PHARMACOGNOSTICAL AND PHARMACEUTICAL EVALUATION OF *BRIHAT SAINDHAVADI TAILA* IN THE MANAGEMENT OF *AMAVATA* W.S.R. TO RHEUMATOID ARTHRITIS

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Abstract

Introduction: *Amavata* (Rheumatoid Arthritis) has been a challenging problem to the medical field. From the modern point of view, this disease looks similar to Rheumatoid arthritis. The *Brihat Saindhavadi Taila* is cited in the ancient books of *Ayurveda* used for the treatment of *Amavata*(Rheumatoid arthritis).

Materials and methods : In the present study *Brihat Saindhavadi Taila* sample was selected for evaluation of Total Ash value acid, refractive index, iodine value, saponification, loss on drying , P^H, acid value, HPTLC.

Results: Refractive index 1.4900, specific gravity 0.976, P^H 5.68, Saponification value 22.79, iodine value 22.28, acid value 5.58, and HPTLC result reveals presence of active compound.

Conclusion: The present study provides updated information on its pharmacological properties and probable mode of action of *Brihat Saindhavadi Taila,* which will help worldwide acceptance of the formulation and standing of the *Ayurveda* system. It is also helpful for the future research concerning establishment of safety profile and therapeutic efficacy of *Taila* formulations.

Key words: *Amavata, Brihat Saindhavadi Taila,* HPTLC, Pharmaceutics, Pharmacognosy.

Introduction:

Rheumatoid arthritisis one of the challenging joint diseases encountered by physicians in day-to-day practice due to its chronicity, progressive nature, complications, and morbidity. According to *Ayurveda*it is correlated with *Amavata.* According to *Madhav Nidana, Ama* carried by vitiated *Vata* which travels throughout the body and accumulates in the joints and enters into the *Trika* (pelvic girdle) and *Sandhi* (joints) leading to stiffness (*Stabdhata*) of the body, hence *Amavata* occur[1]. *Acharya Madhava* has described causative factors for *Amavata* as *Viruddhahara* (unwholesome diet), *Viruddhachesta* (erroneous habits), *Mandagni*, sedentary lifestyle, and exercising immediately after food[2].

The term "*Amavata*" is derived from two words - "*Ama*" and "*Vata*" where the word *Ama* means improper or partially or immature digested matter. Principal of treatment on *Amavata* in *Chakradatta* is very simple. *Langhana, Svedana, Tikta Rasadravya, Deepaniyadravya, Katu Rasadravyas, Virechana Karma, Snehapana* and administration of *Basti* are prescribed in the treatment of *Amavata. Brihat Saindhavadi Anuvasana Basti* followed by *Kshara Basti* is also recommended in *Amavata*[3]. Looking into the above fact, it can be said that the drug having *Amapachana, Deepana, Vatahar, Shothahara, Vedanahara* properties can be the choice of drugs for the management of Rheumatoid Arthritis . *Brihat Saindhavadi Taila* is a unique preparation explained *in Amavata Chikitsa* of *Chakradatta* and *Bhavamishra* which contains *Saindhava Lavana, Sauvarcala Lavana, Vid Lavana, Svarjika Kshara, Haritaki, Bibhitaki, Amalaki, Rasna, Pippali, Gaja pippali, Maricha, Kustha, Sunthi, Yavani, Pushkarmool, Jiraka, Mulethi, Satapushpa* are having property of *Vata Kapha Shamaka, Agnideepana, Bhedana, Amasodhana, Srotovisodhana, Sothahara,* and *Angamarda,* digestive, hepato-protective and laxative, So the *Brihat Saindhavadi Taila* have the potent pharmacological action on the *Amavata* (RA), the effect of the drug can be further justified on analyzing the result of clinical trial. *Vata* has the properties like *Ruksha, Laghu, Sheeta, Sukshma, Chala, Vishada, Khara* etc. *Brihat Saindhavadi Taila* is indicated in the condition of *Sula, Anaha* and *Amavata*, in *Chakradatta.*

In the present study, the formulation is subjected to pharmacognostical and pharmaceutical analysis to standardize the finished product *Brihat Saindhavadi Taila* were verified and all the ingredients were proved to be authentic.

