PHARMACEUTICO ANALYTICAL STUDY OF SINDHURADYA TAILA

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Abstract:
Background: Sindhuradya taila is a preparation mentioned in Kushta chikitsadhikara by Chakradatta as well as Bhaishajya Ratnavali. It is specifically claimed to be effective in Pama in the form of external application. Sindhuradya taila is a unique formulation with only two ingredients namely Sindhoora and Jeeraka.

Materials and Methods:
Aims & Objectives: In present study an attempt was taken to assess the quality of sindhuradyaTaila

Study Setting: ACRL SJJGMC&H Koppal, It includes Organoleptic parameters (colour, smell, appearance, taste) and physico chemical parameters (specific gravity, saponification value, peroxide value, acid value and iodine value), TLC.

Results: Results showed that all parameters were in Normal range, TLC study revealed that presence of Steroids with Rf value 0.439, 0.666, Terpenoids with Rf value 0.344, Flavonoids with Rf value 0.128, Alkaloids with Rf value 0.788, 0.901.

Conclusion: The present study reveals the Sindhuradya taila has meet all the quality control standards

Keywords: Sindhuradya Taila, Analytical parameters, Saponification value, Peroxide value, Acid value, Iodine value

Study & Article History: Sample received 15/03/2022 Study conducted in ACRL & published in AvishkaraVol 1.Issue 1. June 2022
Bhaishajya Ratnavali. It is specifically claimed to be effective in Pama in the form of external application. Sindhuradya taila is a unique formulation with only two ingredients namely Sindhoora and Jeeraka, processed in Moorchita Sarshapa taila. Sindhuradya taila contains Sindura which needs special attention during its preparation. In present study an attempt was taken to assess the quality of sindhuradya Taila. Organoleptic parameters (colour, smell, appearance, taste) and physico chemical parameters (specific gravity, saponification value, peroxide value, acid value and iodine value) were determined in order to assess the quality of the medicated oil. Thin Layer Chromatography (TLC) fingerprint was developed to asses the secondary metabolites, were determined by using standard protocol.

Objectives
1. To Prepare Sindhuradya taila as per Bhaishajy ratnnavali.
2. To do Analytical study of Sindhuradya taila.

Material & Methods:

Preparation of Sindhuradya Taila:
Sarshapa taila- 10 litre
Kalka Dravya: Jeeraka- 500gm, Sindhoora – 800gm
Drava dravya: Jala – 40 lit
Sarshapa taila moorchana is done as per Bhaishajya ratnnavali. Sarshapa taila is heated in a vessel, when it becomes hot it is taken out from fire. Moorchana drugs are added in to taila in kalka form and Drava dravya i.e water is also added in to it. The vessel is kept over fire and boiling is continued till Sneha siddha lakshana. It is filtered & stored. The Moorchita Sarshapa taila is taken in a vessel& heated. When it becomes hot it is taken out from fire and Kalka dravya namely Jeeraka & Girisindhura are added in Kalka form. Water is also added as drava dravya. The boiling is continued till Sneha siddha lakshana. It is filtered & stored.

Analytical Study of Sindhuradya Taila:
Organoleptic Characters: The oil samples were inspected visually.

Determination of Specific Gravity: A clean and dry pycnometer was weighed empty. Then it was filled with oil and weighed. The procedure was repeated using water instead of oil. The specific gravity was determined by dividing the weight of the sample in grams by the weight of the water in grams.
Specific gravity = W3-W1/W2-W1.[1]

Determination of Refractive Index: The refractive index was determined using laboratory model of Abbe’s Refractometer. The oil was placed on the dry prism surface and then sand witched between the prisms. The sample was viewed through the eyepiec. The black and white portion were adjusted to the cross wire with the help of lever. The reading was noted from the scale.

Determination of Viscosity: Viscosity is measure of fluid resistance to flow, take the sample in 250ml beaker and keep under the viscometer and get the readings of the samples.

Determination of Wt/ml: weigh an empty measuring cylinder and then it was filled with oil and weighed, the difference between these two values gives wt/ml of the sample.

Determination of Rancidity: take 1 ml of sample oil and add 1 ml of concentrated HCL mix thoroughly and add 1 ml of 1% phloroglucinol solution. Pink colour formation indicates that fat is slightly oxidized while red colour indicates that fat is definitely oxidized.

Determination of Iodine Value: Oil sample was taken in a dry iodine flask. Chloroform was added to dissolve it. After adding wjs iodine solution the stopper is close later potassium iodide is added around the stopper, the flask was kept in the dark for 30 minutes. Then 100 ml water was added to the solution then it is titrated against 0.1N sodium
thiosulphate using starch indicator near the end point. The procedure was repeated excluding the sample. Iodine value = (B-A) X 12.69 /w where B= Blank reading, A = Sample reading. W = Weight of sample in grams.

**Determination of Saponification Value:**
Oil sample was saponified with Ethanolic KOH by refluxing for 1 hr in a boiling waterbath. The solution was titrated with 0.5N HCl using phenolphthalein as an indicator. The procedure was repeated excluding the sample.

