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Ingredients Identification and Pharmaceutical Analysis of *Brihat Jeevakadya Taila* - A Compound Ayurvedic Formulation

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ABSTRACT

'Migraine' comes from the Greek word, hemicranias, which means pain affecting one side of the head (classical Migraine) may affect the entire head. In Ayurveda *Ardhavabhedaka* there is severe headache in half portion of the head either left or right. So we can correlate *Ardhavabhedaka* with Migraine. Migraine *(Ardhavabhedaka)* is one of the most disabling of neurological disorders. The World Health Organization (WHO) has identified migraine among the world's top 20 leading causes of disability. A clinical study was conducted on this problem with *Brihat Jeevakadya Taila* (BJT). It was inferred from the results that it was promising result effect in the treatment of Migraine. Till date there is no data regarding evaluation of BJT. It was aimed to develop the pharmacognostical and phytochemical profile of BJT. The samples were subjected to organoleptic, physicochemical analysis and High Performance Thin Layer Chromatography (HPTLC) examination by optimizing the solvent systems. The pharmacognostical study of ingredients of BJT shows the presence of Prismatic crystal, Stellate trichome, Oil globule, Border Pitted vessels etc. Pharmaceutical analysis showed that the loss on drying value was 0.1493% w/w, Specific gravity 0.9197, Refractive index 1.4780, Iodine value 72.21 and High Performance Thin Layer Chromatography at 254 nm and 366 nm resulted into 8 & 7 spots respectively. These parameters of pharmacognosy and pharmaceutical analysis can become the baseline for future.

Keywords: *Brihat Jeevakadya Taila,* HPTLC, Pharmacognosy, Physicochemical.

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INTRODUCTION

A Migraine is a neurovascular headache; occurs due to changes in the vascular body system and also affects the muscular tissues too. The World Health Organization (WHO) has identified migraine among the world's top 20 leading causes of disability[1]. The main characteristics of migraine headaches are severe pain on either one side or both sides of the head, extreme sensitivity to light and sound, nausea, vomiting and an abdominal upset. In modern science number of medicines like anti inflammatory, analgesic, NSAIDS etc. have been tried in the management of Migraine but final answer to its management is yet awaited. Moreover routine use of these drugs leads to GI tract disturbance. 'Migraine' comes from the Greek word, hemicranias, which means pain affecting one side of the head (classical Migraine) in episodic nature may affect the entire head too. *Ardhavabhedaka* in Ayurveda classics is a similar type of severe headache in half portion of the head either left or right with episodic onset [2]. The clinical picture of *Ardhavabhedaka* (Migraine) is a *Vata-Pitta* dominating in presentation. In *Shiro-Roga* concept of *Ayurveda*, a lot of medicines with systemic treatment protocol are indicated for *Ardhavabhedaka* (Migraine) which need to be tried clinically, and these recipes are free from above mentioned GIT complications and rather safe in long term use. A *Brihat Jeevakadya Taila* (BJT) formulation has been mentioned in *Chakradatta Shiro Roga Adhikara* [3] with its specific use for *Vata-Pitta Shirahshoola*. This preparation containing seven drugs namely *Vidarikanda* (*Pueraria tuberosa DC), Draksha* (*Vitis Vinifera* Linn.), *Yashtimadhu* (*Glycyrrhiza glabra* Linn.*), Madhooka* (*Madhuca indica), Bala* (*Sida cordifolia* Linn.), *Nilotpala* (*Nymphaea nouchali* Burm*), Chandan* (*Santalum album* Linn.), and other contents are *Sharkara*, *Tila-Taila, Godugdha*, and Meatsoupe. No any work has been carried out regarding the pharmacognostical and pharmaceutical standardization of this compound formulation. Lack of standardization of polyherbal formulations creates difficulty in validating the efficacy and maintaining quality standards of the product. Therefore, proper identification of raw materials at the basic level with the help of microscopic and morphological characteristics and adequate analytical methods are essential to ensure the quality and standardize the prepared medicine. With this background, *BJT* was subjected for pharmacognostical and pharmaceutical analysis.

MATERIALS AND METHOD

Plant material

The raw drug materials were collected from the pharmacy department, IPGT & RA, GAU, Jamnagar. (Table-1)

Pharmacognostical Evaluation[4]

The raw drugs are identified and authentified and powder microscopy was done in the pharmacognosy department, IPGT & RA, GAU, Jamnagar. The study includes organoleptic evaluation and microscopic evaluation.

