ANALYTICAL STUDY OF SUKUMAR GHrita WITH MURCHHANA AND WITHOUT MURCHHANA

Anuradha Chaurasia¹, Ankit Kumar Gupta² and Sanjay Kumar Pandey³

¹Third Year PG Scholar, Department of Rasa Shastra and Bhaishajya Kalpana.
²Associate Professor, Department of Rasa Shastra and Bhaishajya Kalpana.
³Head and Professor, Department of Rasa Shastra and Bhaishajya Kalpana.
Govt. PG Ayurvedic College and Hospital, Varanasi, Uttar Pradesh, India.

ABSTRACT

Sukumar Ghrita is a unique polyherbal Ayurvedic formulation recommended in the management of various Vataj and Pitaj disorders mentioned in Astanga Hridaya and also in Sahastrayog and the formula given is the same, selected for present study. Aim of the study was to develop the pharmacognostical and physico-chemical profile of Sukumar Ghrita. Sukumar Ghrita was prepared as per classical methods in the Ayurvedic Pharmacy, Government Ayurvedic College, Varanasi and analytical findings were systematically recorded. The samples were subjected to organoleptic and physico-chemical analysis. Physicochemical analysis of the finished product were carried out, to evaluate the quality of the formulation. Results are further used for any other research works.

KEYWORDS: Sukumar Ghrita, Physico-chemical analysis.

INTRODUCTION

Analysis is very important for drugs as because it deals with life. Drug quality starts from identification, way of collection, in process during preparation and finished product etc.

In the present study, the Sukumar Ghrita is subjected to Pharmaceutical analysis. Ghrita is generally used in the vatapatic disorder and seem to improve. Ghrita is considered as the best “sneha dravya” because of its speciality i.e. Samskarsya anuvartanam (the continuance of refinement) means Ghrita carries the properties of drug without leaving its own inherent properties.
Many Samskara (procedures) are mentioned in the Ayurvedic classics for drugs to modify or reduce the undesired effects. Murchana Samskara (processing of ghee) is one among these Samskara (procedure) mentioned for Ghrita (ghee) and Taila (oil) to reduce undesired effects and add beneficial effects. Murchana Samskara (processing of ghee) is first mentioned by Bhaishajya Ratnavali in the context of Jwara Chikista (treatment of fever) to reduce Amadosha (product of impaired digestion), Durgandhata (bad odour), other doshas (undesired properties) and this process also enhances the Viryata (potency) unsaturated fatty acids of the Sneha (fat). Sukumara Ghrita is one of the Ghrita (ghee) preparation mentioned in Ghrita Prakarana of Sahasra Yoga, Ayurveda Formulary of India, and The Ayurvedic Pharmacopoeia of India.

Sukumara Ghrita is indicated in Vibandha (constipation), Udara (diseases of abdomen / enlargement of abdomen), Gulma (abdominal lump), Pleeha roga (splenic disease), Vidradhi (abscess), Shopha (oedema), Yonisula (pain in female genital tract), Arsha (Haemorrhoids), Vriddhi (Hydrocele), Vatavyadhi (diseases due to Vata Dosha), Vatarakta (gout) and also as a Snehapanana (oleation therapy) in Purvakarma (preceding procedure) for Virechana (purgation therapy) or Vamana (emesis therapy). Sukumara Ghrita is one of the examples for Yamaka (combination of two Sneha (fat)) type of Sneha (fat) which contains Ghrita (ghee) and Eranda Taila (castor oil) as ingredients. Physicochemical analysis of drugs will provide some standards to assess its quality and helps to understand pharmacokinetics and pharmacodynamics of the drug. Physicochemical analysis, standardization of drugs and final product will provide some significant outcome of Murchana (process).

AIMS AND OBJECTIVES

- To analyze the Sukumar Ghrita by utilizing suitable parameters to develop standard.
- To compare analyze the samples in order to see the changes occurred in intermediate and final product.

MATERIALS AND METHODS

The samples of Sukumara Ghrita prepared with Amurchita Ghrita (unprocessed ghee) and Sukumara Ghrita prepared with Murchita Ghrita (processed ghee) were subjected for analysis as per the references available in protocol for testing published by CCRAS.

Samples of Ghrita

Sample A. Murcchita ghrita 1st sample
Sample B. Sukumar ghrita with murcchana 2\textsuperscript{nd} sample
Sample C. Sukumar ghrita without murcchana – 3\textsuperscript{rd} sample

All these samples were analysed by using different parameters like-
1. Organoleptic evaluation
2. Physicochemical evaluation

**Physical parameters**
- pH
- Loss on drying at 105ºC
- Specific gravity
- Weight Per Ml
- Refractive Index

**Chemical parameters**
- Acid Value.
- Saponification Value
- Rancidity Test
- Peroxide Value
- Iodine Value
- Viscosity
- H.P.T.L.C.