Saponification value = V x 28.05 / W, V = difference, in ml, between the titrations W=Weight of the substance in grams

**Determination of Acid Value:**
Oil was dissolved in the neutral mixture of alcohol: ether (1: 1). This mixture was titrated against 0.1 N Potassium hydroxide solution using phenolphthalein as an indicator.

Acid value = (V X 5.61) / W Where, V= Number of ml of 0.1N KOH required, W=Weight of sample in grams

**Determination of Peroxide Value:**
Oil was dissolved in mixture chloroform: glacial acetic acid (3:2). Saturated potassium iodide solution and water was added to it. After shaking, water was added. Then it was titrated against 0.01M sodium thiosulphate using starch solution, as the indicator, near the end point.

Peroxide value = 10 V / W where V = Number of ml of 0.01m Sodium thiosulphate required. W = Weight of sample in grams.

**Chromatographic Study:**
Readymade TLC plates were used with the help of capillary tube the sample is applied. Plates were kept in developing chamber containing solvent of the interest, after sometimes solvent front reached at the top of the mark line, visualization of the spots were appreciated by iodine chamber later Rf value was calculated.

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**Results & Discussion**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form</td>
<td>Liquid</td>
</tr>
<tr>
<td>Colour</td>
<td>Dark red</td>
</tr>
<tr>
<td>Odour</td>
<td>Pungent</td>
</tr>
</tbody>
</table>

Table1: Organoleptic parameters

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific gravity</td>
<td>0.957g/cm³</td>
</tr>
<tr>
<td>Weight/ml</td>
<td>0.987gm/ml</td>
</tr>
<tr>
<td>Refractive index</td>
<td>1.478</td>
</tr>
<tr>
<td>Viscosity</td>
<td>148.36mPa.s</td>
</tr>
<tr>
<td>Acid value</td>
<td>4.81mg</td>
</tr>
<tr>
<td>Iodine value</td>
<td>12.008mg</td>
</tr>
<tr>
<td>Saponification Value</td>
<td>162.30mg</td>
</tr>
<tr>
<td>Peroxide value</td>
<td>9.80meq/kg</td>
</tr>
<tr>
<td>Rancidity</td>
<td>Negative</td>
</tr>
</tbody>
</table>

Table2: Physicochemical parameters of Sindhuradya taila

The physico chemical parameters of Sindhuradya taila are shown in table 2. Specific gravity of Sindhuradya taila is 0.957 gm/cm³. Weight/ml of sample is 0.987 gm/ml. Refractive index of the sample is 1.478. Saponification value is the number of milligram of potassium hydroxide required for neutralizing the fatty acids. It is a measure of the average molecular weight of all the fatty acid present. The long chain fatty acids found in fats have low saponification value because they have a relatively fewer number of carboxylic functional groups per unit mass of the fat as compared to short chain fatty acids. In general, saponification value of plant origin oils ranging from 188-196 mg/g . However, in the present study, slight deviation was observed with saponification value 162.30 mg/g of Sindhuradya taila.

The acid value is the mass of potassium hydroxide in milligrams that is required to
neutralize one gram of chemical substance. Acid value is used to quantify the amount of acid present in an oil sample. According to the results, acid value of Sindhuradya Taila was 4.81 mg KOH / g. The peroxide value is a measure of the active oxygen in the oil and the potential to go rancid. High starting levels of peroxide values are a bad sign. According to the Sri Lanka Standards upper limit of peroxide value is 10 milliequivalents/kg for fixed oils. Peroxide value of the Sindhuradya Taila was 9.80 milliequivalents /kg. In general, peroxide levels lesser 10 milliequivalents/kg means that oil is stable with a longer shelf life. The iodine value is a measure of the degree of unsaturation in oil and could be used to quantify the amount of double bonds present in the oil which reflects the susceptibility of oil to oxidation. According to the present study, iodine value of Sindhuradya Taila was 12.008 mg/gm Rancidity in present study dark brown colour was appreciated and its negative (Non Rancid).

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Steroids</th>
<th>Terpenoids</th>
<th>Flavonoids</th>
<th>Alkaloids</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solvent front</td>
<td>6.6</td>
<td>5.8</td>
<td>7</td>
<td>7.1</td>
</tr>
<tr>
<td>Sample</td>
<td>2.9 &amp; 4.4</td>
<td>2</td>
<td>0.9</td>
<td>5.6 &amp; 6.4</td>
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<tr>
<td>Rf value</td>
<td>0.43 &amp; 0.66</td>
<td>0.344</td>
<td>0.128</td>
<td>0.788 &amp; 0.901</td>
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<tr>
<td>Reports</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

Table 3: TLC of Sindhuradya taila

TLC profile of steroids, Terpenoids, Flavonoids and alkaloids were appreciated

**Conclusion**

In conclusion present study reveals the Sindhuradya taila has meet all the quality control standards hence it is used in the treatment of skin disorders Pama it is one of the effective remedy.

**References**

4. Laxmi Naryan Gupta, Standard Analytical Parameters of Sneha Kalpana A prospective study, WJPRT, Jan 2020 Vol 9(1) P.15-20