Microscopic Study

The individual powdered drug are first examined under distilled water for the observation of calcium oxalate crystals and other cellular materials, then stained with Phloroglucinol and conc. HCl [5] for the lignified characters, then stained with iodine to observe the starch grains. Raw drugs were separately studied under microscope, the diagnostic characters microphotographs are taken by using Carl zeiss trinocular microscope [6]. (Table-2)

Method of preparation of *BJT*

The drugs enlisted in the table number 1 were taken and BJT was prepared as per classics.

- *Kalka Dravyas* - 7 (*Vidarikanda, Draksha, Yashtimadhu, Madhooka, Bala, Nilotpala, Chandana*) -Each 20gm (Fine powder)
- *Drava dravyas – Go Dugdha* (Cow milk) -1 litre
- *Meatsoupe* – 1 litre
- *Tila Taila* – 750 ml

It was prepared according to classical *Taila Paka Kalpana.*

Organoleptic Study

Contents of BJT was evaluated for organoleptic characters like taste, odour and colour etc.[7]

Pharmaceutical evaluation

Physico-chemical analysis

Physico-chemical Parameters of *Brihat Jeevakadya Taila* like loss on drying, Specific gravity etc. were determined as per the API guideline. BJT was further subjected to High Performance Thin Layer Chromatography (HPTLC) study.

RESULTS AND DISCUSSION

The BJT showed very courageous result used has been analyzed. Study on *BJT* is a step towards pharmacognostical and pharmaceutical standardization of the drug.

Organoleptic study

Sr. No.	Characters	Observed
1	Colour	Brownish
2	Odour	Agreeable
3	Taste	Bitter and slightly sweet

Organoleptic characters of Contents of *Taila* like texture, colour, taste and odour are recorded separately and are depleted.

Microscopic Study

Contents of *Brihat Jeevakadya Taila* showed Prismatic crystal of *Bala*, Stellate trichome of *Bala*, Oil globule of *Chandana*, Border Pitted vessels *Chandana*, Acicular crystals of *Draksha*, Parenchyma cells of *Draksha*, Lignified multibranched trichome of *Kamal*, Pollen Grains with warty trichome of *Kamala*, Simple and compound starch grains *Madhuka*, Simple fibre of *Madhuka*, Simple and compound starch grains *Vidari*, Prismatic crystal of *Vidari*, Cotyledon surface view of *Tila*, Oil globule of *Tila* etc. of the contents. (Plate no. 1-14) The pharmacognostical studies reveals that the presence of starch grains, trichomes, parenchyma, prismatic crystals, oil globules and oleo resin. The observed characters are very commonly observed in all powdered drugs and are responsible for increase in the absorption through mucosa.

Physicochemical tests

Physicochemical analysis of BJT revealed loss on drying 0.1493% w/w, Specific gravity 0.9197gm, Refractive index 1.4780, Acid value 6.3589, Saponification value 151.95, Iodine value 72.21. All the pharmaco-analytical parameters of BJT were in permissible limits as per pharmacopoeial standards. (Table-3)

HPTLC study results:

Chromatographic study (HPTLC) was carried out under 254 and 366 nm UV to establish fingerprinting profile. It showed 8 of spots at 254 nm with Rf values and 7 spots at 366 nm with Rf values were recorded which may be responsible for expression of its pharmacological and clinical actions. (Table 4). The preliminary HPTLC study of the compound reveals the components are more sensitive to short UV 254nm having 8 spots compared to long UV 366 nm with 7 spots.