MATERIALS AND METHODS

Drug Material

Raw drug material was collected from the pharmacy of Gujarat Ayurved University and local market of Jamnagar.

Table: 1. These are the ingredients and part used of ***Brihat Saindhavadi Taila[4,5,6] :***

Sr. no	Sanskrit name	Botanical name	Parts used	Quantity
1.	*Saindhava Lavana*	*Rock salt*	Salt	24 gm
2.	*Triphala*	*(Amalaki)Emblica officinalis* Gaertn. *(Bibhitak)Terminalia bellirica* Roxb. *(Haritaki)Terminalia chebula* Retz	Fruit	24 gm
3.	*Rasna*	*Pluchea lanceolata* Oliver & Hiren	Root	24 gm
4.	*Pippali*	*Piper longum* Linn	Fruit	24 gm
5.	*Gajapippali*	*Scindapsus officinalis* Schott	Fruit	24 gm
6.	*Sarjika*	*Swarjika Kshara*	Kshara	24 gm
7.	*Maricha*	*Piper nigrum* Linn.	Fruit	24 gm

8.	*Kushta*	*Saussurea lappa*, C. B. Clarke	Root	24 gm
9.	*Shunti*	*Zingiber officinalis* Roscoe	Rhizome	24 gm
10.	*Sauvarchala*	*Sochal salt*	Salt	24 gm
11.	*Vida*	*Vida salt*	Salt	24 gm
12.	*Ajamoda*	*Apium graveolens*, Linn	Fruit	24 gm
13.	*Yavani*	*Trachyspermum ammi*, Linn	Fruit	24 gm
14.	*Pushkara*	*Inula racemosa* Hook. f.	Root	24 gm
15.	*Jiraka*	*Cuminum cyminum* Linn	Fruit	24 gm
16.	*Madhuka*	*Glycyrrhiza glabra*, Linn	Root	24 gm
17.	*Shatapushpa*	*Anethum sowa* Kurz	Fruit	24 gm
18.	*Erandataila*	*Ricinus communis* Linn	Oil	768 gm
19.	*Shatapupsha Kvatha*	*Anethum sowa* Kurz	Seed water	768 gm
20.	*Kanji*	*Fermented gruel*	Liquid	1572 gm
21.	*Mastu*	*Curd water*	Curds	1572 gm

Methods of preparation of *Brihat Saindhavadi Taila*

Take all ingredients according to pharmacopoeial quality. Prepare *Murchhita Eranda Taila*. One day before the *Sneha Paka*, initiate to prepare *Mastu*. Clean and dry the 19 ingredient of the Formulation Composition. Prepared decoction and filter through muslin cloth to obtain *Kwatha.* Prepare homogeneous blend (*Kalka*). Take *Murchhita Eranda Taila* in a stainless steel vessel and heat it. Add increments of *Kalka,* stir thoroughly while adding *Kwatha.* Continue stirring, maintaining the temperature. After that add *Mastu* and *Kanji* and continue the process of heating intermittently over a period of days and constantly check the *Kalka* by rolling between the fingers.Continue the process on mild heating till the observation of *Snehapaka Siddhi Lakshana* appeared.

Pharmacognostical study

Raw drugs were recognised and authenticated by the Pharmacognosy laboratory, IPGT & RA., Jamnagar. The identification was carried out based on the morphological structures, organoleptic features and powder microscopy of the individual drug. Later, pharmacognostical evaluation of the raw drugs was carried out. Raw drugs were liquefying in small quantity of distilled water, filtered through filter paper and studied under the microscope attached with camera, with stain and without stain. Microphotographs were taken by using Carl Zeiss binocular microscope attached with camera[7].

Microscopic study

The fine powder of ***Brihat Saindhavadi Taila*** was taken then examined under microscopic without staining for the observation of characters of cellular materials, then stained with phloroglucinal and conc.

