Pharmacognostical and Physico-chemical Evaluation of Nagaradi Kashaya

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Abstract
Lifestyle disorders are one of the biggest health issues towards the world. Faulty dietary habit is the cause of many digestion related diseases like Constipation, Irritable Bowel Syndrome, Gastroesophageal Reflux Disease, Peptic ulcers etc. The ingredients of NagaradiKashaya, Nagar (Rhizome of Zingiberofficinale), Musta (Rhizome of CyperusRotundus) and Ativisha (Root of Aconitumheterophyllum) are very good appetizer and have stomachic, laxative, digestive, carminative, stimulant, expectorant, thermogenic and anthelmintic properties which helps to digest food properly and maintain the digestive capacity. The drug is going to be used in the form of coarse powder and will be subjected to pharmacognostical and physicochemical evaluation. The pharmacognostical results show simple starch grains of Shunthi, fibres of Ativisha, annular vessels of Musta etc. The physicochemical results show pH value of 6.5, loss on drying 4.56% w/w and ash value of 7.2% w/w.

Keywords
Pharmacognosy, Pharmaceutics, NagaradiKashaya

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INTRODUCTION

The quality of life and quality of diet have changed in present era. Due to today’s chaotic and busy lifestyle people cannot follow rules of consuming food i.e., Aharavidhivisheshayatana\(^2\). All these factors cause harmful effect on digestive system of human beings and promote Irritable Bowel Syndrome, Gastro Esophageal Reflux Disease etc diseases. In this study NagaradiKashaya is used in Grahanidosha i.e., all kind of disturbance in Jatharagni (digestive capacity). 

Nagara, Musta and Ativisha are having Dipana, Pachana, Vatanulomana, Grahietc properties which are useful to improve digestive power and to correct Grahanidosha. Till date no reference has been found on NagaradiKashaya. In the present study it is subjected for the pharmacognostical and phytochemical aspects to evaluate the drug.

Table 1 Ayurvedic properties of NagaradiKashaya:\(^3\)

<table>
<thead>
<tr>
<th>Dravya</th>
<th>Rasa</th>
<th>Guna</th>
<th>Virya</th>
<th>Vipaka</th>
<th>Doshaghnata</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nagar</td>
<td>Katu</td>
<td>Laghu</td>
<td>Snigdha</td>
<td>Ushna</td>
<td>Madhura</td>
</tr>
<tr>
<td>Musta</td>
<td>Katu</td>
<td>Laghu</td>
<td>Ruksha, Tikshna</td>
<td>Ushna</td>
<td>Katu</td>
</tr>
<tr>
<td>Ativisha</td>
<td>Tikta, Katu</td>
<td>Laghu</td>
<td>Ruksha</td>
<td>Ushna</td>
<td>Katu</td>
</tr>
</tbody>
</table>

Contents of NagaradiKashaya are having KatuRasa, UshnaVirya and KatuVipaka hence it works as AgniDeepaka and PachakaDravya. So it is useful in conditions such as Grahanidosha by improving Jatharagni.

MATERIALS AND METHODS

Collection of Raw Drugs:

All the raw drugs of NagaradiKashaya were collected from Pharmacy of Gujarat Ayurved University, Jamnagar.

Selection of drug:

Trial drug NagaradiKashaya is a poly herbal formulation available in the form of Yavakuta. Three drugs of NagaradiKashaya described in CharakaSamhita, GrahanidoshaChikitsaAdhyayawere combined in equal quantity and the patients were advised to make decoction with proper method.

Method of preparation of NagaradiKashaya:

NagaradiKashaya was prepared in Pharmacy of Gujarat Ayurved University, Jamnagar. Ingredients, part used and ratio of the drugs is given in Table-1. All three ingredients taken in equal quantity in the
form of *Yavakuta* (coarse powder) and mixed thoroughly.

### Table 2 Contents of Nagaradi Kashaya

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Content</th>
<th>Latin name</th>
<th>Part used</th>
<th>Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Nagara</td>
<td><em>Zingiber officinale</em> Roxb.</td>
<td>Rhizome</td>
<td>1 part</td>
</tr>
<tr>
<td>2</td>
<td>Musta</td>
<td><em>Cyperus rotundus</em> Linn.</td>
<td>Rhizome</td>
<td>1 part</td>
</tr>
<tr>
<td>3</td>
<td>Ativisha</td>
<td><em>Aconitum heterophyllum</em> Wall.</td>
<td>Root</td>
<td>1 part</td>
</tr>
</tbody>
</table>

**Pharmacognostical Evaluation:**

Raw drugs taken for *Nagaradi Kashaya* were identified and authenticated by the Pharmacognosy department. The identification was carried out based on the morphological, organoleptic features and microscopy of the raw drugs and *Nagaradi Kashaya*. Microphotographs were taken by using Carl-Zeiss Trinocular microscope.

**Pharmaceutical Evaluation:**

Following parameters were analyzed for different physico-chemical parameters by today’s routine methods at the pharmaceutical chemistry lab, IPGT& RA, Jamnagar.

**Physico-chemical Parameters:**

Testing of following physico-chemical parameters was carried out as per standard method.

