

Analytical Standardization and Evaluation of Ashwagandhadi Taila for its Suitability in Nasya Karma

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ABSTRACT

Background:

Sneha Kalpana occupies a significant position among the well-established pharmaceutical preparations of the Ayurvedic system of medicine. Taila Kalpana, in particular, is extensively described in classical texts and is widely employed in clinical practice for both internal and external therapeutic applications. Among the various Taila formulations, **Ashwagandhadi Taila**, described in Gadanigraha, holds special importance due to its specific indication in the management of **Vatavyadhi**. The formulation comprises drugs possessing Vata-shamaka, Balya, and Brimhana properties, making it therapeutically relevant in disorders dominated by Vata Dosha. In the present study, Ashwagandhadi Taila has been prepared strictly in accordance with the classical reference mentioned in Gadanigraha, following the prescribed Sneha Kalpana principles. Further, an analytical evaluation of the prepared Taila was carried out to assess its physicochemical characteristics, with the aim of establishing standard parameters and ensuring quality and reproducibility of the formulation.

Sneha Kalpana is a classical Ayurvedic pharmaceutical preparation widely used in clinical practice.

Ashwagandhadi Taila is indicated in Vatavyadhi and is suitable for Nasya Karma.

Objective: To evaluate physicochemical parameters of Ashwagandhadi Taila for standardization.

Materials and Methods: The formulation was prepared as per classical reference with proportional reduction.

Physicochemical parameters were analyzed as per API guidelines.

Results: The oil showed acceptable values for acid value (1.78), peroxide value (1.44), iodine value (87.63), and saponification value (221.54).

Conclusion: The formulation meets standard quality parameters and is suitable for Nasya Karma. Further studies are recommended.

Keywords: Ashwagandhadi Taila, Nasya Karma, Sneha Kalpana, Physicochemical analysis

I. INTRODUCTION

Sneha Kalpana represents a distinctive Ayurvedic dosage form characterized by its oleaginous base and wide therapeutic applicability. These preparations are versatile, as they can be administered through both internal and external routes. The formulation typically consists of three essential components: Sneha (lipid media rich in fatty acid glycerides), Kalka (herbal paste containing concentrated bioactive phytoconstituents), and Drava (liquid medium), which serves as a primary source of hydroxyl groups and facilitates the transfer and solubilization of active principles into the lipid base, thereby potentiating the overall therapeutic efficacy.¹

Sneha Kalpana is a well-recognized and time-tested pharmaceutical preparation in the Ayurvedic system of medicine. The key benefit of these oleaginous formulations lies in their ability to efficiently extract and incorporate both lipid-soluble and water-soluble active constituents derived from herbal and mineral sources.²

Sneha Kalpana is an important dosage form in Ayurveda, consisting of Sneha, Kalka, and Drava. These formulations enable extraction of active principles. Nasya Karma involves administration through nasal route, which acts on Urdhvajatrugata disorders.³

Ashwagandhadi Taila described in Gadanigraha possesses Vata-shamaka and Balya properties. Analytical standardization is essential for ensuring quality and reproducibility.⁴

Aim and Objective

Aim: To standardize Ashwagandhadi Taila.

Objective: To evaluate physicochemical parameters.

II. MATERIALS AND METHODS

Pharmaceutical study

Collection of drugs -The raw drugs Ashwagandha, Tagar, Shatapushpa, Musta, Vyagrahnakhi,

Twacham, Madhukam, Shringavera, Prishnaparni, Bala, Rasna, Pushkarmoola, Bhootikam, Punarnava, Manjistha, Nalanda, Patram, Dravanti, Surasa, Vacha, Swadamstra, Mrinaal, Bahuputrikam, palardhadrugs was procured from pharmacy, Mumbai and Tila Taila was purchased from oil pressing mill moodubidire, Karnataka.

Authentication of drugs

The authentication was done in the department of Dravya guna Alvas Ayurveda Medical college and hospital, Moodubidire.

Preparation of Ashwagandhaditaila

Raw drugs were procured and authenticated. The formulation was prepared as per classical method with proportionate reduction. The final product was analyzed as per Ayurvedic Pharmacopeia of India standards.

