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# PHARMACOGNOSTICAL AND PHARMACEUTICAL EVALUATION OF *BRIHAT DASHMOOLA TAILA* - A HERBO- MINERAL AYURVEDIC FORMULATION

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## ABSTARCT

**Aim**: To evaluate the quality of drugs by using different analytical techniques. **Materials and Methods**: The raw drugs are identified and authenticated, and powder microscopy was done in the Pharmacognosy Laboratory, Institute for Post Graduate Teaching and Research in Ayurveda (IPGT), Gujarat Ayurved University (GAU), Jamnagar, Gujarat, India. The study includes organoleptic evaluation and microscopic evaluation. Physico-chemical parameters and high-performance thin layer chromatography (HPTLC) studies carried out at pharmaceutics laboratory, IPGT and RA, GAU, Jamnagar, Gujarat, India. The samples was subjected to accelerated stability by following standard guidelines. **Results and Discussion**: The pharmacognostical results of *Brihat Dashmoola Taila* confirmed the presence of disturbed scleriform vessels of *Agnimantha*, rhomboid cell of *Shalparni*, prismatic crystal of *Chavya*, *Bilwa* fibre with crystal, lig. parenchyma cell of *Prishnaparni*, *Shyonaka* lignified cork, bottle neck shaped cells of *Pippali*, *Brihati* lignified testa of seed, starch grains of *Shunthi* etc. Physico-chemical analyses were carried out by following the parameters referactive index at $40^0$ C is 1.4850, specific gravity at room temp.at $32^o$ C is 0.918, acid value is 0.391, iodine value is 34.89, saponification value is 31.85, loss on dryingis is 0.32. **Conclusion:** The physicochemical analysis are inferred that the formulation meets maximum qualitative standards.

**KEYWORDS**: *Brihat Dashmoola Taila*, Pharmacognosy, Pharmaceutics, HPTLC.

## INTRODUCTION

*Brihat Dashamoola Taila* is a herbo-mineral formulation. It is promisable formulation in the management of *Ardhavabhedaka* (Migraine). Taking a lead from the modern patho-physiology of migraine i.e. vascular theory; the in flowing tissue i.e. blood (*Rakta*) seems to be the targeted pathological tissue (*Dushya*) in its origin. *Rakta* being the similar factor of *Pitta* (on physiological & pathological grades); *Pitta* seems to be a major contribution pathological human in the origin of *Ardhavabhedaka* hence *Tridosha Shamaka* dominantly *Vata-Pitta Shamaka* line of treatment is taken here. *Ayurveda* has the *Nasya* therapy as master key for *Shiroroga*, method to rejuvenate the body and mind and to alleviate pain and stress. There is a specific indication of *Chatu-Sneha* orally as well as in the form of *Nasya* in the management of *Shiroroga*. *Brihat Dashamoola Taila* is mentioned in *Bhaishajya Ratnavali* in *Shirorogadhikara* chapter with special indication to *Ardhavabhedaka.*[1] *Nasya* is described as the best procedure in all *Urdhwajatrugata Rogas*. Also in a clinical study, the effect of *Dashamoola* in the management of sensory and motor disorders pertaining to sympathetic and parasympathetic outflow amongst the patients presenting with primary neurological disorders have been investigated significant improvement in nerve conduction velocity.[2] So, *Brihat Dashamoola Taila (Bhaishajya Ratnavli*) was taken for *Nasya* therapy. The Pre-clinical studies of *Brihat Dashmoola Taila* have already been carried out; in which standardization, pharmaceutical, pharmacological studies and also clinical observations on healthy volunteers were done. To maintain the therapeutic activity of the drug standardization is very much necessary.

**AIM AND OBJECTIVE:** To evaluate the quality of drugs by using different analytical techniques.

## MATERIALS AND METHODS

### Drug Material

Raw drug materials were collected from the pharmacy of Gujarat Ayurveda University. The ingredients and the part used are given in table no.[1]

### Method of preparation *(Brihat Dashmoola Taila)*

- Treat *Tila Taila* (Sesame oil) to prepare *Murchita Taila*. Wash and dry all the herbal raw materials thoroughly. All the ingredients were clean and weighed accurately.