**OBSERVATIONS AND RESULTS**
According to Sharangadhara (Sha. Sam. M. Kh. 9/12-14) the emission of good smell, color and taste are the other tests for Sneha paka respectively. Hence, the organoleptic characters like colour, odour, taste, consistency of the samples were noted.

The organoleptic characters of different samples have been presented in tabula format below.

<table>
<thead>
<tr>
<th>Organoleptic characters</th>
<th>Murchit ghrita</th>
<th>Murchit sukumar ghrita</th>
<th>Amurchit sukumar ghrit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colour</td>
<td>Light yellow</td>
<td>Dark yellow</td>
<td>Yellowish green</td>
</tr>
<tr>
<td>Odour</td>
<td>Astringent</td>
<td>Sour, astringent odour</td>
<td>Bitter, astringent odour</td>
</tr>
<tr>
<td>Taste</td>
<td>Astringent</td>
<td>Sour, astringent taste</td>
<td>Bitter, astringent odour</td>
</tr>
<tr>
<td>Consistency</td>
<td>Viscous</td>
<td>Viscous</td>
<td>Less viscous</td>
</tr>
</tbody>
</table>
PHYSIC CHEMICAL PARAMETERS

Results of Physico chemical parameters

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Murchita Ghrita</th>
<th>Murchit Sukumar Ghrita</th>
<th>Amurchita Sukumar Ghrita</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refractive index at 40°C</td>
<td>1.4751</td>
<td>1.4741</td>
<td>1.4736</td>
</tr>
<tr>
<td>Specific gravity at 25°C</td>
<td>0.908</td>
<td>0.921</td>
<td>0.918</td>
</tr>
<tr>
<td>Saponification value</td>
<td>226.55</td>
<td>229.95</td>
<td>232.42</td>
</tr>
<tr>
<td>Acid value</td>
<td>0.85</td>
<td>3.22</td>
<td>3.33</td>
</tr>
<tr>
<td>Iodide value</td>
<td>30.31</td>
<td>22.52</td>
<td>47.58</td>
</tr>
<tr>
<td>Loss on drying at 105°C</td>
<td>0.45</td>
<td>0.21</td>
<td>0.39</td>
</tr>
<tr>
<td>Viscosity (cps) Spindle no 4, RPM-10 at 25°C</td>
<td>4560</td>
<td>4512</td>
<td>4460</td>
</tr>
<tr>
<td>Ester value</td>
<td>225.69</td>
<td>226.73</td>
<td>229.09</td>
</tr>
<tr>
<td>Rancidity</td>
<td>Absent</td>
<td>Absent</td>
<td>Absent</td>
</tr>
<tr>
<td>Weight per ml(g) at 25°C</td>
<td>0.904</td>
<td>0.918</td>
<td>0.914</td>
</tr>
<tr>
<td>Peroxide value</td>
<td>0.95</td>
<td>6.45</td>
<td>0.89</td>
</tr>
<tr>
<td>Free fatty acid (%w/w)</td>
<td>0.43</td>
<td>1.62</td>
<td>1.67</td>
</tr>
</tbody>
</table>

DISCUSSION

Murchana process (processing of ghee) converted the golden yellow colour of the Ghrita (ghee) to dark golden yellow colour of the Sukumara Ghrita. The colour is due to the Kwatha Dravya (drugs used for decoction) like Dashamoola, Trinapanchamoola and Guda (jaggery).

The characteristic smell of Ghrita (ghee) converted into bitter, astringent odour in case of Sukumara Ghrita prepared with Amurchita Ghrita (unprocessed ghee). It is due to the contact of drugs like Dashamoola, Trinapanchamoola, etc. The characteristic smell of Ghrita (ghee) converted into sour, astringent odour in Sukumara Ghrita prepared with Murchita Ghrita (processed ghee), it is due to the contact of drugs used in Murchita Ghrita (processed ghee) and drugs like Dashamoola, Trinapanchamoola, etc. The characteristic taste of Ghrita (ghee) converted into bitter, astringent taste in Sukumara Ghrita prepared with Amurchita Ghrita (unprocessed ghee) is due to contact of drugs like Dashamoola, Trinapanchamoola, etc. The characteristic taste of Ghrita (ghee) converted into sour, astringent taste in Sukumara Ghrita prepared with Murchita Ghrita (processed ghee) is due to contact of drugs used in Murchita Ghrita (processed ghee) and Dashamoola, Trinapanchamoola, etc. Viscous consistency of Sukumara Ghrita is due to dissolution of bio constituents into Ghrita (ghee) from the drugs used for preparation and removal of water.

