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Ayurveda

PHARMACEUTICAL ANALYTICAL STUDY OF GUNJADYA TAILA –AN AYURVEDIC FORMULATION

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ABSTRACT **Introduction:** Gunjadya Tailais Ayurvedic Formulation which is used mainly in the management of Kushthaand Vatvedana. Gunjadya Taila contain drugs like Gunjabeeja, Bhhringaraj Patra Swaras and Tila Taila. These drugs are very potent individually and possess Vedhana Sthapak, and Kushthagna property. In Ayurveda there are various formulations of these drugs mention in different Text. Gunjadya Taila is one of the formulation which is mentioned in Rasatarangini. The standardization of Gunjadya Taila is not mentioned in Ayurvedic Pharmacopoeia of India; hence in this study, an attempt has been made to establish pharmaceutical standardization of Gunjadya Taila. **Materials and Methods:** Pharmaceutical standardization of Gunjadya Taila prepared as per reference of Rasatarangini and Gunjadya Taila was formulated as referred such as refractive index, specific gravity, saponification value, acid value, iodine value. PH value Loss on drying, Ash valiue, Rancidity, HPTLC. **Conclusion:** Gunjadya Taila can be prepared by heating and maintaining average temperature up to 97°C. Mild heating and constant stirring areneeded for medicated oil preparations possessing desired attributes.

KEYWORDS : pharmaceutical, standardization, GunjadyaTaila, Ayurveda, Kushtha

INTRODUCTION

The science of Ayurveda is an ocean of knowledge that addresses basic principal of life.[1] Ayurveda is highly developed qualified life and health science system based on its unique and fundamental concepts. Ayurveda has gained importance today life in the field of diseases. Prevention and cure is gaining worldwide popularity of its effectiveness for the same. Medicine are the backbone of every medical science and all medical field have their own specific dosage forms.[2] Bhaishjya Kalpana is the branch of Ayurveda related with preparation of various herbal dosage forms such as Swaaras(juice), Kalka (Paste), Kwatha (Decoction),Hima, Fanta as main dosage form and Asavarishta, Avaleha Churna, Medicated Ghrita oil as sub dosage forms. Bhaishajya Kalpana preparation of medicated Taila and Ghrita has been dealt under the heading of Sneha Kalpana. Sneha kalpa are generally prepared by subjecting heat to oil or Ghrita with prescribe of Kalka, Kwath and other liquid media fulfil certain pharmaceutical parameter according to need of therapeutics.

Sneha Kalpana is composed of two word Sneha and Kalpana Root Word is Sniha Preetau which means smoothness, oiliness etc. Kalpa"Krupsamarthye" kalpyate vidhiyate asavvidhihi means to generate power in any desire matter. Kalpanais the processe though which planned grouping formulation and processing of herbs into medicinal form by using some row material according to physical requirement. Sneha Kalpana can be defined as a pharmaceutical process to prepare oleaginous medicine by subjecting unique heating pattern and duration to oil or ghee with prescribed quantity of Kalka Kwatha and other Drava Dravya to fulfil certain pharmaceutical parameter according to need of therapeutics .[3]Gunjadya Taila is mentioned in Rasatarangini in the form of oil and indicated in Kushtha Previously no study has been conducted on Gunjadya Taila regarding its standardization and analytical study hence in this study, an attempt has been made to establish pharmaceutical standardization of Gunjadya Taila.

Aims & Objective

1. To do the Shodhana of Gunjabeeja in Godugdha
2. To carry out Tila Taila Murchchhana
3. To Prepare Gunjadya Taila with Murchchhita Tila Taila
4. To assess the quality control parameters of Gunjadya Taila

MATERIALAND METHODS

The study was divided into following parts

- Collection of Raw materials
- Purification of Gunjabeeja in Godugdh.
- MurchchhanaofTilaTaila
- Preparation of GunjadyaTaila
- Analytical Study of GunjadyaTaila

Collection of Raw Materials

All raw materials required for preparation of GunjadyaTaila were procured fromDattatraya Ayurveda Rasashala of the institute. Identification was done by the department of Dravyaguna and authentication was done by Foundation for Revitalisation of Local Health Traditions (FRLHT)Bangalore.