Pulverize the dried ingredients numbered 1 to 10 (Kwatha Dravya) to a coarse powder, add specified amounts of water, heat and reduce the volume to one forth. Filter with muslin cloth to obtain the other ingredients (Kalka Dravya) numbered 13 to 27 in the formulation composition, powder and pass through sieve number 85.

- Transfer the powdered ingredients to a wet grinder and grind with sufficient quantity of water to prepare a homogeneous blend (*Kalka*).
- Take *Murchita Taila* in a stainless steel vessel and heat it mildly.
- Add increments of *Kalka*. Stir thoroughly while adding the *Kwatha and Swarasa*.
- Boiled on mild fire and stirred well continuously.
- The *Kalka* is taken out with the help of the ladle and tested for *Sneha Siddhi Lakshanas* and stage of the *Paka.*

After achieving all *Sidhi Lakshna* it was allow for cooling and kept in the glass container.

**Therapeutic benefits of *Brihat Dashmoola Taila***

the effect of *Dashamoola* in the management of sensory and motor disorders pertaining to sympathetic and parasympathetic outflow amongst the patients presenting with primary neurological disorders have been investigated significant improvement in nerve conduction velocity.[3]

**Pharmacognostical study**

Raw drugs were identified and authenticated by the Pharmacognosy laboratory, I.P.G.T & R.A., Jamnagar. The identification was carried out based on the morphological features, organoleptic features and microscopic study of the individual drugs was studied under the microscope attached with camera, with stain and without stain.[4] The microphotographs were also taken under the microscope.

**Physicochemical Evaluation**

*Brihat Dashmoola Taila* was analyzed by using standard qualitative and quantitative parameters, HPTLC was carried out after making appropriate solvent system with Methanolic extract of *Brihat Dashmoola Taila* at the Pharmaceutical Chemistry lab, I.P.G.T. & R.A. Gujarat Ayurveda University, Jamnagar.

## OBSERVATION AND RESULTS

### Organoleptic Evaluation

Various parameters of the material such as colour, odour, touch and taste of the *Brihat Dashmoola Taila* were observed and recorded.[5] Touch were analyzed with the help of *Darshana, Sparshana, ghrana and Rasana Pareeksha* mentioned in Ayurveda. (By sensory obsertabletons). Results were mentioned in the Table no.(2).

### Microscopic study

The powder microscopy of *Brihat Dashmoola Taila* confirmed the presence of disturbed scleriform vessels of*agnimantha,* rhomboid cell of *shalparni,* prismatic crystal of *chavya, bilwa* fibre with crystal, lig. parenchyma cell of *prishnaparni, shyonaka* lignified cork, bottle neck shaped cells of *pippali, brihati* lignified testa of seed, starch grains of *sunthi,* pitted vessels of *chitraka,* tannin content of *nisotha,* oleorasins of *haridra,* rhomboid cell of *shalparni,* lig. parenchyma of *prishnaparni,* lignified parenchyma of *daruharidra, crystal found in fibre of gambhari, group stone cells of gokshura,* vittae cells of *jeeraka,* starch grain with tannin-*kantakari,* oil globule of *maricha,* etc were the characteristic features of observed in microscopy of drug.(Plate No.1).

### Physico-chemical Analysis

Physio-chemical analyses were carried out by following the parameters refractive index at $40^0$ C is 1.4850, specific gravity at room temp. at $32^o$ C is 0.918, acid value is 0.391, iodine value is 34.89, saponification value is 31.85, loss on drying is 0.32. Results were mentioned in the table no. (3).

### High Performance Thin Layer Chromatography (HPTLC)

HPTLC was carried out after making appropriate solvent system with Methanolic extract of *Brihat Dashmoola Taila*. On performing HPTLC, visual observed *Taila* on under UV light showed few spots but on analyzing under densitometer at 254 nm and 366 nm it resulted into 10 and 6 spots respectively. Results of HPTLC are given in Table no. (4) and densitogram is shown in plate 2.