Refractive Index

There is no significant change in the refractive index of Sukumara Ghrita prepared with Amurchita Ghrita (unprocessed ghee) and Murchita Ghrita (processed ghee).
As ghee is denser than air, refractive index is always more than one. That it is confirmed in this study. Increase in refractive index of Sukumara Ghrita prepared with Murchita Ghrita (processed ghee) indicates the increase of its density. It is due to the dissolution of bio constituents in the Murchita Ghrita (processed ghee). Refractive index of ghee also depends on the chain length. With increase in chain length, refractive index of ghee increases. Little increase in Refractive index of Sukumara Ghrita was observed when it was prepared with Murchita Ghrita (processed ghee), suggesting increase in the degree of unsaturation indicating the essential role of unsaturated fatty acids on the health, especially in reducing the cholesterol and Low-Density Lipids (LDL) levels.

**Specific Gravity @ 40°C**
Sukumara Ghrita prepared with Murchhita Ghrita (processed ghee) is more than Amurchhit Sukumar Ghrita. Increase in specific gravity after Murchana (procedure) indicates addition of some bio constituents from the drugs used for Murchana (procedure).

**Saponification value**
Saponification value indicates the measure of fatty acid present as esters in given oil/fat. Saponification value of Sukumar Ghrit without Murchhana is more than Murchhit Ghrit and Murchhit Sukumar Ghrit.

**Iodide value**
Iodine value indicate the degree of unsaturation of ghrit. Greater the degree of unsaturation greater will be possibility of ghrit becoming rancid due to atmospheric oxidation. Analytical parameters have shown increase in iodine value of Amurchhit Sukumara Ghrita.

**Loss on drying at 105°C**
It is indicative of moisture content of the preparation. The higher the value more will be the amount of moisture and ghee will be more susceptible for rancidity. The moisture content should be minimized in order to prevent decomposition of medicament due to chemical change or rancidity. All values of moisture content are very less which considered as negligible. Loss on drying value of Sukumara Ghrita prepared with Amurchita Ghrita (unprocessed ghee) was more than Sukumara Ghrita prepared with Murchita Ghrita (processed ghee).
Viscosity
Viscosity of Sukumara Ghrita prepared with Murchita Ghrita (processed ghee) was decreased after Murchana process is due to the addition of Drava Dravya (liquid materials) like water, milk, etc. as these are less viscous than Ghrita (ghee).

Ester value
Saponification value- acid value. Esters are the fatty acids with glycerol. As the esters are increased rancidity chance is decreased. Ester values of Sukumara Ghrita prepared with Murchita Ghrita (processed ghee) was increased after Murchana process indicating the less chances of rancidity.

Rancidity
Three samples of Ghrita (ghee) have not shown any rancidity, which shows the presence of tocopherols as natural antioxidant. Oxidative rancidity arises from the decomposition of peroxides. Peroxides are the result of the oxidation of unsaturated fats. The products resulting from the decomposition of peroxides include aldehydes, ketones and hydrocarbons. These help to produce the flavours and odours associated with oxidative rancidity. The abnormal characteristics of a product that has undergone oxidative rancidity are paint like or acrid (burning) odour and an abnormal (rancid) taste. The colour of a food item is not normally changed due to this deteriorative process. The texture of a food product is not affected by the deteriorative condition.

Weight per ml
The weight per millimeter (g) is increased after the process of Murchhana which may be due to the addition of some active bioconstituents from the herbs used for murchhana which further increased after the preparation of sukumar ghrit. The weight per millimeter (g) of Amurchhit Sukumar ghrit was found less than Murchhit Sukumar ghrit. It can be presumed that due to the process of Murchhana more active principles may get dissolved in the finished ghrit leading to high therapeutic efficacy than the Amurchhit sample.

Free fatty acid
In Sukumara Ghrita prepared with Murchita Ghrita (processed ghee) it has decreased significantly. It indicates quality of ghee increases after Murchana process. The free fatty acid ratio is an important quality characteristic. The lower it is, the better the storage and shelf life
of the respective oil or fat will be. Crude pressed oils usually have a ratio of 0.1 or 3% and refined oils have 0.01 to 0.1%.

**Peroxide value**

Peroxide value analysis, kries test etc comprise the best known in the stability testing of ghrit. There was increased in the peroxide value after Murchhana processes. Value of ghrit without murchhana is less than murchhana ghrit. Thus it may be concluded that there is no more differences in the stability due to murchhana process.

**Acid value**

Acid value indicates the amount of free fatty acid presents in oil and fat. A high acid value in the ghrit may leads to early rancidity of the ghrit. Analytical parameters have shown decreased acid value in Sukumara Ghrita prepared with Murchita Ghrita (processed ghee) indicating that Murchana process has beneficial effect in refining of ghee and decrease in the degree of rancidity, reducing the toxic properties of Ghrita (ghee).

**REFERENCES**

