



# Pharmaceutico-Analytical Study Of Bruhat Pippali Khanda- A Classical Formulation

Author: Dr.Bhoomika V R<sup>1</sup>,

Co-author: Dr. Nayana S Pai<sup>\*2</sup>

<sup>1</sup>Final year PG Scholar, Dept of RSBK, Alva's Ayurveda Medical College and Hospital, Moodubidire.

<sup>2</sup>Associate Professor, Dept of RSBK, Alva's Ayurveda Medical College and Hospital, Moodubidire.

## ABSTRACT

*Bruhat Pippali Khanda* is a polyherbal classical formulation mentioned in the text *Rasatantra Sara Siddha Prayoga Sangraha*. This formulation contains *Pippali Choorna* as a main ingredient. Other ingredients include *Goghrita*, *Godugdha*, *Shatavari Swarasa* and *Amalaki Swarasa* in the formulation along with 15 *Prakshepaka Choornas* and *Madhu*. This formulation is mainly indicated in *Amashoola*. *Bruhat Pippali Khanda* was prepared as per classical *Avaleha* and *Khanda Kalpana* procedure. Analytical study of the prepared formulation was undertaken according to the standards prescribed by 'The Ayurvedic Pharmacopeia of India'. The *Bruhat Pippali Khanda* is subjected to organoleptic characters analysis - colour, taste, odour, consistency and physico- chemical analysis like -pH, Total solid content, Total ash, Acid insoluble ash, Fat content, reducing sugar, HPTLC, Loss on drying at 105<sup>0</sup>C, Total sugar. All the physico- chemical test values are under permissible limit as mentioned in Ayurvedic Pharmacopeia of India

**Key Words** – *Khanda Kalpana*, *Avaleha*, *Bruhat Pippali Khanda*, Polyherbal formulation

## INTRODUCTION

Among various Ayurvedic pharmaceutical preparations '*Khanda Kalpana*<sup>1</sup>' is one, which comes under *Avaleha Kalpana* with better product acceptance and enhanced shelf life. The word '*Khanda*' means pieces or fragments, the *Khanda* is obtained by continuous heating of *Avaleha Kalpana*<sup>2</sup> until the preparation turns into 3-4 thread consistency. These preparations facilitates easy absorption and favors enhancement of shelf life. The formulation *Bruhat Pippali Khanda* is mentioned in *Rasatantrasara Va Siddha Prayoga Sangraha*<sup>3</sup> which contains *Pippali Choorna* as a main ingredient. *Pippali* is known bioavailability enhancer<sup>4</sup> possess rejuvenative<sup>5</sup>, immunomodulatory<sup>6</sup> and anti microbial<sup>7</sup> properties. Other ingredients include *Goghrita*, *Godugdha*, *Khanda Sharkara*, *Shatavari Swarasa*, *Amalaki Swarasa* along with 15 *Prakshepaka Dravyas* and *Madhu*.

*Bruhat Pippali Khanda* has ingredients which possesses immunomodulatory, antioxidant and rejuvenative properties which helps the body to fight against the diseases.

## AIMS AND OBJECTIVES

- To prepare *Bruhat Pippali Khanda* as per *Rasatantrasara Siddhaprayoga Sangraha*.
- To carry out Physico – Chemical analysis of *Bruhat Pippali Khanda*

## MATERIALS AND METHODS

### Collection of raw drugs

The raw drugs were collected from Alva's Pharmacy Mijar, Moodubidre and few ingredients such as *Goghritha*, *Godugdha* and wet *Amalaki* are purchased from local Market, Moodubidre. All the raw drugs were identified as genuine by experts from PG Department of Dravya Guna, Alva's Ayurveda Medical college, Moodubidre, Dakshina Kannada

