0.9219, 1.52, 177.668, 11.781 and 57.31, respectively for *Tulasiswarasadi Taila*. On HPTLC scan, at 254nm 13 peaks with major peak at  $R_f$  0.15 contributing 23.19% area and at 366nm 3 peaks with major peaks at  $R_f$  0.02 contributing 52.46% area was noted. These parameters can be set as standard values to derive quality constants for *Tulasiswarasadi Taila*.

### KEYWORDS

*Tulasiswarasadi Taila*, Pharmaceutico-Analytical, Standardization



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## INTRODUCTION

*Tulasiswarasadi Taila* is a kind of *Sneha Kalpana* (unctuous substance). The medicinal herbs, when processed with *Sneha* to increase its efficacy, it is known as *Sneha Kalpana*. Medicated *Taila* is a preparation in which *Taila*, fine paste (*Kalka*) of the drugs and liquid media (*Swarasa /Kashaya* Etc.) is being boiled in a quantity specified in the formulation composition<sup>1</sup>. *Tulasiswarasadi Taila* (oil) is being indicated internally, in the form of *Nasya* (errhine therapy) and *Snehapana* for *Rogashamanartha* (alleviating disease) especially in *Nasadaurgandhya* and *Pratishyaya*. The drug has been mentioned in *Sahasrayogam* in the context of *Taila Prakrana*<sup>2</sup>.

The ingredients of *Tulasiswarasadi Taila* are *Tulasi Patra* (leaves) *Swarasa* (juice), *Kundrushka* and *Tila Taila*. In *Ayurveda*, the plant and mineral based medicines has been mentioned for treatment of various diseases with a view of proper knowledge of the drugs. The classical medicines should be examined precisely before prescribing,

**Table 1: Ingredients of *Tulasiswarasadi Taila***

S.no.	Contents	Latin name	Part used	Quantity
1.	<i>Tulasi Swarasa</i>	<i>Ocimum Sanctum</i> Linn.	<i>Patra Swarasa</i>	24 litres
2.	<i>Kundrushka</i>	<i>Boswellia Serrata</i> Roxb.	<i>Niryasa</i>	750 gm
3.	<i>Tila</i>	<i>Sesamum indicum</i> Linn.	<i>Oil</i>	6 litres

With the help of end runner, 24 litres *Tulasi Patra Swarasa* (juice) was extracted from 42 kg fresh leaves of *Tulasi*. The

to yield better outcome. The lack of data about mechanism of action results in improper use of numbers of multidrug formulations. Many standard testing protocol were implemented to standardize and analyse the *Tulasiswarasadi Taila* in the current study<sup>3,4</sup>.

## MATERIALS AND METHODS

### Collection of Raw drugs

*Tulasi* leaves were procured from local farm around Jamnagar, *Kundrushka* was procured from local market and *Tila Taila* was procured from Pharmacy of I.P.G.T and R.A, Gujarat Ayurved University at Jamnagar. Before processing these were recognized and authenticated at Department of Pharmacognosy of I.P.G.T and R.A, Gujarat Ayurved University at Jamnagar.

### Preparation of *Tulasiswarasadi Taila*

*Tulasi* (*Ocimum Sanctum* Linn.) *Patra Swarasa*, *Kundrushka* (*Boswellia Serrata* Roxb.) and *Tila* (*Sesamum indicum* Linn.) *Taila* are the ingredients of *Tulasiswarasadi Taila* (Table 1).

ingredients, part used, quantity and preparation of *Tulasiswarasadi Taila* was followed as per the reference of



*Sahasrayogam*. *Taila-Paka Vidhi* was adopted to prepare *Tulasiswarasadi Taila* <sup>5</sup>.

### Pharmaceutical Analysis

Different physico-chemical parameters that were assessed at pharmaceutical chemistry lab of I.P.G.T and R.A, Gujarat Ayurved University at Jamnagar were as follows:

1. Organoleptic examination
2. Refractive index
3. Loss on drying
4. Specific gravity
5. Saponification Value
6. Acid value
7. Iodine Value
8. HPTLC

### Methodology<sup>4</sup>

**Loss on drying-** 2g of *Tulasiswarasadi Taila* was placed in an evaporating dish and tared. It was kept for drying for 5 hours at 105°C, in hot air oven and then again weighed.