PLATE 1: Microphotographs of BJT

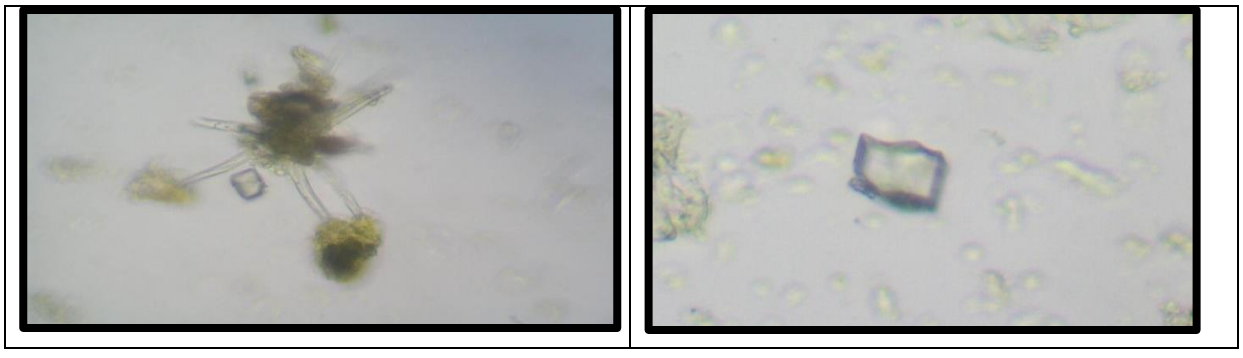

Figure 2: Stellate trichome of Bala

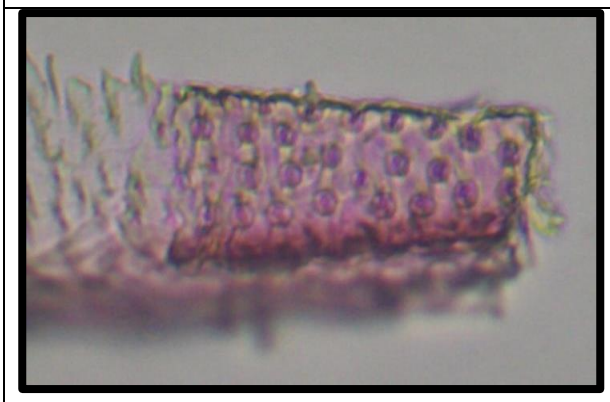

Figure 4: Border Pitted vessels of *Chandana*

Figure 1: Prismatic crystal of *Bala*

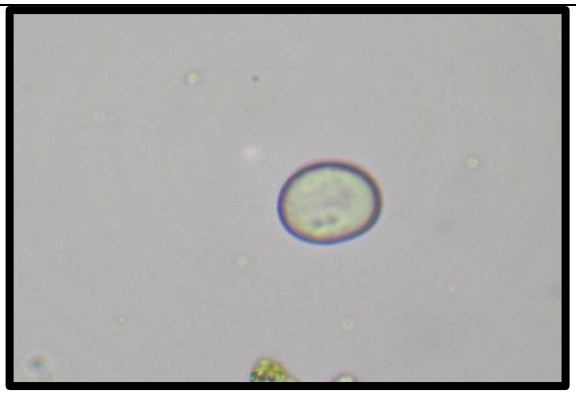

Figure 3: Oil globule of *Chandana*

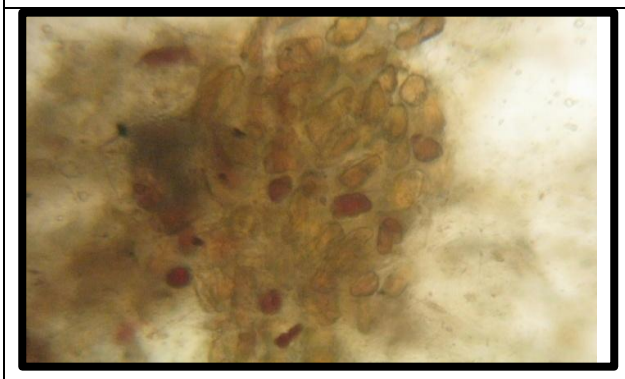

Figure 6: Parenchyma cells with brown content of *Draksha*

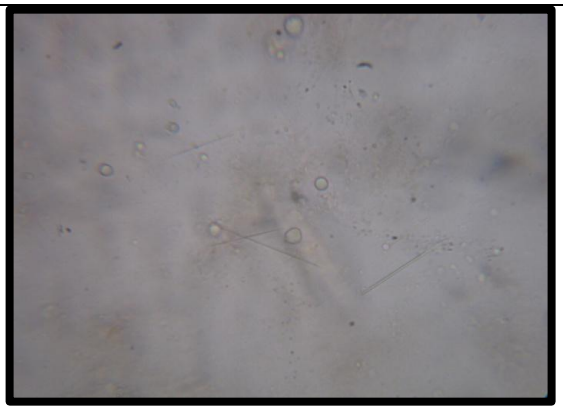

Figure 5: Acicular crystals of *Draksha*

Figure 8: Pollen Grains with warty trichome of *Kamal*