Table1. Ingredients of *Bruhat Pippali Khanda*

SL No	DRUG NAME	BOTANICAL NAME	FAMILY	PART USED	QUANTITY
1	<i>Pippali</i> <sup>8</sup>	<i>Piper longum</i> Linn	Piperaceae	Fruit	16 Tola (192g)
2	<i>Goghrutha</i> <sup>9</sup>	-	-	-	32Tola (384 g)
3	<i>Khanda Sharkara</i> <sup>10</sup>	-	-	-	64 Tola (768g)
4	<i>Shatavari</i> <sup>11</sup>	<i>Asparagus racemosus</i> Willd	Liliaceae	Root	32Tola (384g)
5	<i>Amalaki</i> <sup>12</sup>	<i>Emblica officinalis</i> Gaertn	Euphorbiaceae	Fruit	64Tola (768g)
6	<i>Godugdha</i> <sup>13</sup>	-	-	-	128Tola (1536g)
7	<i>Ela</i> <sup>14</sup>	<i>Elettaria cardamomum</i> Maton	Lauraceae	Fruit	1Tola(12g)
8	<i>Twak</i> <sup>15</sup>	<i>Cinnamomum zeylanica</i> Blume	Lauraceae	Stem bark	1Tola(12g)
9	<i>Tejapatra</i> <sup>16</sup>	<i>Cinnamomum tamala</i> Nees	Lauraceae	Leaf	1Tola(12g)
10	<i>Haritaki</i> <sup>17</sup>	<i>Terminalia chebula</i> Retz	Combretaceae	Fruit	1Tola(12g)
11	<i>Krishna Jeeraka</i> <sup>18</sup>	<i>Carum carvi</i> Linn	Apiaceae	Fruit	1Tola(12g)
12	<i>Dhanyaka</i> <sup>19</sup>	<i>Coriandrum sativum</i> Linn	Umbellifereae	Fruit	1Tola(12g)
13	<i>Musta</i> <sup>20</sup>	<i>Cyperus rotundus</i> Linn	Cyperaceae	Tuberous roots	1Tola(12g)
14	<i>Vamshalochana</i> <sup>21</sup>	<i>Bambusa arundinacea</i> Willd	Poaceae	Silicaceous Con.	1Tola(12g)
15	<i>Amalaki(Dry)</i> <sup>22</sup>	<i>Emblica officinalis</i> Gaertn	Euphorbiaceae	Fruit	1Tola(12g)
16	<i>Shwetha Jeeraka</i> <sup>23</sup>	<i>Cuminum cyminum</i> Linn	Apiaceae	Fruit	6Masha(6g)
17	<i>Kustha</i> <sup>24</sup>	<i>Saussurea lappa</i> Clarke	Asteraceae	Root	1Tola(12g)
18	<i>Sunthi</i> <sup>25</sup>	<i>Zingiber officinale</i> Roxb	Zingiberaceae	Rhizome	6Masha(6g)

19	<i>Nagakesara</i> <sup>26</sup>	<i>Mesua ferrea</i> Linn	Guttiferae	Stamens	6Masha (6g)
20	<i>Jatiphala</i> <sup>27</sup>	<i>Myristica fragrans</i> Henlt	Myristaceae	Seed	6Masha(6g)
21	<i>Maricha</i> <sup>28</sup>	<i>Piper nigrum</i> Linn	Piperaceae	Fruit	6Masha(6g)
22	<i>Honey</i> <sup>29</sup>	-	-	-	8Tola(96g)

## Method of Preparation

*Bruhat Pippali Khanda* was prepared as per classical *Avaleha* and *Khanda Kalpana* procedure.

## Equipment used

1. Vessels- For preparing Leha
2. Measuring Jar – For weighing *Ghritha*, *Godugdha*, *Madhu*
3. Spatula – For mixing and stirring
4. Weighing Machine– For measuring ingredients
5. Kora cloth -To squeeze *Swarasa*
6. Thermometer – To measure the temperature
7. Bowl filled with water – To see *Siddhi Lakshana*
8. Glass container- To store the final product

## Poorva Karma

- All the *Prakshepaka Choornas* are pounded in the *Khalva Yantra* and grinder. It is made into fine powder by using the sieve of 85
- *Madhu* and *Ghritha* were measured and kept in a measuring jar
- *Khanda Sharkara* was pounded in *Khalva Yantra* and measured in weighing machine
- Kora cloth was washed and dried
- Round bottom stainless steel vessel was washed and dried
- Spatula was washed properly and dried
- Thermometer was kept ready to modulate the temperature
- Glass container for storage is cleaned properly and kept ready
- *Swarasa* of *Shatavari* and *Amalaki* was kept ready by measuring in measuring jar

### **Preparation of Shatavari Swarasa**

- *Shatavari* roots were washed thoroughly with water to remove physical impurities
- The roots were pounded in *Khalva Yantra*
- *Swarasa* was extracted by squeezing the pulp with Kora cloth
- Filtration of *Swarasa* was done to remove the physical impurities
- Later the collected *Swarasa* was measured and kept ready

