



Original Article

Ingredients Identification and Physicochemical Analysis of *Vyaghri taila*

Amisha Patel^{1,*}, D B Vaghela², Prapti Jivrajani³, Harisha C R⁴, V J Shukla⁵

¹ PhD Scholar of Shalaky Tantra dept, IPGT & RA Jamnagar, India.

² Associate professor & HOD of Shalaky Tantra dept, IPGT & RA Jamnagar, India.

³ MD scholar of RSBK dept, IPGT & RA Jamnagar, India.

⁴ HOD of Pharmacognosy laboratory, IPGT & RA Jamnagar, India.

⁵ HOD of Pharmaceutical laboratory, IPGT & RA Jamnagar, India.

ARTICLE INFO

ABSTRACT

Received:10 Jun 2018

Accepted:22 Jun 2018

Background: *Vyaghri Taila* is a *Sneha Kalpana* indicated in *Nasa Roga* specially in *Putinasa*. It is used in *Nasya* therapy via nasal route. In present study it has been used for *Virechana Nasya* in *Dushta Pratishyaya* (Chronic Sinusitis). **Objective:** Present study is aimed to look out on raw drug authentication and standardization of pharmacognostical and physicochemical parameters. **Methods:** Drug identification and authentication was done by Pharmacognostical study i.e. morphological features, organoleptic characters and powder microscopy of drug. Physicochemical evaluation and HPTLC were carried out of prepared drug. **Results:** Pharmacognostical study of ingredients shows presence of acicular crystals, border pitted vessels, rosette crystals, tannin content, prismatic crystals, group of stone cells, starch with hilum, lignified parenchyma cells, oleoresin, etc. Pharmaceutical analysis shows specific gravity 0.91, loss on drying 0.54w/w, refractive index 1.48, acid value 7.55, iodine value 14.75, saponification value 81.04 and high performance thin layer chromatography at 254 and 600 nm resulted into 11 and 10 spots before and after spray respectively. **Conclusion:** Raw drug identification and authentication has been done and physicochemical evaluation has been carried out which is useful for standardization of *Vyaghri Taila*.

Keywords: *Dushta Pratishyaya*, Pharmacognosy, Pharmaceutical, *Vyaghri Taila* .

Corresponding author *

Dr Amisha Patel

PhD Scholar of Shalaky Tantra dept, IPGT & RA Jamnagar, India.

Email: amisha.patel1311@gmail.com

1. INTRODUCTION

Vyaghri Taila is a *Sneha Kalpana* indicated in *Nasa Roga* specially in *Putinasa* by *Chakradatta*¹ and *Bhaishajya Ratnavali*². *Dushta Pratishyaya* is a complicated condition due to improper management of *Pratishyaya*.³ *Dushta Pratishyaya* is almost similar to Chronic Sinusitis. Chronic Sinusitis is an inflammation of sinus which is persistent more than 12 weeks.⁴ Causes of Chronic sinusitis are deviated nasal septum, allergic rhinitis, respiratory tract

infection, gastro esophageal reflux, cystic fibrosis, etc.⁵ Any reason which block sinus ostia leads to impairment of mucus drainage and build up of mucus in sinuses. Long term inflammation leads to loss of cilia.⁶ Impairment of drainage and loss of cilia leads to pooling and stagnation of secretions. In this condition *Virechana Nasya* liquefy thick purulent discharge and removes it from sinuses. In present study *Vyaghri Taila* is used for *Virechana Nasya*. It is need of present era to make standard ayurvedic formulation without compromising its efficacy. WHO has framed a code for Good Manufacturing Practice in Ayurveda.⁷ So, present study is an attempt on this direction to make a standard parameters for an ayurvedic formulation. With this aim and objective pharmacognostical study of ingredients of *Vyaghri Taila* and physicochemical evaluation of *Vyaghri Taila* was carried out.