Loss on drying %=

$\frac{\text{Difference in weight} \times 100}{\text{Weight of sample in gram}}$

Weight of sample in gram

**Refractive index** – To measure refractive index, Abbe's refractometer was used. A drop of distilled water was placed on the prism with the adjustment of the drive knob till exactly at the centre boundary line intersects the separatrix. 1.3325 is the refractive index of distilled water at 25<sup>0</sup> C according to that the instrument was calibrated. By using 1 drop of the

*Tulasiswarasadi Taila*, refractive index was being determined at 25°C.

**Specific gravity** - An acetone and ether cleaned specific gravity bottle was taken, dried and weighed. At room temperature the specific gravity bottle was filled with *Tulasiswarasadi Taila* and the stopper was kept over it while removing the surplus liquid and it was weighed again. By replacing the *Tulasiswarasadi Taila* with distilled water, same procedure was repeated. The ratio between the weight of a given volume of *Tulasiswarasadi Taila* and the weight of an equal volume of distilled water is the specific gravity of *Tulasiswarasadi Taila* at the same temperature.

**Acid value** - In a conical flask, *Tulasiswarasadi Taila* (3.984 g) was added and shaken well with acid free alcohol-ether mixture (25ml+25ml) that was neutralised previously with the potassium hydroxide solution (0.1 M). Titration was done against Potassium hydroxide solution (0.1 M) after adding Phenolphthalein solution (1 ml). The reading of end point for the appearance of pink colour was noted (a).

Acid value =  $\frac{a \times 5.61 \times 0.1}{\text{Weight of sample in gram}}$

Weight of sample in gram

**Saponification value** - Into round bottom flask fitted with a reflux condenser, 2g of *Tulasiswarasadi Taila* was added with



25ml of alcoholic potassium hydroxide (0.5N) and refluxed for 1 hour on a water bath. It was then titrated after cooling it at room temperature with Hydrochloric acid (0.5 N) and by adding Phenolphthalein solution (1 ml), the end reading was noted down(a). The procedure was repeated by omitting the sample for blank reading (b).

Saponification value =

$$\frac{(b-a) \times 28.05 \times 1.000}{\text{Weight of sample in gram}}$$

Weight of sample in gram

**Iodine value** - In a dry iodine flask, the *Tulasiswarasadi Taila* was dissolved with CCl<sub>4</sub> (10ml) and iodine monochloride solution (20ml) and potassium iodide moistened stopper was inserted. At 17<sup>o</sup> C, for 30 min this flask was kept in a dark place. While using starch as an indicator, Titration was done with Sodium thiosulphate (0.1N) after adding potassium iodide (15ml) and water (100ml). The reading (a) was noted. In the same manner with the same quantities of reagents, the experiment was repeated omitting the substance and the reading (b) was noted.

$$\text{Iodine value} = \frac{(b-a) \times 12.69 \times 0.1}{\text{Weight of sample in gram}}$$

Weight of sample in gram

### HPTLC:

**Sample preparation for HPTLC** – 0.1 ml of sample was taken and diluted with 1 ml of hexane and used for chromatography. Thereafter prechromatographic derivetisation was done with alcoholic

KOH on plate itself. 5µl of the above sample was applied on a precoated silica gel 60 F254 on aluminium plates to a band width of 6 mm using CAMAG Linomat 5 TLC applicator. The plate was developed in petroleum ether: diethyl ether: acetic acid (9:1:0.1) volume/volume 60<sup>o</sup> C -80<sup>o</sup> C). The developed plate was derivatised by 5% H<sub>2</sub>SO<sub>4</sub> by dipping technique and heated till complete colour development and the developed plates were scanned under UV 254 and 366 nm. The record of R<sub>f</sub>, densitometric scan and colour of the spots were noted.

## RESULTS

### Organoleptic findings

*Tulasiswarasadi Taila* was having brownish yellow colour with aromatic oily odour. It was oily viscous in appearance, greasy in touch and bitter in taste (**Table 2**).

**Table 2** Organoleptic examination

Properties	<i>Tulasiswarasadi Taila</i>
Appearance	Oily Viscous
Colour	Brownish Yellow
Odour	Aromatic Oily
Touch	Greasy
Clarity	Clear
Taste	Bitter

### Pharmaceutical Evaluation

Physico-Chemical parameters of *Tulasiswarasadi Taila* like Loss on drying, Refractive index, Specific gravity, Saponification value, Acid value and Iodine value were assessed. Details are being given in Table 3.