Pharmaceutical Study

Three batches of GunjadyaTailawere prepared from Murchhita Tila Taila to establish pharmaceutical standardization. The preparation process was alienated into the following three steps.

i. Purification (Shodhan) of Gunjabeeja

Gunjabeejshodhan was done as described in Rasatarangini (4).GunjabeejPottali(bolus)were made and dipped in an earthen vessel containing cow milk. Then earthen vessel was kept on gas stove and heated for 3 hrs at 80°C throughout the experiment. Total, 6.5 liters cow milk was used for one batch throughout the process. After boiling for 3 hrs, the Pottaliwas kept for cooling. After cooling Pottaliwas opened andGunjabeeja werewashed with lukewarm water and kept all seeds to dry in shade. In this way, all three batches of Gunjabeejashodhana were done. The seeds were preserved in airtight container.

Table no 1 -GunjabeejaShodhanaas Described in Rasatarangini

S.N.	Gunjabeej	Yantra	Godugdha	Duration
1	200 gms	Dolayantra	6.5 liters	3 hours
2	200 gms	Dolayantra	6.5liters	3 hours
3	200 gms	Dolayantra	6.5 liters	3 hours

a. Raw *Gunjaseeds* b. *GunjaShodhana* in *Dolayantra* c. *Shodhita Gunjabeej* D.*Gunjabeej* after washing with hot water

Figure 1: Images of Gunjabeeja Shodhana

ii. Murchchhana of Tila Taila[5]

Table No 2-The Ingredients Required for Murchchhana of Tila Taila

S.N.	Name of ingredients	Latin Name	Part use	Quantity
1	Manjishta	Rubiacordifolia Linn	Root	68.75 gm
2	Haridra	Curcuma longa.Linn	Rhizome	25 gm

3	Lodhra	Symplocosracemosus Roxb	Stem bark	25gm
4	Nagarmotha	CyperusrotundusLinn.	Tuber (Kanda)	25gm
5	Ratanjyot	Alkannatinctoria (L.) Tausch	Root	25gm
6	Amalaki	Emblicaofficinalis. Gaertn	Pericarp	25gm
7	Haritaki	TerminaliachebulaRetz	Pericarp	25gm
8	Bibhitaki	TerminaliabelliricaRoxb	Pericarp	25gm
9	Kevada	Pandanusodoratissimus Linn	Root	25gm
10	Netravala	Pavoniaodorata Linn	Root	25gm
11	Vatankur	FicusbengalensisLinn	Leaf bud	25gm
12	TilaTaila	Sesamumindicum Linn	Oil	1100 ml
13	Jala	Water		4400 ml

Process: Tila Taila (1100 ml) was taken in a steel vessel and heated on mild fire toremove moisture and it was allowed for cooling. Bolus of Kalka (Paste) of all ingredients of Table no-2 was prepared by adding little water, which was added to oil and was continuously stirred forhomogenous mixing. Then, 16 parts of potable water (4400 ml) were added to the vesseland heated over low flame with continuous stirring. After confirming all the Siddhi Lakshanas (tests of completion), the heating was discontinued and the oil was filtered through double-folded muslin cloth in the warm condition itself. The filtered Murchchhita Tila Taila was filled in an airtight glass bottle and stored.This Murchchhita Tila Taila was used for preparation Gunjadya Taila.

a. *Kalka of Murchchhana drugs* b. Mixing with *Tila Taila* c. *Tail Paka* d. *Murchchhit Tila Taila*

Figure 2: Images of Tila Taila Murchchhana

iii. Preparation of Gunjadya Taila

Gunjadya Taila was prepared as per reference from Rasatarangini [6]. The study samples were prepared in the Laboratories of the department of Rasashastra and Bhaishajya Kalpana. Ingredients required for preparation of Gunjadya Taila are mentioned in Table no 3.

Table No 3-Ingredients of Gunjadya Taila

S.N.	Name of ingredients	Latin name	Quantity
1	ShuddhaGunjabeejKalk	AbrusprecatoriousLinn	50gm
2	TilaTaila	Sesamumindicum Linn	200ml
3	BhringarajPatraSwaras	Eclipta alba	800ml

Procedure

1. First purified Gunja seeds were converted into Kalka by pounding in khalvayantra with adding of little quantity of water.
2. 200ml Murchchhita Tila Taila was taken in a steel vessel. To this Gunja beej kalka with weight of 50gm was added.
3. Finally 800 ml Bhringaraj Patra Swarasa was added to it.
4. All mixture was kept on slow fire till Snehasiddhi Lakshana appeared.
5. Then oil was filtered with double layered muslin cotton cloth.
6. Finally prepared GunjadyaTaila Preserved in Airtight glass bottle.
7. Following the same procedure, the Gunjadya Tail was prepared in 3 batches.