### ***Preparation of Amalaki Swarasa***

- The *Amalaki* fruits were washed with water and deseeded
- The deseeded *Amalaki* fruits were pounded in *Khalva Yantra*
- *Swarasa* was extracted by squeezing the pulp with *Kora* cloth
- Filtration of *Swarasa* was done to remove the physical impurities
- Later the collected *Swarasa* was measured and kept ready

### ***Pradhana Karma***

- *Godugdha* (768g) was heated, *Pippali Choorna*(192g) was mixed and allowed to heat until the mixture turns into *Khova* consistency.
- *Goghrita*(384g) was added to the *Khova* consistency and boiled. *Shatavari Swarasa*(384g), *Amalaki Swarasa* (768g) and *Khanda Sharkara*(1536g) were added and boiled continuously till the preparation turns into semisolid consistency.
- The preparation was taken out of the fire, all the 15 *Prakshepaka Choornas* (12g each) were added and homogeneously mixed.
- After self-cooling *Madhu*(96g) was added and mixed well.

### ***Paschat Karma***

After cooling, the formulation was kept in an airtight glass container with labelling



Fig.1 Heating of *Godugdha*



Fig.2 Addition of *Pippali Choorna*



Fig.3 Mixing homogeneously



Fig.4 Khova consistency



Fig.5 Addition of *Goghrita*

Fig.6 Addition of *Shatavari Swarasa*





Fig.7 Addition of *Amalaki Swarasa*



Fig. 8 Addition of *Khanda Sharkara*



Fig.9 *Avaleha* Consistency



Fig.10 Addition of *Madhu*



Fig.11 Storing in airtight container



Fig.12 Final product

## OBSERVATIONS AND RESULTS

Table.2 Observations during preparation

SL.No	Time	Temperature	Observations
1.	11.55am	40 <sup>0</sup> C	<ul style="list-style-type: none"> <li>✓ <i>Godugdha</i> was heated</li> <li>✓ Fumes from <i>Godugdha</i> started to appear</li> </ul>
2.	12.00pm	41 <sup>0</sup> C	<i>Pippali Choorna</i> was added
3.	12.09pm	49 <sup>0</sup> C	<ul style="list-style-type: none"> <li>✓ Bubbles from the <i>Godugdha</i> mixture were started to appear from the centre of S.S vessel</li> <li>✓ <b>Colour of <i>Godugdha</i> changed to light brown</b></li> </ul>
4.	12.11pm	49 <sup>0</sup> C	<i>Ghrita</i> was added
5	12.14pm	50 <sup>0</sup> C	<ul style="list-style-type: none"> <li>✓ Bubbles started to appear at the centre</li> <li>✓ <i>Ghrita</i> did not mix completely</li> </ul>
6	12.17pm	50 <sup>0</sup> C	<b><i>Ghrita</i> completely mixed with <i>Pippali Choorna</i></b>
7.	12.26pm	50 <sup>0</sup> C	<ul style="list-style-type: none"> <li>✓ Colour changed from light brown to dark brown</li> <li>✓ Preparation turned into thick consistency</li> <li>✓ <b>Odour of <i>Pippali</i> was noted</b></li> </ul>
8.	12.34pm	50 <sup>0</sup> C	✓ Preparation turned into darker brown colour
9.	12.44pm	50 <sup>0</sup> C	<ul style="list-style-type: none"> <li>✓ <b>Reduction in mass and volume</b></li> <li>✓ Preparation turned into thicker mass</li> </ul>

10.	12.57pm	50 <sup>0</sup> C	<ul style="list-style-type: none"> <li>✓ Preparation turned into thicker consistency</li> <li>✓ <b>Colour became darker brown</b></li> <li>✓ Appearance of fumes</li> <li>✓ Evaporation of Liquid</li> </ul>
11.	1.05pm	50 <sup>0</sup> C	<ul style="list-style-type: none"> <li>✓ <b>Ghrita started to separate from the mass</b></li> <li>✓ Complete condensation of liquid milk was observed</li> </ul>
12.	1.10pm	55 <sup>0</sup> C	Separated <i>Ghrita</i> started to boil
13.	1.17pm	60 <sup>0</sup> C	<ul style="list-style-type: none"> <li>✓ <b>Odour of Khova was more predominant</b></li> <li>✓ Stirring was done continuously</li> </ul>
14.	1.50pm	63 <sup>0</sup> C	<ul style="list-style-type: none"> <li>✓ Preparation turned like a Bolus consistency (Appeared like Khova)</li> <li>✓ <b>Khova appeared in dark brown colour</b></li> </ul>
15.	2.15pm	60 <sup>0</sup> C	<ul style="list-style-type: none"> <li>✓ Odour of <i>Ghrita</i> was more predominant than before</li> <li>✓ Continuous stirring of Khova was done</li> <li>✓ <b>Khova turned little harder</b></li> <li>✓ <b>Khova was darker than before</b></li> </ul>
16.	2.23pm	70 <sup>0</sup> C	<ul style="list-style-type: none"> <li>✓ Addition of <i>Shatavari Swarasa</i></li> <li>✓ Stirring was done continuously</li> </ul>
17.	2.24pm	70 <sup>0</sup> C	<ul style="list-style-type: none"> <li>✓ Addition of <i>Amalaki Swarasa</i></li> <li>✓ Stirring was done continuously</li> </ul>
18.	2.27pm	70 <sup>0</sup> C	<ul style="list-style-type: none"> <li>✓ Addition of Sugar</li> <li>✓ Stirring was done continuously</li> </ul>
19.	2.28pm	75 <sup>0</sup> C	<ul style="list-style-type: none"> <li>✓ Bubbles started to appear from centre</li> </ul>