**Table No 1: *Brihat Dashmoola Taila* (*Bhaishajya Ratnavali*).**

| No. | Sanskrit Name | Latin/English Name | Part used | Ratio |
|---|---|---|---|---|
| 1 | ***Bilva*** | *Aegle marmelos* Carr. | Root | 5 parts |
| 2 | ***Agnimantha*** | *Clerodendrum multiforum* Linn. | Root, Stem bark | 5 parts |
| 3 | ***Shyonaka*** | *Oroxylum indicum* Vent. | Root | 5 parts |
| 4 | ***Gambhari*** | *Gmelina arborea* Roxb. | Root | 5 parts |
| 5 | ***Patla*** | *Stereospermum suaveolens* DC. | Root, Stem bark | 5 parts |
| 6 | ***Shalparni*** | *Desmodium gangeticum* (L.) DC. | Root | 5 parts |
| 7 | ***Prushniparni*** | *Uraria picta* Desv. | Root | 5 parts |
| 8 | ***Brihati*** | *Solanum indicum* Linn. | Root | 5 parts |
| 9 | ***Kantakari*** | *Solanum surattense* Burm. f. | Root | 5 parts |
| 10 | ***Gokshura*** | *Tribulus terrestris* Linn. | Fruit | 5 parts |
| 11 | ***Nirgundi Swarasa*** | *Vitex negundo* Linn. | Leaf | Equal to all contents |
| 12 | ***Ardraka swarasa*** | *Zingeber officinale* Roxb. | Fresh Rhizome | Equal to all contents |
| 13 | ***Pippali*** | *Piper longum* Roxb. | Fruit | 2 parts |
| 14 | ***Chavya*** | *Piper retrofractum* Vahl. | Fruit | 1 part |
| 15 | ***Chitraka*** | *Plumbago zeylanica* Linn. | Root | 1 part |
| 16 | ***Sunthi*** | *Zingeber officinale* Roxb. | Rhizome | 2 parts |
| 17 | ***Maricha*** | *Piper nigrum* Linn. | Fruit | 1 part |
| 18 | ***Shweta jiraka*** | *Cuminum cyminum* Linn. | Fruit | 1 part |
| 19 | ***Krishna jiraka*** | *Carum carvi* Linn. | Fruit. | 1 part |
| 20 | ***Sarshapa*** | *Brassica campestris* Linn. | Seed | 1 part |
| 21 | ***Nishotha*** | *Operculina turpethum* Linn. | Root | 1 part |
| 22 | ***Haridra*** | *Curcuma longa* Linn. | Rhizome | 1 part |
| 23 | ***Daruharidra*** | *Berberis aristata* DC. | Root | 1 part |
| 24 | ***Yavakshara*** | Pott. Carbonate | Whole | 1 part |
| 25 | ***Saindhava*** | E-Rock salt. | Whole | 1 part |
| 26 | ***Tila Taila*** | *Sesamum indicum* L. | Seed oil | Equal to all contents |