2. MATERIALS AND METHODS

Collection, identification and authentication of raw drugs

Vyaghri, *Vacha*, *Shunthi*, *Maricha*, *Pippali*, *Saindhava Lavana*, *Tila Taila* were procured from Pharmacy, Gujarat Ayurved University, Jamnagar, Gujarat, India. *Danti* and *Shigrubija* were procured from Dhanvantari drug house Junagadh. *Tulsi* was procured from botanical garden of Gujarat Ayurved University, Jamnagar. Ingredients of *Vyaghri Taila* and part used are given in Table No 1. The raw drugs were identified and authenticated by Pharmacognosy Laboratory, IPGT and RA, Gujarat Ayurved University, Jamnagar. Identification was done on basis of organoleptic characters (Table No 2), morphological features and powder microscopy of individual raw drugs as per API standards for authentication.

Table 1: Ingredients of *Vyaghri Taila*

Sr. No.	Drug Name	Botanical Name	Part used	Proportion
1	<i>Vyaghri</i>	<i>Solanum surratense</i>	Whole Plant	1/9 part
2	<i>Danti</i>	<i>Baliospermum montanum</i> Muel-Arg.	Root	1/9 part
3	<i>Vacha</i>	<i>Acorus calamus</i> Linn.	Rhizome	1/9 part
4	<i>Shigru</i>	<i>Moringa olifera</i> Linn.	Seeds	1/9 part
5	<i>Tulsi</i>	<i>Ocimum sanctum</i> Linn.	Leaves	1/9 part
6	<i>Sunthi</i>	<i>Zingiber officinalale</i> Roscoe	Rhizome	1/9 part
7	<i>Maricha</i>	<i>Piper nigrum</i> Linn.	Fruit	1/9 part
8	<i>Pippali</i>	<i>Piper longum</i> Linn.	Fruit	1/9 part
9	<i>Saindhava Lavana</i>	E-Rock salt.	----	1/9 part
10	<i>Tila Taila</i>	<i>Seasom indicum</i> L.	Seasom Oil	4 part
11	<i>Water</i>	H ₂ O	----	16 part

Preparation of Drug *Vyaghri Taila* in RSBK Department IPGT and RA

Preparation of *Yavakuta* (Course powder)

Vyaghri, *Danti*, *Vacha*, *Shigru*, *Shunthi*, *Maricha*, *Pippali* were taken and made it into course powder separately. *Tulsi* leaves was collected fresh, washed it and then paste of *Tulsi* leaves was prepared. After that *Tulsi* leaves, *Saindhava*

Lavana and *Yavakuta* of above drugs were taken and mix with each other to make a homogenous mixture in a paste form.

Preparation of *Vyaghri Taila*

This was carried out as per described classical method. *Tila Taila* was taken in vessel and was made it hot on law flame for *Murchhana*. After completion of *Murchhana*, temperature was raised to 70° C. At this moment *Kalka* is added with continuous stirring. Water was added to this with continuous stirring. After proper mixing of all ingredients, temperature is maintained between 65°C to 100°C, heating was carried out for two days, on second day after attaining *Mrudu Paka Taila Siddha Lakshanas*, final product of *Vyaghri Taila* was collected, filtered it thoroughly and stored it in sterile glass bottle.

Pharmacognostical study

Raw drugs were identified and authenticated by the Pharmacognosy department, IPGT & RA, Gujarat Ayurved University, Jamnagar. The identification were carried out on the basis of organoleptic features, morphological features and powder microscopy of drug.^{8,9}

Pharmaceutical evaluation

Physicochemical parameters

Vyaghri Taila was analyzed by using qualitative and quantitative parameters at Pharmaceutical Laboratory, IPGT & RA, Gujarat Ayurved University, Jamnagar. The common parameters mentioned for Oil in Ayurvedic Pharmacopia of India¹⁰ and CCRAS¹¹ guidelines i.e. Refractive index¹² iodine value¹³, acid value¹⁴, saponification value¹⁵ were taken. Presence of more moisture content in a sample can create preservation problem. Hence loss on drying was also selected as one of the parameters.