Analytical Study

The analytical evaluation was done to establish the preliminary standards for Gunjadya Taila as there are no pharmacopeia standard guidelines. The formulation was first tasted for organoleptic parameters such as odour, colour, appearance and consistency (Table 5) Physicochemical analysis includes specific gravity, refractive index, acid value, saponification value, unsaponifiable matter, iodine value, and peroxide value (Table no. 6) Analysis was conducted at analytical lab of Mahatma Gandhi Ayurved Collage hospital and Research center, Salod (H)Wardha, Maharashtra

OBSERVATION & RESULTS

To authenticate pharmaceutical standardization, three batches of Gunjadya Taila were prepared from Murchchhita Tila Taila. Pharmaceutical observation of Gunjadya Taila are mentioned in Table no 4.

Table No 4: Pharmaceutical Observation of Murchchhita Gunjadya Taila

S.N.	Observational parameters	Batch A	Batch B	Batch C
1.	Quntity of Kalka	50 gm	50 gm	50 gm
2.	Quantity of MurchchhitaTilaTaila	200 ml	200 ml	200 ml
3.	Quntity of BhringarajPatraSwarasa	800 ml	800 ml	800 ml
4.	Average temp of oil during addition of Kalka	900C	900C	900C
5.	Average temp of oil during addition of Swarasa	880C	880C	880C
6.	Duration of Heating	2 hours	1 hour 55 min	2 hours
7.	Total quantity of GunjadyaTaila Obtained	170 ml	160 ml	160 ml
8.	Weight loss	30ml	40ml	40ml
9.	% of weight loss	15%	20%	20 %
10.	Temperature during filtration of oil	600C	600C	600C

Table No 5: Pharmaceutical Observation of Amurchchhita Gunjadya Taila

S.N.	Observational parameters	Batch A	Batch B	Batch C
1.	Quntity of Kalka	50 gm	50 gm	50 gm
2.	Quantity ofTilaTaila	200 ml	200 ml	200 ml
3.	Quntity of BhringarajPatraSwarasa	800 ml	800 ml	800 ml
4.	Average temp of oil during addition of Kalka	900C	900C	900C
5.	Average temp of oil during the addition of Swarasa	880C	880C	880C
6.	Duration of Heating	2 hours	2 hours	1hour50 min
7.	Total quantity of GunjadyaTaila Obtained	170 ml	165 ml	165 ml
8.	Weight loss	30ml	35ml	40ml
9.	% of weight loss	15%	17.5%	20%
10.	Temperature during filtration of oil	600C	600C	600C

a. *Gunja Beej Kalka* b.*Bhringraja Juice* c. *Tail paka Murchchhita Tila Taila* d. *Gunjadya Tail* (MGT)

Figure 3: Images of pharmaceutical preparation of Murchchhita Gunjadya Taila

a. *Gunja Beej Kalka* B.*Bhringraja Juice* c. *Taila paka Ammurchchhita Tila Taila* d. *Gunjadya Tail (AGT)*

Figure 3: Images of a pharmaceutical preparation of Amurchchhita Gunjadya Taila

Analytical Study

a) Organoleptic Characters[7]-Gunjadya Taila was tested for odor, colour, appearance, and consistency results are summarized in Table No 5.

Table No 6- Organoleptic Characters of Murchchhita Gunjadya Taila

S. N.	Organoleptic Characters	Observations Batch A	Batch B	Batch C
1	Colour	Reddish Brown	Reddish Brown	Reddish Brown
2	Odour	Characteristic	Characteristic	Characteristic
3	Appearance	Viscous	Viscous	Viscous
4	Consistency	Oily	Oily	Oily

Table No 7- Organoleptic Characters of Amurchchhita Gunjadya Taila

S. N.	Organoleptic Characters	Observations		
		Batch A	Batch B	Batch C
1	Colour	Yellowish Green	Yellowish Green	Yellowish Green
2	Odour	Characteristic	Characteristic	Characteristic
3	Appearance	Viscous	Viscous	Viscous
4	Consistency	Oily	Oily	Oily

Table no 8- Organoleptic Character of Tila Taila, Murchchhita Tila Taila

Sr No	Parameter	TilaTaila	MurchchhitaTilaTaila
1	Colour	Dark yellow Red	Dark yellow Red
2	Odour	sesame oil	The mixed flavor of oil sesame oil and Cyprus rotundas
3	Appearance	Translucent Reduced translucent	Translucent Reduced translucent
4	Consistency	Oily	Oily

b. Physicochemical parameters such as saponification value. Determination of loss on drying, Specificgravity, Ash Value PH value, Rancidity Refractive index, Acid value, and Iodine Value were done by DattatrayRasashala of the institute and the result are mentioned in Table No 6