**Table 3** Results of the drug analysis on Physico-chemical parameters

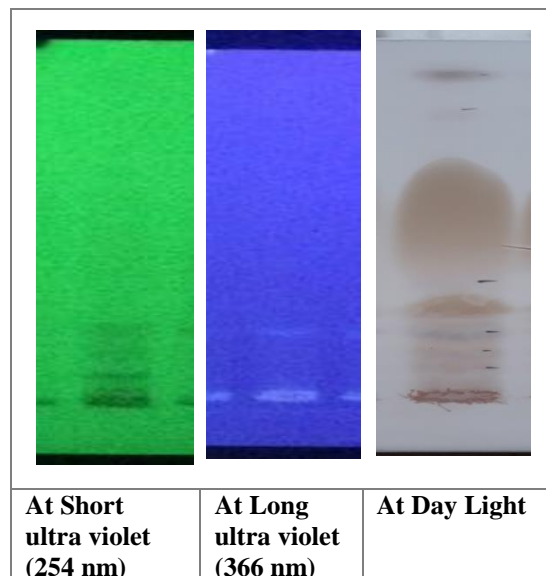
Parameter	<i>Tulasiswarasadi Taila</i>
Loss on drying	0.79%
Refractive index	1.52
Specific gravity	0.9219
Acid value	11.781
Saponification value	177.668
Iodine value	57.31

### High Performance Thin Layer Chromatography (HPTLC)

In HPTLC, in short UV-254 nm, maximum 13 spots were observed in *Tulasiswarasadi Taila*; while in long UV-366nm, maximum 3 spots were observed as given in **Table 4** and shown in **Figure 1** and **Figure 2**.

**Table 4** Chromatographic results of *Tulasiswarasadi Taila*

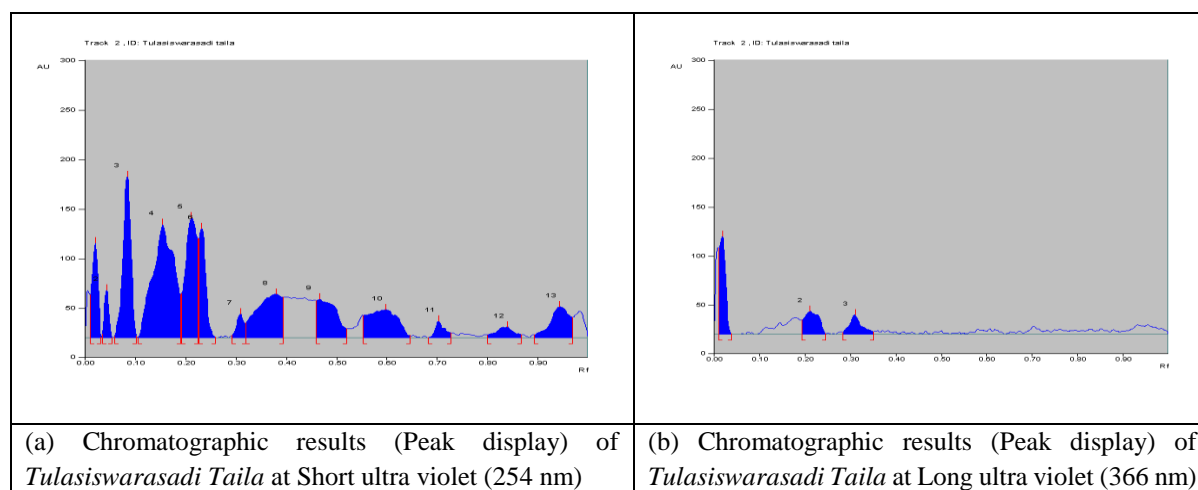
Conditions	R <sub>f</sub> values
Short ultra violet (254 nm)	0.02, 0.04, 0.08, 0.15, 0.21, 0.23, 0.31, 0.38, 0.47, 0.60, 0.70, 0.84, 0.94
Long ultra violet (366 nm)	0.02, 0.21, 0.31



**Fig 1** HPTLC photo documentation of Chloroform extract of *Tulasiswarasadi Taila*

## DISCUSSION

Loss on drying determines the amount of moisture, it was 0.79% for *Tulasiswarasadi*



**Fig 2** HPTLC evaluation of *Tulasiswarasadi Taila*

*Taila*. Refractive Index was found to be 1.52 for *Tulasiswarasadi Taila*, it indicates its density of liquid. Specific Gravity was found to be 0.9219 and it indicates its weight in comparison with that of distilled

water. The Acid Value for *Tulasiswarasadi Taila* was found to be 11.781, it indicates the presence of free fatty acids in the oil. In the present study, *Tulasiswarasadi- Taila* is having high Saponification Value



(177.668) indicative of faster rate of absorption<sup>6</sup>. In the present study, *Tulasiswarasadi Taila* is having 57.31 Iodine value that indicates of good possibility of atmospheric oxidation and absorption. These parameters can be set as standard values to derive quality constants for *Tulasiswarasadi Taila*. On Densitometric scan, The HPTLC unfold that at 254nm, 13 peaks with major peak at R<sub>f</sub> 0.15 contributing 23.19% area; at 366nm, 3 peaks with major peak at R<sub>f</sub> 0.02 contributing 52.46% area was noted.