HPTLC:

Vyaghri Taila was dissolved in hexane. Sample application was done using CAMAG linomat 5. Pre chromatographic derivatization was carried out with Alc. KOH. HPTLC of *Vyaghri Taila* was carried out using the solvent system Pet ether : Diethyl ether : Acetic acid 9.0 : 1.0 : 0.1V/V ratio. HPTLC study was performed for the normal phase separation of components of *Vyaghri Taila*. Post chromatographic derivatization was done with vanillin sulphuric acid spray reagent.¹⁶

3. OBSERVATION AND RESULTS

Organoleptic characters: Organoleptic parameters like Taste, Colour, odour and nature were scientifically studied and results are as per depicted in Table 2.

Table 2: Organoleptic Characters of Ingredients

Sr. No.	Drug Name	Nature	Colour	Taste	Odour
1	<i>Vyaghri</i>	Course powder	Dull creamish brown	Astringent	Characteristic
2	<i>Danti</i>	Course powder	Creamish	Bitter astringent	Bitter
3	<i>Vacha</i>	Course powder	Dark Buff	Sweetish astringent	Sweetish

				tingling	
4	<i>Shigru</i>	Course powder	Dull yellow	Bitter oily	Bitter
5	<i>Tulsi</i>	Fresh leaf	Green	Bitter astringent	Aromatic
6	<i>Sunthi</i>	Course powder	Creamish	Astringent	Aromatic
7	<i>Maricha</i>	Course powder	Blackish	Pungent tingling	Spicy
8	<i>Pippali</i>	Course powder	Reddish Grey	Pungent	Characteristic
9	<i>Saindhava Lavana</i>	Course powder	Whitish	Salty	Characteristic
10	<i>Tila Taila</i>	Liquid	Yellowish brown	Astringent	Characteristic
Organoleptic characters of Prepared drug (<i>Vyaghri Taila</i>)					
Nature	Colour	Taste	Odor		
Liquid	Greenish black	Salty pungent	Mild bitter Characteristic		

Powder microscopy of Ingredients

Powder microscopy of each raw drug was done with course powder of dried samples by studying under the Carl Zeiss Trinocular Microscope before and after staining with Phluroglucinol and concentrated HCL to study the characters of the drug. The microphotographs were taken by a camera attached with the microscope as given below.

The powder microscopy of *Vyaghri* showed presence of Annular vessels, Simple trichome, Spiral vessels and Stellate trichome. (Figure 1-4) *Danti* showed Acicular crystals, Border pitted vessels, Group of fibers, Rosette crystals, Tannin content. (Figure 5-9) *Vacha* showed Annular vessels, Lignified scalariform vessels, Oleoresin content, Starch grains. (Figure 10-13) *Shigru* showed Cork in tangential view, Lignified parenchyma cells, Simple fiber, Stone cells, Tannin content. (Figure 14-18) *Tulsi* showed Glandular trichome, spiral vessels, Stomata and Warty trichome. (Figure 19-22) *Shunti* showed Oleoresin, Scalariform vessels, Simple starch grains. (Figure 23-25) *Maricha* showed Black debris, Brown content, Group of stone cells, Prismatic crystals. (Figure 26-29) *Pippali* showed Bottle neck shaped stone cells, Oil globules and starch with hilum. (Figure 30-32)

Physicochemical analysis:

Physicochemical analysis of *Vyaghri Taila* i.e. Acid value, Iodine value, Saponification value, Refractive index, Specific gravity, Loss on drying were scientifically studied and the results were detailed in Table 3.