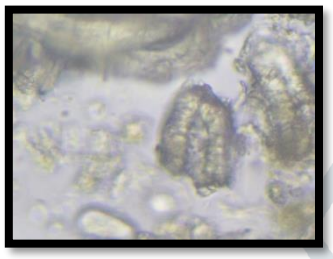
HCl[8] for the lignified characters. Raw drugs were separately studied under microscope; the microphotographs of diagnostic characters were taken by using Carl zeiss trinocular microscope[9]

(Fig 1-18) Microphotographs of *BrihatSaindhavadiTaila*

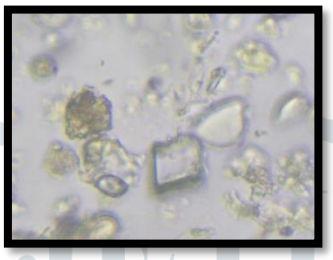
1. Brihat saindhavadi taila powder

2. Scleroid of Haritaki

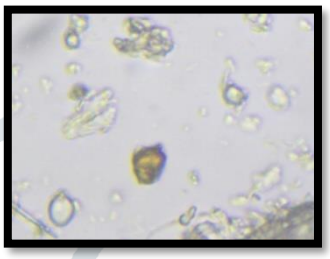
3. Stone cell of Bibitaki



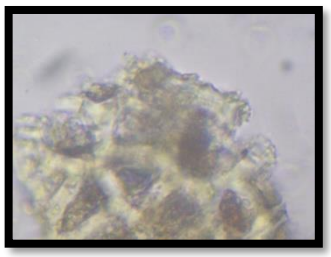
4. Stone cells of Pippali



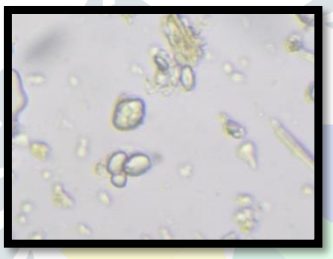
5. Prismatic crystal of Yastimadhu



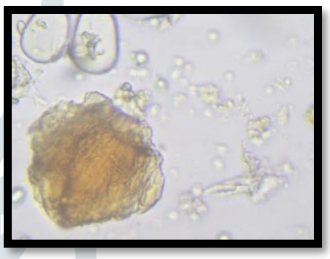
6. Oil globule of Ajmoda



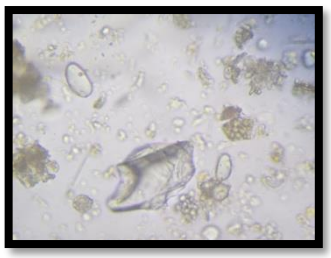
7. Epicarp cells of Jeerak



8. Starch grains of Pushkarmool

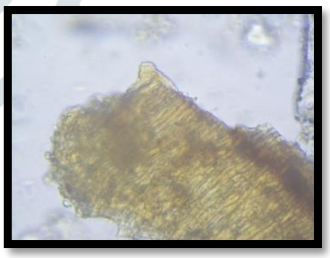


9. Tannin contant of Kusta



10. Silica deposition of Amalaki

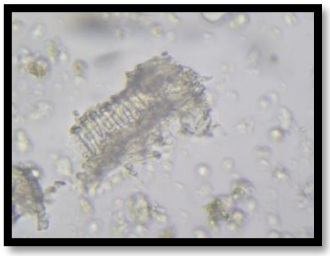
11. Trichome of Bibitaki



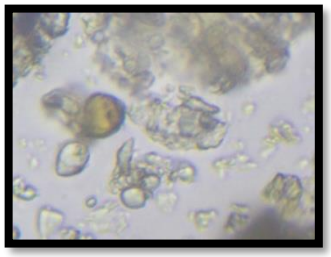
12. Epidermal cells of Ajvan

13. Scleroids of Pushkaramoola

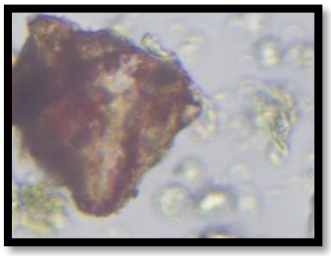
14. Stone cells of Maricha



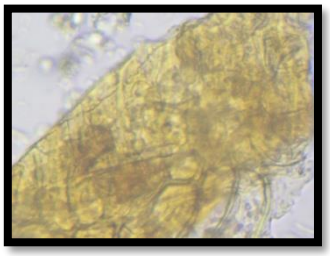
15. Annular vessels of shunti



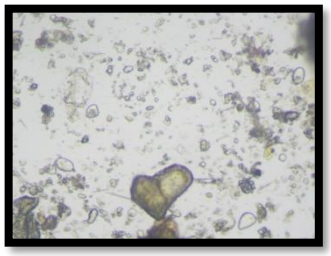
16. Oil globules of Jeerak



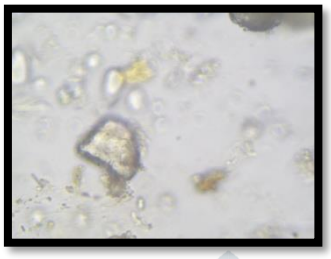
17. Reddish debbries of Suvarchana lavan



18. Epidermal cells of Ajmooda

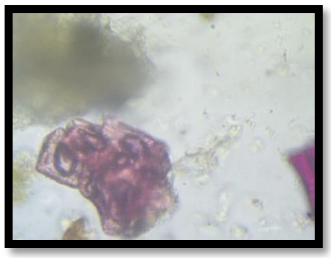


19. Vittae cells of Jeerak



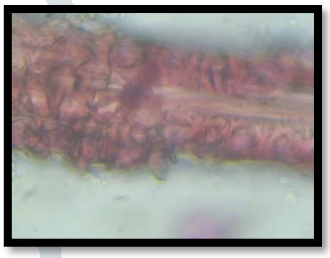
20. Prismatic crystal of Gajapippali