The properties of *Tulasi* are *Katu* (pungent) *Tikta* (bitter), *Ruksha* (dry), *Ushna* (hot) and *Kapha Vata Shamaka*<sup>7</sup>, The properties of *Kundrushka* are *Madhura* (sweet), *Tikta* (bitter) *Katu* (pungent), *Tikshna* (strong), *Kapha Vata Shamaka*<sup>8</sup>, and The properties of *Tila Taila* are *Tikta* (bitter) *Kashaya* (astringent), *Ushna* (hot), *Guru* (heavy), *Sara* (movable), *Vyavayi* (spreading), *Vikasi* (opening channels), *Vata Kapha Shamaka* and *Lekhaniya* (scrapping)<sup>9</sup>.

The aqueous extract of *O. sanctum* L. significantly increases the anti-oxidant<sup>10</sup> activity, possess antibacterial activity<sup>11</sup>, increase neutrophil and lymphocyte counts with enhanced phagocytic activity and phagocytic index<sup>12</sup>, shows immunomodulatory effect<sup>13</sup>, anti-inflammatory activity<sup>14</sup>. The resinous part of *Boswellia serrata* possesses anti-

inflammatory activity<sup>15</sup>, anti-anaphylactic and mast cell stabilizing activity<sup>16</sup>, have effect on cell mediated components of the immune system<sup>17</sup>, shows anti-asthmatic activity<sup>18</sup>. The sesame seeds are used to treat dry cough, asthma, lung diseases and common cold<sup>19</sup>. Ogunsola O. K and Fasola T. R in 2014 reported use of the young leaves for respiratory diseases as medicine and the use of seed oil for soothing effect in chest complaints<sup>20</sup>.

So, the properties of *Tulasiswarasadi Taila* can be taken as *Katu* (pungent) *Tikta* (bitter) *Kashaya* (astringent), *Ushna* (hot), *Tikshana* (strong), *Vata Kapha Shamak* and it can be used in the imbalances of *Vata* and *Kapha* disorders. It has been indicated in *Pratishyaya*. Due to its *Ushna Tikshna* properties, it can be used as a *Shirovirechaniya* drug for removing *Kapha Avarana*, expelling vitiated *Doshas* from *Shira* and to remove *Srotoavarodha* (open the blockage) of channels. Its *Vyavayi* (spreading), *Vikasi* (opening channels) & *Sara* (movable) *Guna* may improve the availability of drugs. It may have anti-oxidant, antibacterial, immunomodulatory, anti-inflammatory, anti-anaphylactic, mast cell stabilizing, anti-asthmatic activity and may have effect on cell mediated components of the immune system. It can be used to treat dry cough, asthma, common cold and other respiratory diseases and may





show the soothing effect for chest complaints.

## CONCLUSION

*Tulasiswarasadi Taila* is said to be the best in treating *Vata and Kapha Vyadhi* such as *Nasadaurgandhya* and *Pratishyaya* and all the details pertaining to its ingredients are explained in *Sahasrayoga*. The Saponification Value and Iodine Value of *Tulasiswarasadi Taila* is found to be higher indicative of faster and better absorption justifying relevance of its indication in *Nasyakarma*. The result of the analytical study with HPTLC,  $R_f$  value and Densitometric Scan can be used as the standard quality control test if the same protocol is being followed to identify and check the quality as well as the *Paka* of *Tulasiswarasadi Taila* so that it can be used for various *Panchakarma* procedures as per the requirement.