Table 3: Physicochemical Parameters of *Vyaghri Taila*

Sr. No.	Analytical Parameters	Result
1	Acid value	7.55
2	Iodine value	14.75
3	Saponification value	81.04
4	Loss on drying	0.54 %w/w
5	Specific Gravity	0.91
6	Refractive index	1.48

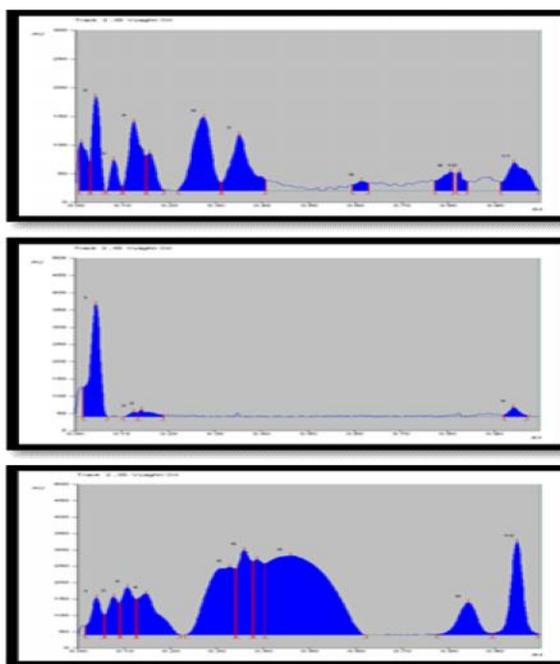
HPTLC Study:

Chromatographic study (HPTLC) was carried out under 254, 366 nm and 600 nm to establish fingerprinting profile. It

showed 11 spots at 254 nm , 4 spots at 366 nm before spray and 10 spots at 600 nm after spray. (Table No 4)

Table 4: Results of HPTLC of *Vyaghri Taila*

Before/After spray	Wavelengths	Spots	Rf Value
Before spray	254 nm	11	0.01, 0.04, 0.08, 0.12, 0.16, 0.27, 0.35, 0.61, 0.80, 0.82, 0.94
	366 nm	04	0.05, 0.13, 0.14, 0.94
After spray	600 nm	10	0.04, 0.08, 0.11, 0.15, 0.33, 0.36, 0.39, 0.46, 0.84, 0.95



Densitogram of *Vyaghri Taila* at 254 nm (Before spray) at 366 nm (Before spray) at 600 nm (After spray)

4. DISCUSSION

The initial purpose of the study was to confirm the authenticity of the drugs which are used to prepare *Vyaghri Taila*. For that purpose, Organoleptic evaluation was done of course powder of ingredients except *Tulsi* leaves which was collected fresh.

Authentication of used drugs was done by morphological and histological. This can prevent the accidental misuse of drugs and adulteration to a greater extent. In the present study *Vyaghri Taila* is a formulation which consists of nine herbal ingredients. The nine ingredients were proved to be genuine by assessing the Pharmacognostical parameters.

Evaluation of Physico-chemical parameters helps to assess the quality and identify the presence of specific ingredients in a formulation and application of chromatographic techniques which aid in recognition of number of ingredients

and also to assess the purity by comparing with the standard ones. Acid Value is more (i.e.7.55) which indicates that more number of free fatty acid present in this oil. Saponification value is a measure of the average molecular weight of all the fatty acids present in fat(i.e. oil). Law saponification value(i.e. 81.04) suggests that long chain fatty acid present in oil. ¹⁷ Law Iodine Value (i.e.14.75) suggests that *Vyaghri Taila* is very saturated, less number of C=C bond present in oil. ¹⁸ Refractive Index(i.e.1.48) is an important and quick parameter to assess quality of an oil as it is change according to its compounds. ¹⁹ Specific Gravity is vary according to density of liquid, so it is a quality parameter which is 0.91 of this oil. HPTLC is a chromatographic method which separate the ingredients of an ayurvedic formulation. So it is a best method to detect number of contains in a formulation. It also helps to detect the purity of sample. Results of HPTLC showed that 11 spots and 4 spots were detected at 254nm and 366nm respectively before spray and 10 spots were detected at 600nm after spray.