20.	2.30pm	80 <sup>0</sup> C	<ul style="list-style-type: none"> <li>✓ Preparation appeared light in colour and viscous</li> <li>✓ <b>Shiny upper layer of <i>Ghrita</i> was noticed</b></li> </ul>
21.	2.39pm	100 <sup>0</sup> C	<ul style="list-style-type: none"> <li>✓ Boiling started from the centre</li> <li>✓ <b>Colour changed into light brown</b></li> </ul>
22.	2.42pm	100 <sup>0</sup> C	<ul style="list-style-type: none"> <li>✓ Noticed boiling at the centre along with the bubbles</li> <li>✓ <b>Evaporation of Liquid portion (<i>Shatavari Swarasa</i>, <i>Amalaki Swarasa</i>) was noted by the appearance of fumes during boiling</b></li> </ul>
23.	2.58pm	100 <sup>0</sup> C	<ul style="list-style-type: none"> <li>✓ <b>Appearance of <i>Asanna Paka Lakshana</i></b></li> <li>✓ <b>Consistency of the preparation became thicker and more viscous</b></li> <li>✓ Odour of <i>Pippali Choorna</i> and <i>Ghrita</i> was appreciated predominantly</li> <li>✓ Appearance of bubbles from the centre was continued</li> </ul>
24.	3.13pm	80 <sup>0</sup> C	<ul style="list-style-type: none"> <li>✓ <b>Preparation attained thicker consistency and more viscous</b></li> <li>✓ Brown in colour</li> <li>✓ Bubbles continued to appear from the centre</li> </ul>

25.	3.21pm	80 C	<ul style="list-style-type: none"> <li>✓ <b>One thread consistency was appeared</b></li> <li>✓ <b>Preparation turned into dark brown colour</b></li> <li>✓ <b>Taste of <i>Pippali</i> was appreciated</b></li> <li>✓ <b>Odour of <i>Pippali</i> was predominant</b></li> </ul>
26.	3.27pm	70 <sup>0</sup> C	<ul style="list-style-type: none"> <li>✓ <b>Preparation obtained was thicker</b></li> <li>✓ <b>Difficulty was observed during stirring</b></li> </ul>
27.	3.56pm	65 <sup>0</sup> C	<ul style="list-style-type: none"> <li>✓ <b>Preparation obtained was thicker than previous</b></li> <li>✓ <b>Continuous appearance of bubbles</b></li> <li>✓ <b>Preparation appeared browner</b></li> </ul>
28.	4.07pm	70 <sup>0</sup> C	<ul style="list-style-type: none"> <li>✓ <b>Consistency was more thicker and shiner</b></li> <li>✓ <b>Preparation appeared dark brown</b></li> </ul>
29.	4.19pm	70 <sup>0</sup> C	<ul style="list-style-type: none"> <li>✓ <b><i>Siddhi Lakshana's</i> of <i>Lehya</i> was appeared</b></li> <li>✓ <b>Stove kept off</b></li> </ul>
30.	4.21pm	60 <sup>0</sup> C	<ul style="list-style-type: none"> <li>✓ <b>15 <i>Prakshepaka Choornas</i> was added and mixed homogeneously</b></li> <li>✓ <b>Preparation was darker brown and thicker</b></li> </ul>
31.	4.22pm	57 <sup>0</sup> C	<ul style="list-style-type: none"> <li>✓ <b>Kept for cooling</b></li> </ul>
32.	4.50pm	42 <sup>0</sup> C	<ul style="list-style-type: none"> <li>✓ <b><i>Madhu</i> was added</b></li> <li>✓ <b>Mixed homogeneously</b></li> </ul>