21. Lignified scleroids of Haritaki

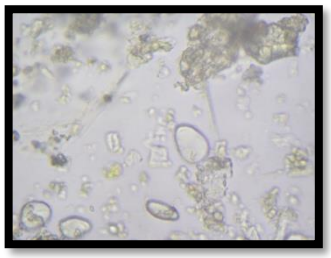


22. Lignified stone cells of Maricha

23. Annular vessels of Kustha



24. Lignified crysta fibres of Yastimadhu

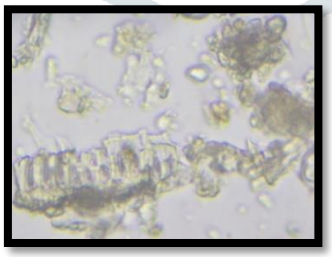


25. Starch grains of Shunti

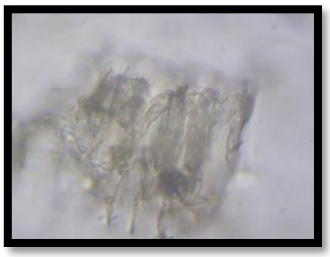
26. Fibres of Gajapippali

27. Scleroids of Pushkarmoola

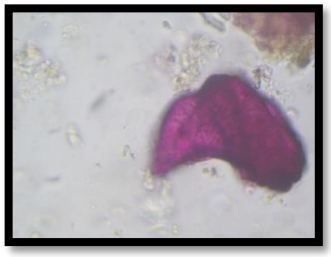
28. Fibres of Yastimadhu



29. Pitted vessels of Rasna

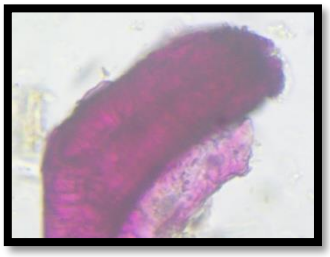


30. Cork cells of Kustha



31. Lignified stone cells of Pippali

32. Stone cells of Yastimadhu



33. Stone cells of Bibitaki

OBSERVATION AND RESULTS

Organoleptic evaluation

Organoleptic characters are very important and give the general idea regarding the gentility of the sample. It is done with the help of *Panchagyanendriya Pariksha /* sense organs. Various parameters such as colour, odour, taste and touch of the raw drugs were observed and recorded[10,11] and shows as below in (Table - 3).

Table no.2 Organoleptic evaluation of *Brihat Saindhavadi Taila*

No.	Organoleptic parameters	Results
1	Colour	Pale greenish yellow
2	Odour	Slightly aromatic
3	Taste	Salty, sweeties insist
4	Touch	Fine coarse

Physicochemical evaluation

Brihat Saindhavadi Taila was analysed by using standard qualitative and quantitative parameters, HPTLC was carried out after making suitable solvent system with methanolic extract of *Brihat Saindhavadi Taila* at the pharmaceutical chemistry lab, IPGT & RA. Gujarat Ayurved university, Jamnagar[12].