Figure 7: Lignified multibranched trichome of *Kamal*

Figure 10: Simple fibre of *Madhuka*

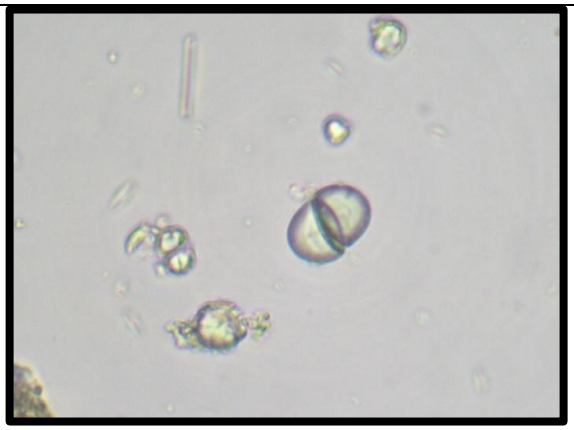

Figure 9: Simple and compound starch grains of *Madhuka*

Figure 12: Prismatic crystal of *Vidari*

Figure 11: Simple and compound starch grains of *Vidari*

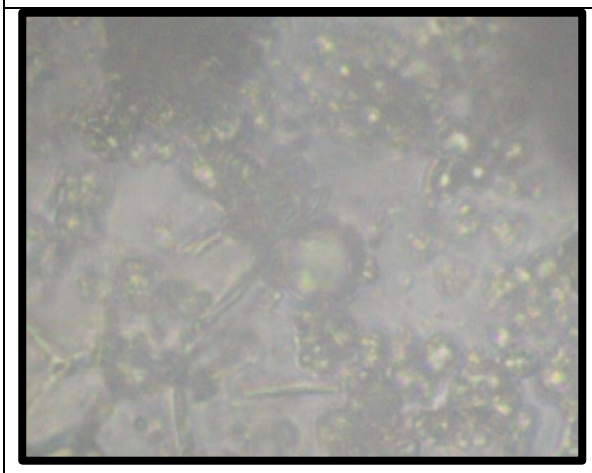

Figure 14: Oil globule of *Tila*

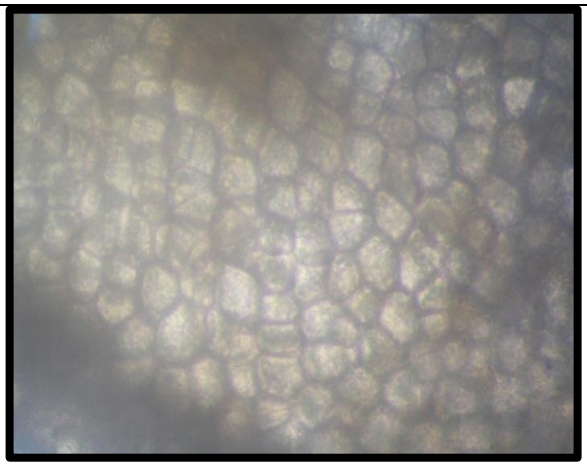

Figure 13: Cotyledon surface view of *Tila*

PLATE 2: Densitogram of *Brihat Jeevakadya Taila* at 254 and 366 nm.