**Table 2: Organoleptic Characters Of *Brihat Dashmoola Taila*.**

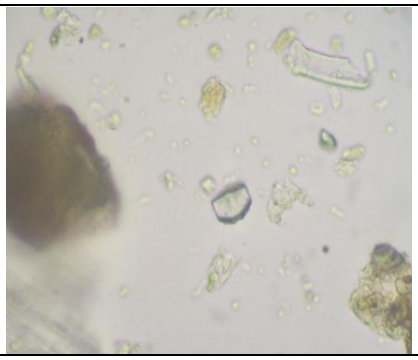
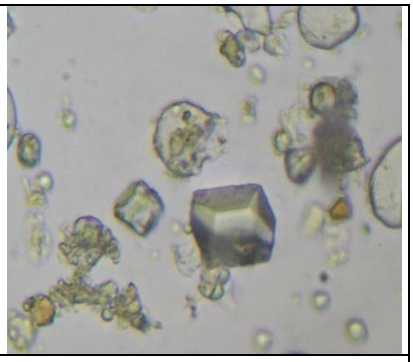
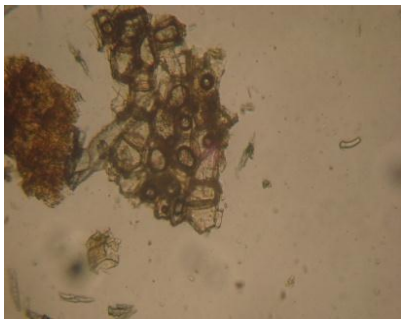
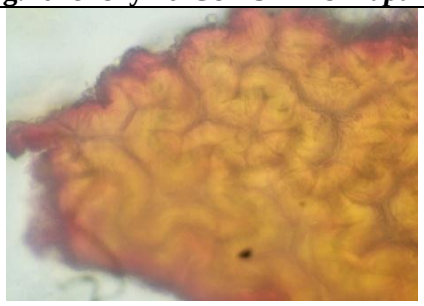
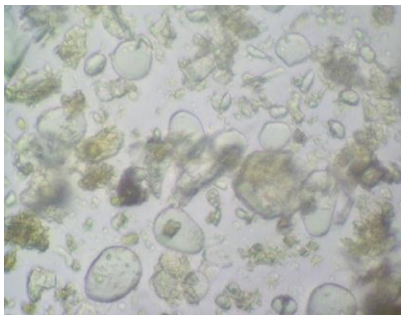
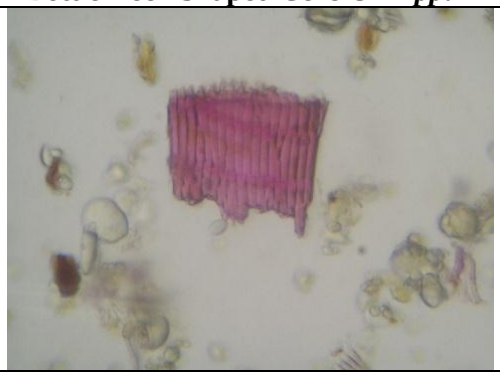
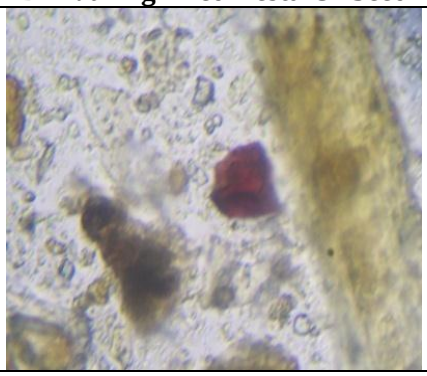
| Sr. No. | Characters | Observed characters of *Brihat Dashmoola Taila*: |
|---|---|---|
| 1 | Colour | Greenish Yellowish |
| 2 | Odour | Agreeable |
| 3 | Taste | Bitter |
| 4 | Touch | Lubricative |

**Table 3: Physico-chemical analysis of *Brihat Dashmoola Taila.***

| Sr.no | Parameters | *Brihat Dashmoola Taila* |
|---|---|---|
| 1 | Refractive Index at $40^0$ C | 1.4850 |
| 2 | Specific Gravity at $32^o$ C | 0.9108 |
| 3 | Acid Value | 0.391 |
| 4 | Iodine Value | 34.89 |
| 5 | Saponification Value | 31.85 |
| 6 | Loss on Drying (%w/W) | 0.32 |

**Table 4: Results of HPTLC of *Brihat Dashmoola Taila.***
**Solvent system– Toluene:** Ethyl acetate: Acetic Acid (7:2:1)

| Wave Lengths | Short UV (254nm) | Long UV (366nm) |
|---|---|---|
| No of Spots | 10 | 6 |
| Max. Rf value | 0.00,0.14,0.16,0.22,0.32,0.40, 0.48,0.58,0.79,0.86 | 0.01,0.06,0.14,0.16,0.80, 0.91 |