No	Drug	Part Used	Botanical Name	Quantity
1	Ashwagandha	Moola (root)	WithniaSomnifera	3200gm
2	Tagar	Root	Valerian Wallichii	12gm
3	Shatapushpa	Seed	Anethum Graveolens	12gm
4	Musta	Rhizome	Cyperus Rotundus	12gm
5	Vyagrahnakhi	Root bark	Capparis Zeylenica	12gm
6	Twacham	Stem bark	Cinnamomun Verim	12gm
7	Madhukam	Bark	Glycyrrhiza Globra	12gm
8	Shringavera	Rhizome	Zinziber Officinalis	12gm
9	Prishnaparni	Root	Uraria Picta	12gm
10	Bala	Root	Sida Cardifolia	12gm
11	Rasna	Rhizome	Pluchea Lanceolata	12gm
12	Pushkarmoola	Root,	Inularacemosa Hook	12gm
13	Bhootikam	Leaves	CymbopoganCitratuPoaceae	12gm
14	Punarnava	Root and leave	BoerhaviaDiffusaa	12gm
15	Manjistha	Root	Rubia Cardifolia	12gm
16	Nalanda	roots	Nardostochys Jatamansi	12gm
17	Dravanti	Seed, roots	Balosperrum Montanum	12gm
18	Surasa	Leaves	Ocimum Sanctumi	12gm
19	Vacha	Rhizome	Acorus Calamus	12gm
20	Swadamstra	Fruit with seed	TribullusTerresteris	12gm
21	Mrinaal	Stem	Nelumbium	12gm
22	Bahuputrikam	Seed	Asparagus Sarmentosus	12gm
23	Guduchi	Stem	Tinosporacardifolia	12gm
24	Sthiram	Root	DesmodiumGangeticum	12gm
25	Patram	Leaf	Cinnamomum Tamala	12gm

Method of Preparation5

Preparation of the Ashwagandhadi Taila was done as mentioned in shloka,

वातव्याधावश्वगन्धाचतैलम् -

मूलानामश्वगन्धायाःशतंस्यात्खण्डशःकृतम्।द्विद्रोणेऽ

पांपचेत्स्वाथमष्टभागावशेषितम्॥१८५॥

तैलाढकंसमावाप्यक्षीरंदद्याच्चतुर्गुणम्।समालोड्यपचेद

तत्कल्कांश्चैषांसमावपेत्॥१८६॥

Ashwagandhamoola 100 Pala, Water 2 Dronareduce to 1/8th part, Taila- 1Adhaka (3000ml) Ksheera 4 Adhaka (12000ml) for Kashaya 2.5liters water.

Here 1.5 Liters of Taila prepared

Ashwagandha Moola pounded To get Ashwagandha moola kwathachurna

Quantity taken is =2400gm,12000ml Water Added & reduced to 1/8= 1500ml

Tila Taila-1500ml

Ksheera-6000ml

Kalka Dravya Each taken 11gm.

was added slowly to it, followed by adding 250g of kalka (paste) of drugs. Mild heat was given throughout the procedure. Stirring was done continuously with the help of spatula. After the observation of Sneha Siddhi Lakshana (confirmatory tests for oil), the Taila (oil) was filtered through a clean cloth, the obtained Taila

(oil) was measured and preserved in wide mouthed glass container

III. OBSERVATIONS AND RESULTS

During the preparation of Taila by the classical Sneha Kalpana method, distinct physical and organoleptic changes were observed at each stage of the process. Initially, the mixture of Kalka (herbal paste), Drava Dravya (Ksheera), and Sneha Dravya (oil) appeared heterogeneous with visible separation of contents.

On continuous heating over **madhyamaagni**, gradual evaporation of aqueous content was noted, accompanied by uniform mixing of Kalka with the oil. The color of the Taila progressively changed, indicating effective extraction of lipid-soluble phytoconstituents from the herbal drugs. Mild frothing was observed during intermediate stages, which gradually reduced as moisture content decreased.

Characteristic **Sneha Siddhi Lakṣaṇas** were observed, Separation of kalkawas noted, able to role the varti of kalka, frothing started with creamy layer, when Agni Pariksha was done, no crackling sound noted, more froth was seen at the end of tailapaka6 (phenodgamataila), later the taila was immediately filtered through a clean cloth measured and preserved in wide mouthed glass container

In Madhyama Paka stage, the Kalka is devoid of water and is soft to touch, it can be rolled into wick when rubbed between two fingers. It is indicated for both internal as well as external application. Charaka Samhita as well as Astanga Hridaya7 had advised it for Basti and Pana. Sushruta40 had indicated it for Nasya and Abhyanga8 where asSharangadhara and BhaishajyaRatnavalli had mentioned it for Sarva Karma.9

Madhyama Paka Taila is considered ideal for Nasya Karma, as it possesses appropriate viscosity, smoothness, and penetrative capacity (Sukṣma&VyavayiGuṇa), enabling effective absorption through the nasal mucosa. Its optimal Sneha and Ushṇa properties facilitate Vata samana, particularly in disorders of the UrdhvaJatruPradesa.

The final Taila exhibited smooth texture, uniform color, and clarity without sedimentation, confirming attainment of Madhyama Paka, which is considered ideal for therapeutic use. No signs of charring or burning were observed, indicating proper temperature regulation throughout the process.

Results

Parameter	Result
Acid value	1.78
Viscosity	46.71
Rancidity	Not rancid
Specific Gravity	0.914
Iodine Value	87.63
Saponification Value	221.54
Peroxide Value	1.44
Refractive Index	1.467
Unsaponifiable Matter	1.97%

IV. DISCUSSION

The present discussion evaluates the therapeutic suitability of **Ashwagandhadi Taila** for Nasya based on its **physico-chemical analytical profile**.