Table No 9-Average Physicochemical parameters of Gunjadya Taila[8]

S.N.	Physicochemical Parameters	MGT	AGT
1	Determination of saponification Value	196.35	190.30
2	Determination on loss of drying	1%	1%
3	Specific gravity	0.998	0.912
4	Ash Value	0.26%	0.20%
5	PH value	8.57	6.70
6	Rancidity	Absent	Absent
7	Acid value	8.412	7.293
8	Refractive Index	1.473	1.462
9	Iodine value	3.72	4.99

MGT-Murchchhit Gunjadya Taila AGT-Amurchchhit Gunjadya Taila

HPTLC

High performance thin Layer Chromatography (HPTLC) is sophisticated analytical technique which is used to separate constituents present in the formulation.[9] In the HPTLC documentation, on it is observed that 6 spots occurred at 254nm and at 7 sopt observed in MGT at 366nm. HPTLC was done in SICART Gujarat.

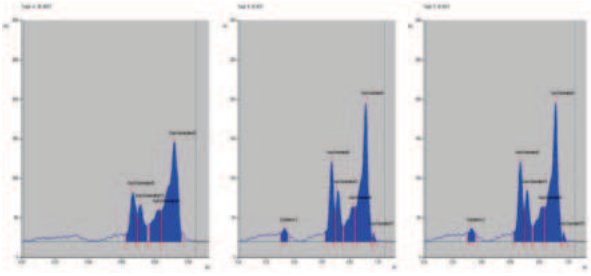


Figure 4-HPTLC Finger Printing of Gunjadya Taila at 254 nm Showing Peaks

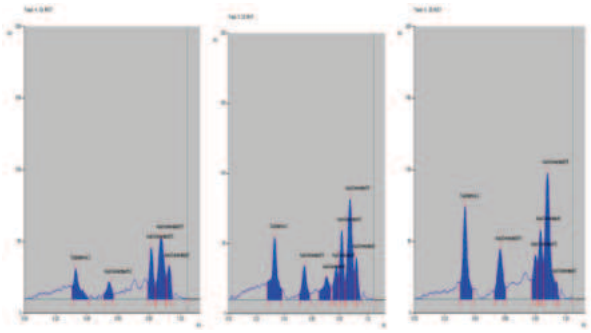
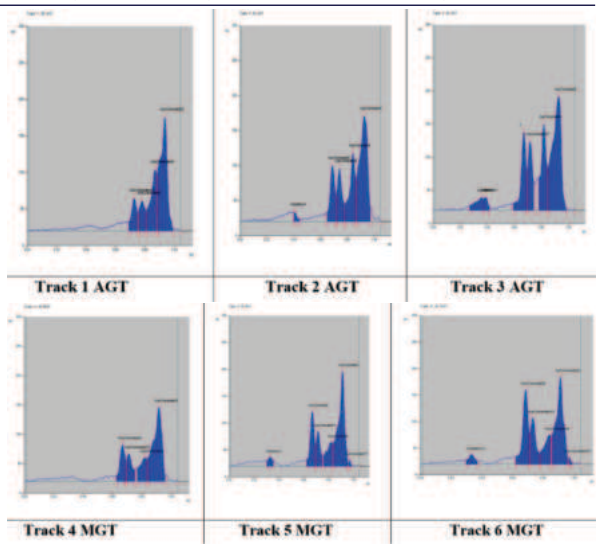


Figure 5-HPTLC Finger Printing of Gunjadya Taila at 366nm Showing Peaks



DISCUSSION

Taila Murchchhana is a preliminary treatment for the fixed oils (Tila Taila, ErandaTaila, Katu Taila, etc.) using a few certain medicinal plants that are supposed to be able to get rid of unpleasant odours, impart great colour like Aruna Varna, and have fragrance. In order to prevent any negative effects of Taila that can interact with Sneha and reduce therapeutic efficiency, the Murchchhana procedure is essential and must be followed carefully.Tila Taila Murchchhana was carried out as part of Sneha Kalpana as per mentioned in

Bhaishajya Ratnavali. After the Murchchhana of Taila was subjected to preparation of Gunjadya Taila. The herbal medication used in Murchchhana may function as an antioxidant, improving the chemical stability of oils. Since the Murchchhanadrugs themselves have significant therapeutic value, it may be concluded that this will ultimately help the medicated oil to be more therapeutically effective than oil prepared without Murchchhana (10)