<table>
<tr><td>  </td><td>  </td><td>  </td></tr>
<tr><td>Disturbed Scleriform Vessels Ofagnimantha</td><td>Rhomboid Cell Of Shalparni</td><td>Prismatic Crystal Of Chavya</td></tr>
<tr><td>  </td><td>  </td><td>  </td></tr>
<tr><td>Bilwa Fibre With Crystal</td><td>Lig.Parenchyma Cell Of Prishnaparni</td><td>Shyonaka Lignified Cork</td></tr>
<tr><td>  </td><td>  </td><td>  </td></tr>
<tr><td>Bottle Neck Shaped Cells Of Pippali</td><td>Brihati Lignified Testa Of Seed</td><td>Starch Grains Of Sunthi</td></tr>
<tr><td>  </td><td>  </td><td>  </td></tr>
<tr><td>Pitted Vessels Of Chitraka</td><td>Tannin Content Of Nisotha</td><td>Oleorasins Of Haridra</td></tr>
</table>

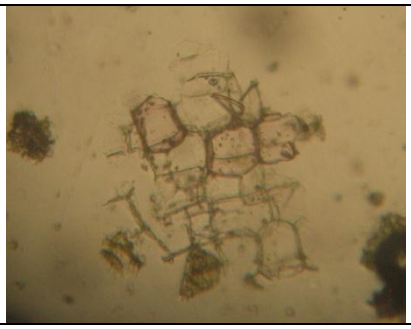
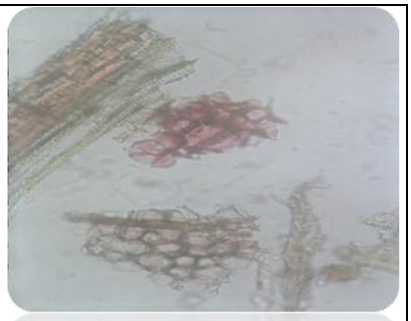
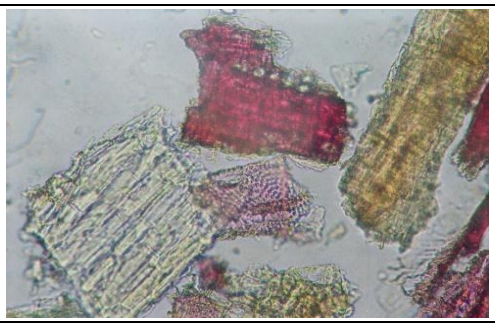
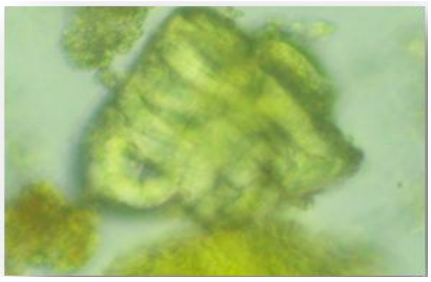
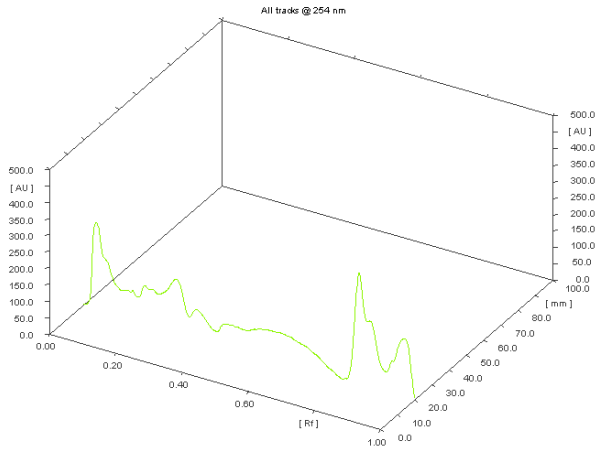
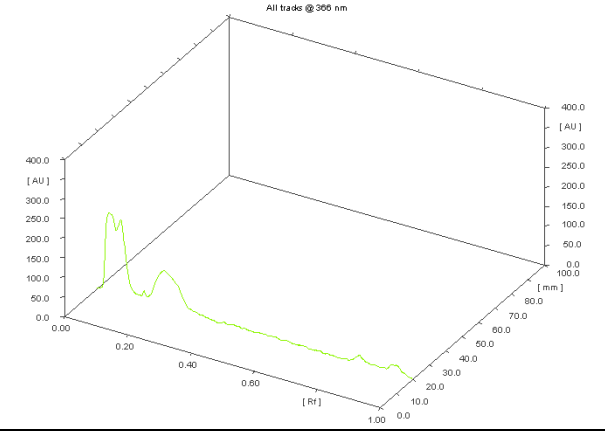
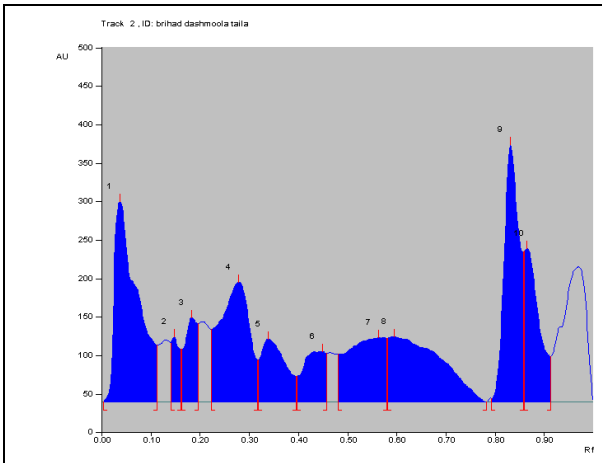
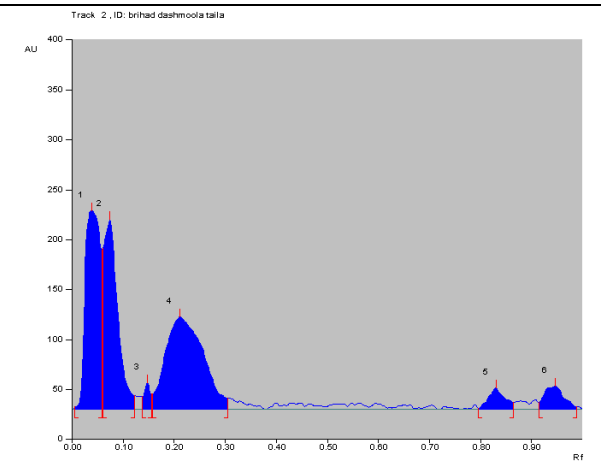
| | | |
|---|---|---|
|  |  |  |
| **Rhomboid Cell Of *Shalparni*** | **Lig.Parenchyma Of *Prishnaparni*** | **Lignified Parenchyma Of *Daruharidra*** |
|  |  |  |
| ***Crystal Found In Fibre of Gambhari*** | ***Group Stone Cells of Gokshura*** | **Vittae Cells of *Jeeraka*** |

