Pharmaceutico-Analytical Study and Standardization of Dhaturadalakatu Tailam

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Abstract
Dhatura (Dhaturametel) is a well-known drug for curing pain related with swelling of body parts. Rasatarangni has mentioned its external application in various forms for Vatavikaras, so as Bhavaprakasha¹ in vatavyadhi. A snehapakakalpana is mentioned in Rasatarangni with leaves of Dhatura(Dhaturametel) and katutaila(mustard oil) for Mamsagatavata(muscular dystrophy) as external application².

Snehapāka was subjected according to the general rule of snehakalpanai.e in ratio of 1 part Kalka (fine paste of Dhaturametel leaves), 4 parts of Katutaila(Mustard oil) and 16 parts of water to that of kalka³. It was to heat until the taila siddha laksanas were obtained. After preparation of oil it was subjected for organolepticanalysis as mentioned in API Part II protocols. The results obtained were ash value .03%, loss of drying at 105°C w/w .02%, refractive index at 40°C 1.4665, acid value 1.81, saponification value 170.15, iodine value 104.66, and volatile matter 5.24% w/w as per API- II protocols.

Keywords
Dhatura (Dhaturametel), Rasatarangni, Katutaila (mustard oil), Mamsagatavata, snehapaka
INTRODUCTION

Snehakalpana is one of the kalpana of bhaishajyakalpana. Although there are five basics kalpanas mentioned in Ayurveda text, snehakalpana is not included among these primary kalpanas by acharyas. But snehakalpanahas its own importance in clinical practice particularly for vatavyadhies because of its counteracting gunas to that of vataguna. Dhuratradalakatutailam is unique combination of Dhatura leaves and Katutaila indicated in Mamsagatavata. Therefore, to standardize Dhuratradalakatutailam present study was focused on pharmaceutical and analytical study of Dhuratradalakatutailam.

MATERIALS AND METHODS

Present work of “Pharmaceuticoanalytical study and Standarization of Dhuratradalakatutailam” was divided into 2 parts:
1. Pharmaceutical study
2. Analytical study

PHARMACEUTICAL STUDY

Preparation of Dhuratradalakatutailam
- Fresh leaves of Dhatura were obtained from college herbal garden, washed thoroughly and made kalka (fine paste of Dhatura leaves). Kalka, 125 gm was weighted and stored for further procedures.
- Katutaila (mustard oil) 4 times to that of kalkawas taken in clean steel vessel i.e., 500 ml and to this 4 times of water was added i.e., 2 litres.
- It was subjected to Snehapakaon madhymaagni until the water started evaporating. Temperature recorded during this phase was approximately 120°C.
- Once the moisture content was reduced sufficiently, flame was reduced to Mruduagni to avoid burning of kalka.
- After 2 hours of paka, Sneha siddhi qualities started to appear. Kalka was subjected to examination as mentioned in classics for Vartipareksha, agnipareksha of varti for knowing any water content left in Kalka.
- After observing all the qualities of Snehapaka flame was stopped and the vessel was taken out of gas stove. Siddha snehawas filtered through double layered cotton cloth in warm stage.
- After self-cooling Dhuratradalakatutailam was preserved in clean glass bottle.

Precautions
Continuous stirring of *drava*-dravya (kalka-oil and water) was done to avoid sticking of *kalka* to the bottom of the vessel.

- The size of the vessel should be sufficient to avoid any spillage of content outside.

**ANALYTICAL STUDY**

**Analytical Parameters**

*Organoleptic Characters*

Colour (*rupa*), odour (*gandha*), appearance (*rupa*), touch (*sparsh*), taste (*rasa*), clarity.

*Physico-chemical Parameters*

Ash value, Loss of drying at 105°C w/w, Refractive index at 40°C, acid value, Saponification value, Iodine value, Volatile matter w/w as per API- II protocols.

**OBSERVATION AND RESULTS**

- Initially the colour of oil was golden in colour. As the snehapaka progressed change in colour was observed.

- Sticky nature of *kalka* was observed throughout the process. As the paka progressed to its completion all *lakshanas* of snehasiddhi were observed i.e. *gandha* and *varnaoutpatti*. Colour of snehain final stage changed to dark green coloured.

- Appearance of *phena* (froth, bubbles) was observed. A small quantity of *Kalka* was taken out and taken in between fingers, it assumed a *varti* (wick-like shape) and on doing *agnipareksha* (flame test) it doesn’t produced any crackling and hissing sound (*shabdapradhurbhava*) indicating the *Madhyamsnehapaka*.