High performance thin layer chromatography (HPTLC)

HPTLC was performed as per the guideline provided by API. Methanolic extract of drug sample was used for the spotting. HPTLC was performed using Toluene + Ethylacetate (9:1) solvent system and observed under visible light. After development, Densitometry scanning was performed with a CAMAG TLC scanner III in reflectance absorbance mode at 254nm and 366 nm under control of Win CATS software[13,14].

Physico-chemical analysis of *Brihat Saindhavadi Taila* showed on Table 4 Maximum Rf of *Brihat Saindhavadi Taila* in HPTLC showed in Table 3. Fig. 33 and 34 showed 12 prominent spots at 254nm 3D; Fig. 35 and 36 showed 07 prominent spots at peak display of 366 nm 3D of *Brihat Saindhavadi Taila.*

Table: 3. R_f value of *Brihat Saindhavadi Taila*

Chromatogram shows 12 prominent spots at **254nm** with maximum R_f value		Chromatogram shows 07 prominent spots at **366nm** with maximum R_f value	
No. of Spots 12	**6.38**	**No. of Spots 13**	**18.73**
	3.71		**9.77**
	1.85		**18.56**
	3.46		**6.57**
	5.12		**12.99**
	6.00		**33.38**
	8.47		**8.47**
	5.34		
	14.34		
	21.56		
	23.78		
	25.4		

Figure No. 33 – 34 Densitogram curve of Methanol extract of *Brihat Saindhavadi Taila* at 254nm

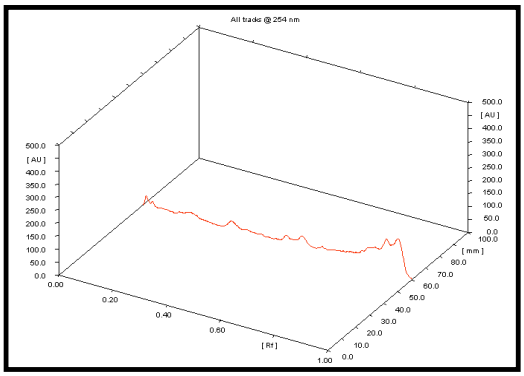


Figure No. 33

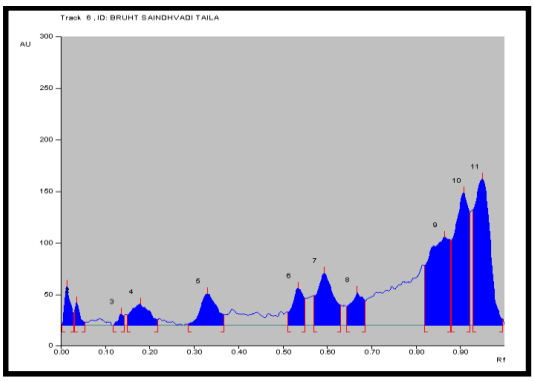


Figure No. 34

Figure No.35 – 36 Densitogram curve of Methanol extract of *Brihat Saindhavadi Taila* 366 nm

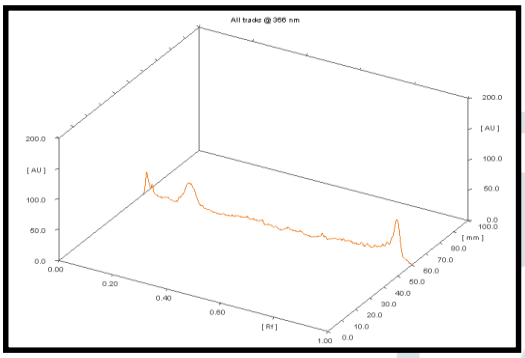


Figure No. 35

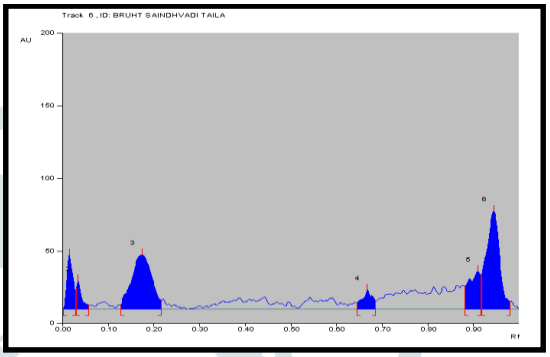


Figure No. 36

Table No. 4. Results of physico-analytical study of ***Brihat Saindhavadi Taila***[15].