33.	4.55pm	42 <sup>0</sup> C	✓ Stored the final product in airtight glass container
-----	--------	-------------------	--

**Table.3 OBSERVATIONS AFTER PREPARATION:**

SL.NO	Observations	Results
1	Quantity taken	4.108Kg
2	Quantity obtained	2.212Kg
3	Loss	1.896Kg
4	Time duration	6hrs and 30 minutes

**Table.4 ORGANOLEPTIC CHARECTERISTICS**

SL.NO	OBSERVATIONS	RESULTS
1	Colour	Dark brown
2	Odour	Sweet characteristics odour of ingredients
3	Consistency	Semisolid
4	Taste	<i>Madhura Pradhana Katu</i>
5	Appearance	Semisolid

## ANALYTICAL STUDY

Analytical study of the prepared formulation was undertaken according to the standards prescribed by 'The Ayurvedic Pharmacopeia of India'. The Analytical study of *Bruhat Pippali Khanda* was done in SDM research centre, Udupi, Karnataka.

**Table 5. Analytical parameters of *Bruhat Pippali Khanda***

Parameter	<i>Bruhat Pippali Khanda</i> Results n=3 %w/w
Loss on drying	3.96±0.02
Solid Content	83.00
p <sup>H</sup>	3.78
Total Ash	3.23±0.52
Acid insoluble Ash	0.0±0.0
Total fat	16.0

Total Sugar	68.00
Reducing Sugar	11.23
Non- reducing Sugar	56.77

## DISCUSSION

The *Bruhat Pippali Khanda* includes two *Swarasa- Amalaki* and *Shatavari Swarasa*. *Amalaki Swarasa* contains B vitamins, including Vitamin B1 (thiamine), B2 (riboflavin), B3 (niacin), and B5 (pantothenic acid). These are essential for energy metabolism, nerve function, and red blood cell formation. *Amalaki* contains small amounts of Vitamin E, which is known for its antioxidant properties. These antioxidant properties can help to protect cells from damage. *Shatavari Swarsa* includes saponins, flavonoids, alkaloids, and various vitamins and minerals. It's known for its potential benefits in supporting overall health and boosting immunity.

The presence of *Ghrita* and *Madhu* in this formulation contributes to their stability and extended shelf life. The *Sneha Dravya* possesses natural antioxidant properties that help to prevent oxidative deterioration and preserve the potency of the herbal ingredients over time. *Ghrita* and *Madhu* are not only carriers for the active ingredients but also provide their own medicinal benefits. *Ghrita* is considered an essential *Rasayana* in Ayurveda, known for its nourishing and rejuvenating properties. Depending on the choice of *Ghrita* or *Madhu*, the *Avaleha* can be used to balance specific *Doshas* in the body, addressing the underlying *Dosha* imbalances causing the health conditions.

*Khanda Sharkara* facilitate the metabolism and adsorption of the active ingredients in the mouth itself. This controlled absorption helps in delivering the therapeutic effects gradually, ensuring better assimilation and efficacy of the herbal compounds. *Prakshepaka Choornas* such as *Maricha*, *Ela*, *Shunti* acts as bioavailability enhancer, improves the metabolism and adds overall nutritive value to the human health.

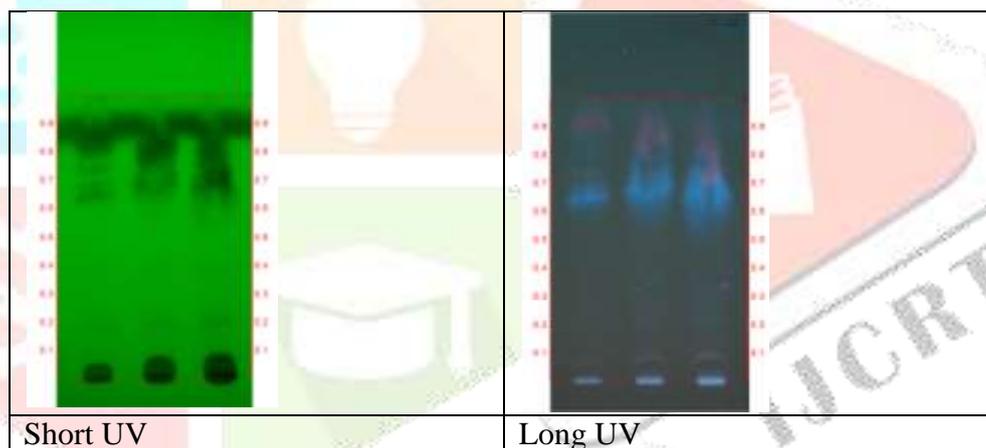
*Bruhat Pippali Khanda* contains ingredients which are *Katu Pradhana Madhura Rasa*, these ingredients have *Srotoshodhana*, *Deepana*, *Pachana* and *Kapha Vilayana* property. They act on *Kapha* and *Vata* disorders, hence this formulation is indicated for *Swasa*, *Kasa*, *Aruchi* and *Amashoola*