- Loss on Drying at 110°C
- Total Ash value
- Water Soluble Extract
- Methanol Soluble Extract

### OBSERVATION AND RESULTS

**Organoleptic findings:**

Organoleptic findings of *Nagaradi Kashaya* are given in Table -2.

### Table 3 Organoleptic Examination

<table>
<thead>
<tr>
<th>Properties</th>
<th>Nagaradi Kashaya</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colour</td>
<td>Muddy brown</td>
</tr>
<tr>
<td>Odour</td>
<td>Slightly aromatic</td>
</tr>
<tr>
<td>Texture</td>
<td>Coarse</td>
</tr>
<tr>
<td>Taste</td>
<td>Tikta (Bitter), Katu (pungent)</td>
</tr>
<tr>
<td>Touch</td>
<td>Coarse</td>
</tr>
</tbody>
</table>

**Pharmacognostical study:**

The initial purpose of the study was to confirm the authenticity of the raw drugs used in the preparation of *Nagaradi Kashaya*. This was achieved by carrying out microscopy of the raw drug i.e.; simple starch grains of *Sunthi*, simple starch grains of *Musta* along with hilum, compound starch grains of *Ativisha*, cork in surface view of *Shunthi*, cork with brown content of *Ativisha*, prismatic crystal of *Ativisha*, fibers of *Ativisha*, fibres of *Shunthi*, annular vessels of *Musta*, stone cells of *Ativisha*,...
parenchyma cells of Musta, deposition of Musta, olioresin content of scealeriforumvessles of Shunthi, silica Shunthi, pitted vessels of Ativisha etc.

Plate 1: Microphotographs of NagaradiKashaya:

1. Starch grains of Shunti
2. Starch grains of Musta
3. Simple and compound starch grains of Ativisha

4. Parenchyma cells of Ativisha
5. Oil globules of Musta
6. Stone cells and scleroids of Ativisha

7. Prismatic crystals of Ativisha
8. Fibres of Shunti
9. Fibres of Musta
Pharmaceutical Evaluation

Physico-Chemical parameters of NagaradiKashaya like Total ash value, Water soluble extract, Methanol soluble extract, pH 5% v/w aqua solution, Loss on drying all were found to be within the normal range. Details are given in Table-3. HPTLC was carried out after organizing appropriate solvent system in which maximum 13 spots were distinguished at 254 nm and 11 spots at 366 nm. Results are depicted in the Table No.4.

<table>
<thead>
<tr>
<th>Sr no.</th>
<th>Parameters</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Loss on Drying at 110 C</td>
<td>4.65%w/w</td>
</tr>
<tr>
<td>2</td>
<td>Total Ash value</td>
<td>7.2%w/w</td>
</tr>
<tr>
<td>3</td>
<td>Water Soluble Extract</td>
<td>9.5%w/w</td>
</tr>
<tr>
<td>4</td>
<td>Methanol Soluble Extract</td>
<td>4.4%w/w</td>
</tr>
<tr>
<td>5</td>
<td>pH 5% v/w aqua solution</td>
<td>6.5</td>
</tr>
</tbody>
</table>

Table 4 Results of the Drug Analysis on Physico-chemical Parameters
HPTLC of *NagaradiKashaya* was done in an appropriate solvent system in which 13 spots were found at 254 nm and 11 spots at 366 nm. Table 5 shows No. Of spots and their Rf value observed under UV radiation.

**Table 5** Results of HPTLC of *NagaradiKashaya*

<table>
<thead>
<tr>
<th>Track</th>
<th>Solvent system</th>
<th>Observation under UV radiation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>254 nm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No.of spots</td>
</tr>
<tr>
<td>NagaradiKasha</td>
<td>Toluene (7ml) : Ethyl acetate (2ml): Acetic acid (1ml)</td>
<td>13</td>
</tr>
</tbody>
</table>

**Plate-4** HPTLC of *NagaradiKashaya* at 254 and 366nm

**HPTLC 3-D graph of *NagaradiKashaya* at 254 and 366nm**
Below figure shows Chromatographic separation of *NagaradiKashaya* in appropriate solvent system at day light, Chromatographic separation at 254 nm and chromatographic separation at 366 nm.

**DISCUSSION**

The ingredients of *NagaradiKashaya* are *Tikta* (bitter), *Katurasa* predominant *UshnaVeerya*, *Katuvipaka*, *Laghu* and *Ruksha* in nature with obvious alleviating action on all *Dosha*. It also has *Dipana*, *Pachana* and *Grahi* properties which can be used to correct *Grahanidosha* and improve digestion power i.e. *Agni*. In the present study a pharmaceutical preparation of *NagaradiKashaya* was carried out. Pharmaceutical properties have to be studied for authenticity of drug; hence the formulation was subjected to minimum Pharmacognostical and Pharmaceutical analysis. Pharmacognostical evaluation of raw drugs used in *NagaradiKashaya* showed the specific characteristic features found in microscopy confirm the authenticity of the drugs.

**CONCLUSION**

*NagaradiKashaya* formulation was subjected to Pharmacognostical and Pharmaceutical analysis. Pharmacognostical findings confirmed the ingredients of...
NagaradiKashaya. Physico-chemical and HPTLC studies confirmed that ingredients of drug formulation meet the minimum quality standards at primary level. Generated results are specific and may consider for the further research works.
REFERENCES