**RESULTS**

Organoleptic changes observed are tabulated as follows:

**Table No. 1 - Organoleptic parameters**

<table>
<thead>
<tr>
<th>S. NO.</th>
<th>Parameter</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Colour</td>
<td>Dark</td>
</tr>
<tr>
<td>2.</td>
<td>Odour</td>
<td>Characteristic</td>
</tr>
<tr>
<td>3.</td>
<td>Appearance</td>
<td>Oily</td>
</tr>
<tr>
<td>4.</td>
<td>Touch</td>
<td>Snigdha</td>
</tr>
<tr>
<td>5.</td>
<td>Clarity</td>
<td>Opaque</td>
</tr>
<tr>
<td>6.</td>
<td>Taste</td>
<td>Mild tikta</td>
</tr>
</tbody>
</table>

**Table no. 2 - Physico-chemical parameters**

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Name of the test</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Ash value</td>
<td>.03%</td>
</tr>
<tr>
<td>2.</td>
<td>Loss of drying at 105°C w/w</td>
<td>.02%</td>
</tr>
<tr>
<td>3.</td>
<td>Refractive index at 40°C</td>
<td>1.4665</td>
</tr>
<tr>
<td>4.</td>
<td>Saponification value</td>
<td>170.15</td>
</tr>
<tr>
<td>5.</td>
<td>Iodine value</td>
<td>104.66</td>
</tr>
<tr>
<td>6.</td>
<td>Volatile matter w/w</td>
<td>5.24%</td>
</tr>
</tbody>
</table>

**DISCUSSION**
Dhaturadalakatutailam is unique preparation mentioned in Rasatarnagani for Mamsagatavata (muscular dystrophy) comprising the snehapaka of katutaila with dhaturapatra. Sneha itself by virtue of its snigdhaguna counteract the rukshaguna of vata. Katutaila being usna and tikshnainguna helps in curing Vatavyadhi by virtue of better penetration in body tissues. Dhatura leaves are also said to have vatasamanaguna as dhaturais sothahara and vedanaharain action. Murchanaof Katutailawith Dhaturapatra enhances the medicated qualities and action of this oil in curing Mamsagatavata.

The physic-chemical tests performed were as per the protocol mentioned in API part II and were found to be significant.

- Ash value- ash values are helpful in determining the quality and purity of crude drugs, especially in powder form. The objective of ashing drugs is to remove all traces of organic matter, which may otherwise interfere in an analytical determination. On incineration, crude drugs normally leave an ash usually consisting of carbonates, phosphates and silicates of sodium, potassium, calcium and magnesium. The value was found to be 0.03%.

- Loss of drying at 105°C w/w - Loss on Drying Test is designed to measure the amount of water and volatile matters in a sample when the sample is dried under specified conditions. It is obtained by drying 1 to 2 g of the sample, accurately weighed, at 105°C for 3 hours; the loss in weight is not more than 0.50% of the sample. Here in this study loss drying at 105°C was found to be .02% which is significant.

- Refractive index at 40°C - The oil must be clear free from rancidity, suspended or foreign matter, separated water, added colouring, or flavoring substances or mineral oil. The value obtained is 1.4665 which is normal for mustard oil.

- Saponification value - Saponification value represents the number of milligrams of potassium hydroxide required to saponify 1g of fat under the conditions specified. It is a measure of the average molecular weight (or chain length) of all the fatty acids present. The value obtained is 170.15.

- Iodine value - The iodine value in is the mass of iodine in grams that is consumed by 100 grams of a chemical substance. Iodine numbers are often used to determine the amount of unsaturation in fatty acids.
The value obtained is 104.66.

CONCLUSION
Oil is best material mentioned for any Vatavyadhi. Snehasakti of oil with any vathahara drug enhances its property. Dhaturadalakatutailam is one such type of preparation mentioned in Rasatarangani for Mamsagatavata (muscular dystrophy) prepared with leaves of Dhaturametel and Mustard oil (Katutaila). Final drug subjected to oraganoletic and physico-chemical analysis as per the API part II protocols. The results obtained were ash value .03%, loss of drying at 105°C w/w .02%, refractive index at 40°C 1.4665, acid value 1.81, saponification value 170.15, iodine value 104.66, volatile matter 5.24% w/w. All these values are found to be normal limits showing the significant Pharmaceutico-analytical properties of Dhaturadalakatutailam.
REFERENCES