On testing, the pH of the *Bruhat Pippali Khanda* (table 5) was found to be 3.78%w/w, Total Ash was 3.23%w/w, Acid insoluble ash was 0, Total fat was 16% w/w, Total Solid was 83% w/w, total Sugar was 68% w/w and reducing sugar was 11.23% w/w and Non reducing Sugar was 56.77%w/w.

pH value of *Bruhat Pippali Khanda* indicates that the formulation is acidic. Ash value 3.23%w/w suggest that the number of inorganic compounds present in the formulation is less and indicates the perfection of pharmaceutical procedure carried out. Acid insoluble ash was 0 which suggest that there is no presence of Silica and the raw material used for the preparations are properly cleaned and final product is favouring

the Standards. Total Solid was 83%w/w indicates that the product *Bruhat Pippali Khanda* has a significant number of solid components compared to the liquid components. The ingredients such as *Pippali* and 15 *Prakshepaka Choornas* such as *Ela*, *Amalaki*, *Shwetha Jeeraka*, *Kushta*, *Shunti*, *Nagakesara*, *Jatiphala*, *Maricha*, *Vamshalochana*, *Twak*, *Tejapatra*, *Haritaki*, *Krishna Jeeraka*, *Dhanyaka*, *Musta* contribute to the solid content. Total Sugar was found to be 68%w/w. Out of this 11.23%w/w was reducing sugar and 56.77%w/w was non reducing sugar. Non reducing sugar lack free aldehyde or Ketone groups and they cannot reduce another compound. Hence, they actively participate in oxidative reactions whereas reducing sugar has aldehyde and Ketone group and they can reduce other compounds. Therefore, these both sugars provide necessary energy required to the body by acting as a catalyst for the reaction.

In High performance thin layer chromatography (HPTLC) study of *Bruhat Pippali Khanda* (ethanol extract) using Toluene: Diethyl ether: Acetone (6.25: 2.15: 1.4) visual observation was done under UV light (Fig) showed (Table no) 4 spots at short UV at Rf 0.20,0.65,0.69 and 0.74. At long UV, chromatogram showed 4 spots at 0.65,0.69,0.74, 0.92. Densitometric scan of the sample *Bruhat Pippali Khanda* is shown in Figure.13



Track 1 - *Bruhat Pippali khanda* – 4 $\mu$ l

Track 2 - *Bruhat Pippali khanda* – 8 $\mu$ l

Track 3 - *Bruhat Pippali khanda* – 12 $\mu$ l

Solvent system – Toluene: Diethyl ether: Acetone (6.25: 2.15: 1.4)

Table.6: Rf values of sample of *Bruhat Pippali khanda*

Short UV	Long UV
0.20 (Green)	-
0.65 (Green)	0.65 (F. blue)
0.69 (Green)	0.69 (F. blue)
0.74 (Green)	0.74 (F. blue)
-	0.92 (F. blue)