In the current environment of globalization desire for greater therapeutic efficacy, the Murchchhana procedure is extremely important. However, every preparation of medicinal oil must precisely contain the Murchchhana procedure as a precondition. Three batches of Gunjadya Taila has been prepared with intention to establish SOP. In GunjadyaTaila preparation Total Three Drugs were taken as mentioned in Table no. 3. 1 Shuddha Gunjabeej Kalka 2. Murchchhita Tila Taila 3. Bhringaraj Patra Swaras. For preparation of Gunjabeej Kalka first Gunja Shodhana was done in Godugdha. After being processed, the roots, seeds, and leaves of the Gunja plant (Abrus precatorius Linn, Family: Fabaceae) have traditionally been utilised for their emetic, tonic, aphrodisiac, purgative, and hair growth-promoting effects. [11-12] It has been used for criminal purposes to poison both humans and cattle since ancient times, and even as arrow poison, fish poison, and much more. [13] Abrus seeds have abortive properties due to the presence of a poisonous lectin termed abrin (an albumotoxin), a fat-splitting enzyme known urease, aglucoside actually named abrussic acid, trigonelline, choline, and steroidal oil. [14-16] Boiling the seed is said to make it harmless, and abrin has a lethal dose of 0.1–g/kg in humans. [17-18] Murchchhita TilaTaila was subjected to heat at mild fire. Kalka was added in bolus form in Murchchhita Tila Taila at that time temp of oil was 90^0c.Froth appear when Kalka was added into oil no change in colour was observed but final colour of the prepared sample was slightly darker. In the present study, 2 hours were required to complete Sneha Pak. During the Pak maximum temp of oil observed were 85^0to90^0in the initial stage and 90 to 97^0 in the final stage of Pak. The temp of oilat the time of filtration was 60^0. (Table no 3) Gunjadya Taila is used for local applications as per Sharangdhara. Madhyam Pak is used for all Karma so Gunjadya Taila was heated up to the Maddhyam Paka[19].Most of the Gunja formulations are advised in oil form[20].

The final product of Gunjadya Taila has the colourred probably due to the Reddish colour of MurchchhitaTilaTaila and the greenish colour of Bhringaraja Swarasa. Odour is characteristic and is brought on by the inclusion of specific medicinal herbs to the Tila Taila.(Table no . 4)According to analytical finding, rancidity was absent in both samples. Refractive index, which refers to sample density in relation to

air and liquid media, was 1.473 for Murchchhita Gunjadya Taila and for Amurchchhita Gunjadya Taila 1.462. The specific gravity of Murchchhita Gunjadya Taila was more than AGT i.e. 0.998. Gunjadya Taila shows the characteristic presence of solute contents. Free fatty acids are still developing, making them vulnerable to the creation of brand-new compounds in an effort to become stabilized, as evidenced by variations in the saponification value following Sneha Paka. The number of COH groups in oil will determine how much alkali is required to saponify it. The number of free fatty acids in a sample, as well as the average molecular weight and chain length of all the fatty acids present, is represented by the saponification value. Shorter chain fatty acids have a high saponification value while longer chain fatty acids have a low saponification value. Longer chain fatty acids take longer to be absorbed than shorter chain fatty acids, with Murchchhita Gunjadya Taila having a saponification value of 196.3. The rancidity of compounds is induced by free fatty acids, which are present in oil and are represented by the acid value; the higher the free fatty acid, the more rancidity is found. The acid value for MGT is 8.412 and for AGT is7.293, which will aid in evaluating the oil's shelf life. The degree of oil unsaturation is reflected by the iodine value; the higher the degree, the higher the chance of absorption and air oxidation. Unsaturated fatty acids are better absorbed than saturated fatty acids; the value was determined to be 3.72 for MGT and for AGT 4.99 (Table no. 5). The higher the iodine number, the more unsaturated fatty acid interactions are present. At 254 nm and 366 nm, respectively the HPTLC revealed six and seven significant spots, indicating that the matrix may include chemicals with potential therapeutic action.

CONCLUSION

Gunjadya Taila is prepared after purification of Abrus precarious seeds and performing Tila Taila Murchchhana.The parameters assessed of the Gunjadya Taila revealed a significant increase in saponification value, specific gravity, and refractive index, while a decrease in iodine value and peroxide value indicates that MGT is more stable and has a longer shelf life than AGT. Considering all of the data collected, it has been demonstrated that the Murchchhana process is extremely important for improving therapeutic efficacy. As a result, the Murchchhana process must be strictly used as a precondition in the preparation of any medicated oil.

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