5. CONCLUSION

Vyaghri Taila is used for *Virechana Nasya*. The ingredients were identified and authenticated pharmacognostically and were used for preparation of *Vyaghri Taila*. The prepared drug i.e. *Vyaghri Taila* was evaluated by Pharmaceutical study. Standard operative procedure of Ayurvedic Pharmacopia of India is important during manufacturing of any Ayurvedic medicine to get optimum efficacy. Results of physico-chemical analysis are reference standards for evaluation of quality *Vyaghri Taila* and used as future reference for further research works

6. REFERENCES

1. Chakrapanidatta, Chakradatta, with Hindi commentary by Indradeva Tripathi, Chaukhambha Sanskrit series, Varansi. 3rd edition, 1997, Nasa Roga Adhikara, verse 5, pg-343.
2. Govind Das Sen, Bhaishajya Ratnavali, with Hindi Commentary by Prof. Siddhi Nandan Mishra, Varanasi, Chaukhambha Surbharti Prakashana, Reprint 2016, Nasa Roga Adhikara, verse 21, pg-406
3. Sushruta, Sushruta Samhita, with Hindi Commentry by Kaviraja Ambikadutta Shashtri, Varanasi, Chaukhambha Sanskrita Sansthan, Reprint 2014, Uttara Tantra, Pratishyaya Pratishedhiya verse 16, pg -155.
4. <https://en.m.wikipedia.org>, Dt-8/4/2018,5:30pm.
5. <https://www.myoclinic.org>,Dt-8/4/2018,4:57pm.
6. Dhingra P.L., Dhingra S. - Disease of Ear Nose & Throat & Head and Neck Surgery, 6thEdition, New Delhi; Elsevier; 2014.pg-195.
7. Anonymous, Guidelines of safety monitoring and pharmacovigilance on herbal medicine (World Health Organization Geneva); 2003.

8. Khandelwal KR, editor. Examination of powder drugs. In: Practical Pharmacognosy Techniques and Experiments. 19th ed. Pune: Nirali Prakashana; 2008. pg - 162-166.
9. The Ayurvedic Pharmacopoeia of India, Part II (Formulation), Volume I, First edition, Ministry of AYUSH, Government of India, New Delhi, 2007; Appendix-2, (2.1), Pg-136.
10. Protocol for testing of Ayurveda, Siddha & Unani medicines, Pharmacopoeial laboratory for Indian medicines, Ghaziabad, Ministry of AYUSH, Government of India.
11. Parameters for qualitative assessment of Ayurveda, Siddha drugs, CCRAS, New Delhi, 2005.
12. The Ayurvedic Pharmacopoeia of India, Part II (Formulation), Volume I, First edition, Ministry of AYUSH, Government of India, New Delhi, 2007; Appendix-3,(3.1),Pg-63.
13. The Ayurvedic Pharmacopoeia of India, Part II (Formulation), Volume I, First edition, Ministry of AYUSH, Government of India, New Delhi, 2007; Appendix-3,(3.11),Pg-74.
14. The Ayurvedic Pharmacopoeia of India, Part II (Formulation), Volume I, First edition, Ministry of AYUSH, Government of India, New Delhi, 2007; Appendix-3,(3.12),Pg- 75.
15. The Ayurvedic Pharmacopoeia of India, Part II (Formulation), Volume I, First edition, Ministry of AYUSH, Government of India, New Delhi, 2007; Appendix-3,(3.10),Pg- 73.
16. Mahesh Attimarad et al, High performance thin layer chromatography: A powerful analytical technique in pharmaceutical drug discovery, Pharm Methods. 2011;2(2):71-75.
17. <https://en.m.wikipedia.org>, accessed 27/4/2018,11:30pm.
18. <https://en.m.wikipedia.org>, accessed 27/4/2018,11:35pm.
19. <https://www.anton-paar.com>, accessed 27/4/2018, 11:52pm.

Conflict of Interest: None

Source of Funding: Nil