\*F –fluorescent; D – dark; L - light

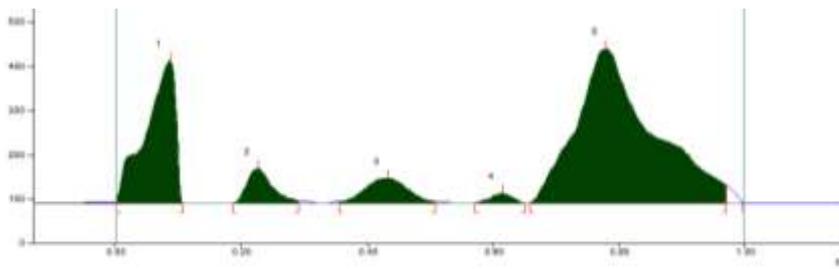
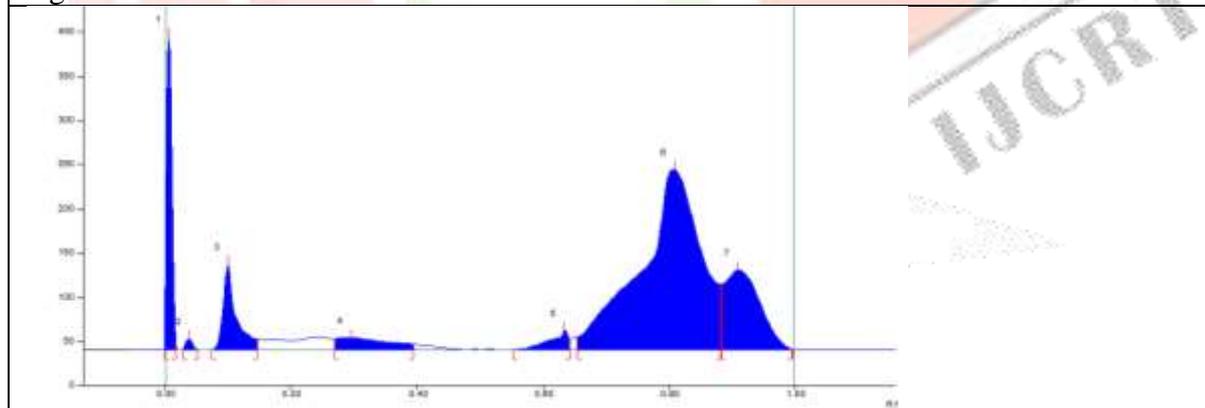


Figure. 13 Denisitometric scan of the sample of Bruhat Piplai Khanda

Track 3, ID: Bhruhath pipalli khanda

Peak	Start Position	Start Height	Max Position	Max Height	Max %	End Position	End Height	Area	Area %
1	0.00 Rf	7.8 AU	0.09 Rf	322.9 AU	39.00 %	0.11 Rf	0.4 AU	10858.0 AU	23.26 %
2	0.19 Rf	0.3 AU	0.23 Rf	78.4 AU	9.47 %	0.29 Rf	5.5 AU	2248.7 AU	4.82 %
3	0.36 Rf	3.2 AU	0.43 Rf	55.8 AU	6.74 %	0.51 Rf	3.6 AU	2779.8 AU	5.95 %
4	0.57 Rf	0.6 AU	0.62 Rf	22.0 AU	2.66 %	0.65 Rf	0.1 AU	554.9 AU	1.19 %
5	0.66 Rf	1.7 AU	0.78 Rf	348.8 AU	42.12 %	0.97 Rf	40.7 AU	30239.4 AU	64.78 %

Fig. 14a at 254nm



Track 3, ID: Bhruhath pipalli khanda

Peak	Start Position	Start Height	Max Position	Max Height	Max %	End Position	End Height	Area	Area %
1	0.00 Rf	0.0 AU	0.01 Rf	354.0 AU	44.64 %	0.02 Rf	10.0 AU	2114.4 AU	9.45 %
2	0.03 Rf	0.5 AU	0.04 Rf	12.1 AU	1.53 %	0.05 Rf	0.3 AU	94.7 AU	0.42 %
3	0.07 Rf	0.1 AU	0.10 Rf	97.0 AU	12.23 %	0.15 Rf	12.1 AU	1417.9 AU	6.34 %
4	0.27 Rf	12.4 AU	0.30 Rf	13.8 AU	1.74 %	0.40 Rf	6.4 AU	821.5 AU	3.67 %
5	0.55 Rf	0.1 AU	0.64 Rf	22.2 AU	2.80 %	0.64 Rf	12.3 AU	442.5 AU	1.98 %
6	0.65 Rf	14.1 AU	0.81 Rf	203.6 AU	25.68 %	0.88 Rf	74.0 AU	13761.3 AU	61.50 %
7	0.88 Rf	74.0 AU	0.91 Rf	90.3 AU	11.39 %	1.00 Rf	0.4 AU	3722.4 AU	16.64 %

Fig. 14b at 366nm

## CONCLUSION

*Bruhat Pippali Khanda* is a unique classical formulation mentioned in *Rasatantra Sara* and *Siddha Prayoga Sangraha*. This formulation is indicated in *Amlapitta, Swasa, Kasa* and *Aruchi*. This formulation can be used as a best rejuvenative tonic. Preparation of this formulation took 6hrs 30 minutes with quality yield. The findings of analytical study found to be within the prescribed limit as per API Standards. Analytical study findings of *Bruhat Pippali Khanda* can be considered as preliminary standard for further studies.