## REFERENCES

1. Government of India, Ministry of Health And Family Welfare, Department of Indian Systems of Medicine And Homeopathy; The Ayurvedic Pharmacopoeia of India, Second Edition, 2003; Part I; 8 P. 359.
2. Sahasrayogam; Tailaprakarana; Hindi translation by Dr. Ramnivas Sharma and Dr. Surendra Sharma, Published by Chaukhambha Sanskrit Pratishtana, Delhi; 2016; P.88.
3. The Ayurvedic Formulary of India Part-1, Government of India, Ministry of Health & Family Welfare, Department of Indian Systems of Medicine & Homeopathy, New Delhi, 2nd revised English Edition, Published by the Controller of Publications, Civil lines, Delhi, 2003. Page No. 130 –131.
4. Department of AYUSH, Ministry of Health and Family Welfare, Government of India, the Ayurvedic Pharmacopoeia of India. 1st Edition, Part I, Volume VI, New Delhi, 2008; Page No. 290-298.
5. Sastri P, Sharangadhara Samhita with commentary, Madhyama Khanda Snehakalpanam 9/7,13, published by Choukhambha Orientalia Publication, Varanasi; 2002; p.124.
6. Vinaykumar K N et al; Pharmaceutico-analytical study of *Karpasasthyadi Taila* – A herbal oil used for *Nasyakarma* and *Greevabasti* International Ayurvedic Medical Journal; July, 2017; volume 5; issue 7; 2376-2390
7. Shri Bhavamishra, BhavaPrakash Part I Pushpa varga verse 62-63; with Vidyotini Hindi Commentary by Pt. Sri Brahmashankara Mishra Published by, Chaukhambha Sanskrita Bhavana, Varanasi; 2016; P.668
8. Shri Bhavamishra, BhavaPrakash Part I Karpuradi varga verse 50-51; with Vidyotini Hindi Commentary by Pt. Sri Brahmashankara Mishra Published by, Chaukhambha Sanskrita Bhavana, Varanasi; 2016; P.396
9. Shri Bhavamishra, BhavaPrakash Part I Taila varga verse 02-07; with Vidyotini Hindi Commentary by Pt. Sri Brahmashankara Mishra Published by, Chaukhambha Sanskrita Bhavana, Varanasi; 2016; P.927
10. Gupta S, Mediratta PK, Singh S, Sharma KK, Shukla R. Antidiabetic, antihypercholesterolaemic and antioxidant effect of *Ocimum sanctum* (Linn) seed oil. Indian J Exp Biol. 2006; 44:300–4. [[PubMed](#)]
11. Singh S, Malhotra M, Majumdar DK. Antibacterial activity of *Ocimum sanctum* L.fixed oil. Indian J Exp Biol. 2005;43:835–7. [[PubMed](#)]



12. Mukherjee R, Dash PK, Ram GC. Immunotherapeutic potential of *Ocimum sanctum* (L) in bovine subclinical mastitis. Res Vet Sci. 2005; 79:37–43. [[PubMed](#)]
13. Mediratta PK, Sharma KK, Singh S. Evaluation of immunomodulatory potential of *Ocimum sanctum* seed oil and its possible mechanism of action. J Ethnopharmacol. 2002; 80:15–20. [[PubMed](#)]
14. Kelm MA, Nair MG, Stasburg GM, DeWitt DL. Antioxidant and cyclooxygenase inhibitory phenolic compounds from *Ocimum sanctum* Linn. Phytomedicine. 2000;7:7–13. [[PubMed](#)]
15. Upaganlawar A, Ghule B. Pharmacological Activities of *Boswellia serrata* Roxb. - Mini Review. Ethnobotanical Leaflets [serial online] 2009[cited 2012, Aug 30]; 13:766-74.
16. Pungle P, Banavalikar M, Suthar A, Biyani M, Mengi S. Indian J Exp Biol 2003;41(12):1460-2.
17. Sharma ML, Kaul A, Khajuria A, Singh S, Singh G B. Immunomodulatory Activity of Boswellic Acids (Pentacyclic Triterpene Acids) from *Boswellia serrata*. Phytotherapy Research [serial online] March 1996 [cited 2012, Aug 30];10 (2):107-112.
18. Gupta V, Gupta A, Parihar S, Gupta R, Ludtke H, Safayhi, Ammon HP. Effect of *Boswellia serrata* gum Resin in Patient with Bronchial Asthma: Results of a Double Blind, Placebo Controlled 6 week Clinical Study. Eur J Med Res 1998; 3(11):511-4.
19. Patil GG, Mali PY, Bhadane VV. Folk remedies used against respiratory disorders in Jalgaon district, Maharashtra.
20. Ogunsola OK, Fasola TR. The antibacterial activities of *Sesamum indicum* Linn. leaf extracts. METHODS. 2014 Mar 28; 18.