**Plate No. 1: Microscopic Study of Raw Drugs Of *Brihat Dashmoola Taila.***

| | |
|---|---|
|   | 3D Graph: 254nm of ***BRIHAT DASHMOOLA TAILA*** |
|   | 3D Graph: 366 nm of ***BRIHAT DASHMOOLA TAILA*** |




**Chromatogaraphic Results(Peak Display) of *Brihat Dashmoola Taila* at short ultra.**




**Chromatogaraphic Results(Peak Display) of *Brihat Dashmoola Taila* at long ultra.**

**Plate No. 2: HPTLC Evaluation of *Brihat Dashmoola Taila.***

## DISCUSSION

Pharmacognosy and pharmaceutical evaluation of *Brihat Dashmoola Taila* was performed which is a potent medicine in the management of *Ardhavbhedaka* (Migraine). In physiochemical analysis; referactive index at $40^0$ C is 1.4850, specific gravity at room temp.at $32^o$ C is 0.918, acid value is 0.391, iodine value is 34.89, saponification value is 31.85, loss on drying is 0.32. Though the groundwork requisites for the standardization of *Brihat Dashmoola Taila* are covered in the current study, additional important analysis and investigations are required for the identification of all the active chemical constituents of the test drug to substantiate the clinical efficacy.

## CONCLUSION

Pharmacognostical study findings confirm that all characters were found in ingredient drugs of *Brihat Dashmoola Taila*. The physicochemical analysis are 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 Dashmoola Taila*. Thus Outcome of the study may be taken as standard references for the further studies.

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