## REFERENCES

1. V M Kabeer Abdul, M S Krishnamurthy, Critical review on Avaleha Kalpana and its different dosage form. International Journal of Research in Ayurveda and Pharmacy. April 2020;11(2):99-102
2. Sharangadhara, Sharangadhara Samhita, English translation by Srikantha Murthy, Reprint Edition. New Delhi, Chaukhambha Publications; 2017, Chpt.8, Pg.No.111
3. Gopal Krishna Kaledha, Rasatantra Sara Va Siddha Prayoga Sangraha, Rajasthan: Krishna Gopal Ayurveda Bhavan; 10th edition 2005, Dwithiya Khanda Pg. No. 486.
4. Singh Satyapal, J S Tripathi and N P Rai, An appraisal of the bioavailability enhancers in Ayurveda in the light of pharmacological advances. 2016, 37(1); 3-10
5. <https://www.1mg.com/ayurveda/pippali-169>. Accessed on 24/09/2022
6. <https://doi.org/10.1016/j.jep.2003.10.016>. Accessed on 24/09/2022
7. <https://doi.org/10.1016/j.jep.2003.10.016>. Accessed on 24/09/2022
8. Ministry of AYUSH, Government of India, The Ayurvedic Pharmacopeia of India, Pharmacopeia commission for Indian Medicine and Homeopathy 1st edition 2008, Part-1 volume-4 Pg. No.42.
9. Bhavamishra, Bhavaprakasha Niganthu translated by D. S Lucas, First Edition, Varanasi; Choukambha Vishvabharathi, 2017, Pg.No.537
10. Ibid, Pg.No. 556
11. Ministry of AYUSH, Government of India, The Ayurvedic Pharmacopeia of India, Pharmacopeia commission for Indian Medicine and Homeopathy 1st edition 2008, Part-1 volume- 4 Pg.No.108
12. Ministry of AYUSH, Government of India, The Ayurvedic Pharmacopeia of India, Pharmacopeia commission for Indian Medicine and Homeopathy 1st edition reprinted 2001, Part-1 volume-1 Pg. No.4
13. Bhavamishra, Bhavaprakasha Niganthu translated by D. S Lucas, First Edition, Varanasi; Choukambha Vishvabharathi, 2017, Pg.No 524
14. Acharya Sharma Priyavrat, Dhanwantari Niganthu, translated by Dr.Guru Prasad Sharma Choukambha Orientalia, Varanasi ; Edition 2008, Pg.No.77

15. Ministry of AYUSH, Government of India, The Ayurvedic Pharmacopeia of India, Pharmacopeia commission for Indian Medicine and Homeopathy 1st edition reprinted 2001, Part-1 volume-1 Pg.No 113
16. Ministry of AYUSH, Government of India, The Ayurvedic Pharmacopeia of India, Pharmacopeia commission for Indian Medicine and Homeopathy 1st edition reprinted 2001, Part-1 volume-1Pg.No.115.
17. Ibid Pg.No.47
18. Ibid Pg. No.73
19. Ibid Pg.No 30
20. Ibid Pg.No.129
21. Sharma Priyavrat, Dhanwantari Niganthu, translated by Dr.Guru Prasad Sharma Choukambha Orientalia, Varanasi ; Edition 2008, Pg.No.110
22. Ministry of AYUSH, Government of India, The Ayurvedic Pharmacopeia of India, Pharmacopeia commission for Indian Medicine and Homeopathy 1st edition reprinted 2001, Part-1 volume-1Pg. No.4
23. Ibid Pg.No.106
24. Ibid. Pg.No.76
25. Ibid.Pg.No.103
26. Sharma Priyavrat, Dhanwantari Niganthu, translated by Dr.Guru Prasad Sharma Choukambha Orientalia, Varanasi ; Edition 2008, Pg.No.22
27. Ministry of AYUSH, Government of India, The Ayurvedic Pharmacopeia of India, Pharmacopeia commission for Indian Medicine and Homeopathy 1st edition reprinted 2001, Part-1 volume-1Pg. No.53
28. Ibid Pg.No. 115
29. Bhavamishra, Bhavaprakasha Niganthu translated by D. S Lucas, First Edition, Varanasi; Choukambha Vishvabharathi, Pg.No 104