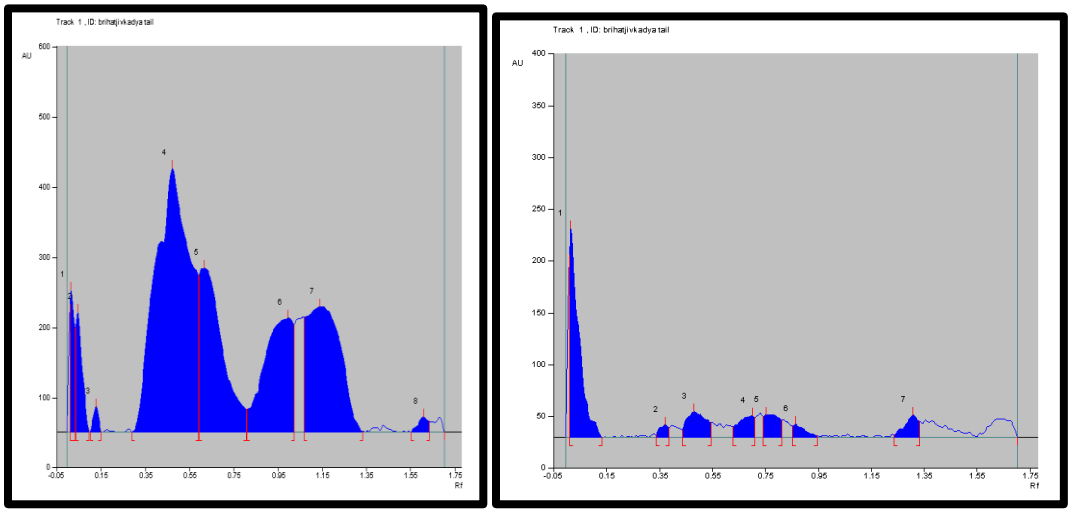

Table 1: Ingredients of *Brihat Jeevakadya Taila*

No.	Sanskrit Name	Latin/English Name	Part used	Quantity
1	Vidarikanda	Pueraria tuberosa DC	Root	20gm
2	Draksha	Vitis Vinifera Linn.	Fruit	20gm
3	Yashtimadhu	Glycyrrhiza glabra Linn.	Root	20gm
4	Madhooka	Madhuca indica J.F.Gmel	Flower	20gm
5	Bala	Sida cordifolia Linn.	Root	20gm
6	Nilotpala	Nymphaea nouchali Burm.	Flower	20gm
7	Chandana	Santalum album Linn.	Bark	20gm
8	Sharkara	Sugar		20gm
9	Godugdha	Cow milk		1 litre
10	Jangala Mansrasa	Goat Flesh Juice		1 litre
11	Tila Taila	Sesame oil		750ml

Table 2: Pharmacognostical Study

Sr. No.	Drug	Colour	Taste	Odour	Nature of powder	Microscopic Characters Identified
1	*Vidari Kanda*	White	Sweet	Aromatic	Coarse	Simple and compound starch grains, fibres, prismatic crystals, parenchyma cells.
2	*Draksha*	Black	Sweet	Characteristics	Coarse	Epidermis cells, reddish-brown contents, mesocarp cells, prismatic crystals of calcium oxalate, endosperm cells, oil globules and cluster crystals of calcium oxalate.
3	*Yasti-Madhu*	Specific	Sweet	Sweet	Coarse	Cork in surface view, prismatic crystals of

						calcium oxalate, crystal fibre, pitted vessels, fibres and starch grains.
4	*Madhooka*	Brown	Sweet	Sweet	Sticky	Brown contant, starch grains, trichomes oil globules
5	*Bala*	Greenish	Astringent, Bitter	Characteristics	Coarse	Prismatic crystal of, Stellate trichome
6	*Nilotpala*	Pinkish white	Sweet with stringent	Specific	Coarse	unicellular hairs, spongy parenchymatous cells, tannin content, lignified multilobed trichomes, pollen grains, epidermal cells.
7	*Chandana*	Creamish	Bitter	Aeromatic	Coarse	Border pitted vessels, lignified fibres, oil globule, starch grains, prismatic crystals
8	*Sharkara*	-	-	-	-	-
9	*Godugdha*	-	-	-	-	-
10	*Jangala Mansrasa*	-	-	-	-	-
11	*Tila Taila*	-	-	-	-	-

Table 3: Pharmaceutical Evaluation

Sr. No.	Test	Result
1	Loss on drying	0.1493% w/w
2	Specific gravity	0.9197
3	Refractive index	1.4780
4	Iodine value	72.21
5	Saponification value	149.56
6	Acid value	6.3589

Table 4: HPTLC of *Brihat Jeevakadya Taila*

Wavelength	Number of spots	Minimum Rf values
254nm	8	0.01, 0.04, 0.10, 0.29, 0.60, 0.81, 1.07, 1.56
366nm	7	0.01, 0.34, 0.44, 0.63, 0.75, 0.86, 1.26

CONCLUSION

Pharmacognostical and Phytochemical evaluation of BJT illustrated the specific characters of ingredients which were used in the preparation. All the Pharmaceutical parameters analyzed within the permissible range. On the basis of observations and experimental results, the evaluation research of BJT may be used as standard reference for further research work and clinical studies.

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