No.	Parameters/ Sample	*Brihat Saindhavadi Taila*
1.	Refractive Index	1.4900
2.	Specific Gravity	0.9766 at room temp.
3.	Acid Value	5.58
4.	Saponification	22.79
5.	Iodine value	22.28

DISCUSSION

Organoleptic evaluation was performed for coarse powder of *Brihat Saindhavadi Taila*. *Brihat Saindhavadi Taila* was authenticated and analysed before processing because good quality products mainly dependent upon genuine raw materials. The colour of *Brihat Saindhavadi Taila Churna* is Pale greenish yellow due to the presence of content like *Triphala, Yastimadhu* etc. The odour is slightly aromatic like. Taste is Salty, sweeties insist because of maximum contains are *Lavana* and having *Madhura Rasa* and *Vipaka* also. Pharmacognostical study reveals authentification of *Brihat Saindhavadi Taila* was cross verified with standard reference API. The Starch grains, stone cells, oil globule, Scleroids, trichomes, Epidermal cells, Annular vessels, Reddish debbries, Prismatic crystal, fibers, Epicarp cells, Tannin contant, Silica deposition, Lignified scleroids, crysta fibres and stone cell, Cork cells, Vittae cells and Pitted vessels are observed under the microscope which were used as ingredients. All the physico- analytical study i.e. Refractive index 1.4900, specific gravity 0.976, PH 5.68, Saponification value 22.79, iodine value 22.28, acid value 5.58, and HPTLC result reveals presence of active compound. HPTLC profile of the methanolic extract of the drug showed 12 spots at 254 nm and 07 spots at 366 nm.

It is multiherbo-mineral oil which contains fourteen important herbs, the main ingredients are *Saindhava Lavana, Sauvarcala Lavana, Vid Lavana, Svarjika Kshara, Haritaki, Bibhitaki, Amalaki, Rasna, Pippali, Gajapippali, Maricha, Kustha, Sunthi, Yavani, Pushkarmool, Jiraka, Mulethi, Satapushpa*. The majority of drugs are *Lavana, Katu* and *Tikta Rasatmaka. Lavana* and *Katu Rasa* is *Vatakapha Shamak* and *Tikta Rasa* is *Pittakapha Shamaka. Katu Rasa* is *Agnideepak* and *Amapachaka* in nature. Hence combination of these drugs having specially *Lavana* and *Katu Tikta Rasa* are useful in *Amavata*. *Saindhava Lavana* is *Tridosashamak, Rochana, Deepana, Vrushya, Chakshushya, Avidahi, Hrudya, Kaphavilayana, Kapha Chedana, Vibandhaghna* in properties. In *Brihat Saindhavadi Taila* 82% drugs are having *Ushna Veerya*. Thus *Sweda-avarodh, Anaha, Shotha, Vibandha* is pacified by *UshnaVeerya. Rasna* is having *Vatashamak, Amapachaka, Vedanashamak, Shothagna* properties and *Pippali* is having *Vatakaphashamaka, Deepana, Rasayan, Rechan* properties. The base of oil is *Eranda Taila* having *Vatakaphahara, Deepana, Bhedana, Krimighna, Amasodhana, Srotovisodhana, Sothahara, Vrushya, Sukrasodhana, Kusthaghna Angamarda Prasamana* properties.

CONCLUSION

Pharmacognostical study outcomes approve that all characters were found in ingredient drug of *Brihat Saindhavadi Taila*. The physicochemical analysis is inferred that the formulation meets maximum qualitative standards and all the parameters discussed here may be used as identifying tools for the quality assessment of *Brihat Saindhavadi Taila*. Thus, outcome of the study may be taken as standard references, groundwork and fundamentals for the present study, additional for the further studies.

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