The **acid value (1.78)**: Acid value indicates the measure of the amount of carboxylic acid groups in a chemical compound, such as free fatty acids. It indicates the age of the sample and how much free acid present in it, higher the acid value more will be its degree of rancidity. Free fatty acids are responsible for the rancidity of the compound. Ashwagandhadi Taila indicates minimal free fatty acid content, suggesting good oil stability and negligible hydrolytic rancidity. Low acid value is essential for Nasya dravya, as nasal mucosa is highly sensitive and oils with higher acidity may cause irritation or mucosal damage. Hence, the observed value supports the **safety of intranasal administration**. The Acid Value of the Taila is 1.78.

Viscosity:- Viscosity indicates the flow property of a material; less viscous material flows faster than more viscous material. Viscosity of a mixture differs with temperature and it increases under high pressure. If the viscosity of the oil is increased the rate of absorption decreases, which means if oil is less viscous the rate of absorption is very high. The Taila has viscosity (kgm-1 s-1) of about 46.71 % w/w. The **viscosity value of 46.71 cSt** suggests moderate thickness, which is ideal for Nasya, ensuring adequate mucosal coating without excessive obstruction of nasal passages. This property aids in sustained contact with the nasal epithelium, facilitating better drug penetration towards the Shiras and cervical structures, thereby helping relieve stiffness and pain in Manyasthambha.

Rancidity :-Any Sneha either oil or ghee whether it is medicated or crude is very much sensitive to the moisture. When they come in contact with moisture there is a higher chance of

hydrolysis and consequently development of microbes increase. Atmospheric oxygen may cause oxidative degeneration of the product, whereas the increased concentration of gases like CO₂, CO, S etc may cause harmful effect to it. The chemical decomposition caused by hydrolysis or oxidation of fats, ghee and other lipids causes foul smell and discolouration of oil/ghee is called as rancidity. When fat is decomposed to fatty acids and glycerol then free fatty acids undergo further auto oxidation. This oxidation primarily occurs with unsaturated fats by free radical mediated process. These chemical processes can generate highly reactive molecules in rancid oil/ghee, which are responsible to producing unpleasant and noxious odours and flavours.

The oil was found to be **non-rancid**, supported by a **low peroxide value (1.44)**. Peroxide value reflects the extent of primary oxidation of lipids; lower values indicate better oxidative stability. Non-rancid nature is particularly important in Nasya, as oxidized oils may lead to local irritation or headache. Thus, Ashwagandhadi Taila demonstrates good storage stability and therapeutic acceptability.

Iodine value indicates the degree of unsaturation in fatty acid present in oil/ghee preparation. Higher the iodine value, higher will be the degree of un-saturation and lower iodine value indicates the higher degree of saturation in fatty acids. Higher iodine value of oil makes it more reactive, less stable and more susceptible to oxidation and rancidification. Oils will have higher iodine value in comparison to ghee.

The **iodine value (87.63)** suggests a moderate degree of unsaturation, which enhances skin and mucosal permeability. Oils with moderate unsaturation are known to improve trans-mucosal absorption of lipid-soluble phytoconstituents. This property may facilitate the delivery of bioactive compounds of Ashwagandha and other ingredients to deeper neural and musculoskeletal tissues, contributing to Vata-samana and muscle relaxation.

Saponification value indicates the degree of alkalinity of the sample. Higher the saponification value higher will be its alkalinity. It refers to the number of esters that can be hydrolysed and turned to soap. It is helpful in determining adulteration of given fat by one of the lower or higher saponification value. A **saponification value of 221.54** indicates the presence of a higher proportion of low molecular weight fatty acids. Such oils are known for better emulsification and absorption, supporting rapid

therapeutic action when administered through Nasya. This parameter further validates the suitability of Ashwagandhadi Taila for procedures requiring quick systemic and neurological action.

The Refractive index is used to measure the concentration of solute present in the oil medium. It is used to confirm the purity of the substance or to measure its concentration. Thereby it indicated the potency as well as its suitability of the medicines for intended therapeutic purpose. The refractive index of Visarpahara Taila was 1.45232 %w/w

The **specific gravity (0.914)** and **refractive index (1.467)** were within acceptable limits, confirming the purity and consistency of the formulation. These parameters indicate absence of adulteration and uniform physicochemical behavior, ensuring reproducibility and reliability of therapeutic outcomes.

The **unsaponifiable matter (1.97%)** is of particular importance, as this fraction contains sterols, phytoconstituents, and lipid-soluble bioactives responsible for anti-inflammatory, neuroprotective, and rejuvenative effects. These constituents may play a key role in reducing cervical muscle spasm, inflammation, and nerve irritation observed in Manyasthambha.

Overall, the analytical findings substantiate that Ashwagandhadi Taila possesses **optimal stability, safety, absorption potential, and therapeutic suitability for Nasya karma**. Its physicochemical profile supports classical claims of Vata-hara, Bṛṃhaṇa, and Balya actions, making it an effective intervention in the management of Manyasthambha.

V. CONCLUSION

The study establishes analytical standards and confirms the suitability of Ashwagandhadi Taila for Nasya Karma. Further microbiological and clinical studies are recommended.

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