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ANALYTICAL EVALUATION OF *KETHAKYAADI TAILA*

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Abstract: Analytical study is mandatory while doing standardization of formulations. Beauty of converting metal and poisonous minerals into therapeutic form is the speciality of Ayurveda.

Standardization is essential for *Ayurveda* formulations because different manufactures are producing medicine in their own way. *Sneha kalpana* is widely used in *Ayurveda* clinical practice for external and internal use. *Kethakyaadi taila*¹ is mentioned in *Sahasrayoga under asthi gata vata*.

Keywords: *Taila*, standardization, *Ayurveda*

Introduction

Ayurvedic system of medicine contains a lot of formulations that can be used in different clinical conditions. *Ayurvedic* formulations contain a wide variety of drugs in innumerable combinations. According to the condition, the physician can choose drugs because it is the main weapon of *vaidya* against *roga*. The action of *Ayurveda* drugs depends upon the quality of medicine, because nowadays due to scarcity of herbal medicines substitutions and adulterations are common in medicine preparations. When we are substituting or adulterating a drug in a formulation, we cannot expect the required action from that formulation. The purity of medicine is a factor that determines the medicine quality. To confirm the purity of medicine it should be thoroughly checked for analytical parameters.

Materials and methods Analytical study

Analytical study is carried out at S.D.M. Centre for Research in *Ayurveda* and Allied Sciences, Udupi.

Assessment of organoleptic characters

Organoleptic characters of *Kethakyaadi taila* noted using sensory organs.

Physicochemical analysis

1. Refractive index²:

Helps to determine the angle of refraction in the given sample of the drug

Procedure:

Placed a drop of water on the prism and adjusted the drive knob in such a way that the boundary line intersects the separatrix exactly at the center. Noted the reading. Distilled water has a refractive index of

1.33217 at 28° C. The difference between the reading and 1.3320 gives the error of the instrument. If the reading is less than 1.3325, the error is minus (-) then the correction is plus (+) if the reading is more , the error is plus (+) and the correction is minus (-) . The Refractive index of oil is determined using 1 drop of the sample. The correction if any should be applied to the measured reading to get the accurate refractive index. The Refractive index of the test samples was measured at 28° C.

2. Specific gravity³:

Procedure:

Cleaned a specific gravity bottle by shaking with acetone and then with ether. Dried the bottle and noted the weight. Cooled the sample solution to room temperature. Carefully filled the specific gravity bottle with the test liquid, inserted the stopper, and removed the surplus liquid. Noted the weight. Repeated the procedure using distilled water in place of sample solution.

3. Acid value⁴:

The acid value determines the number of mg of potassium hydroxide required to neutralize the free fatty acids.

Procedure: Weighed 2-10 g of *Kethakyaadi taila* in a conical flask. Added 50 ml of an acid-free alcoholether mixture (25 + 25 ml) previously neutralized with the 0.1M potassium hydroxide solution and shaken well. Added one ml of phenolphthalein solution and titrated against 0.1M Potassium hydroxide solution.

The endpoint is the appearance of pale pink color. Repeated the experiment twice to get concordant values.

4. Saponification value⁵ :

To determine the amount of free fatty acids in the given sample

Procedure:

Weighed 2 g of *Kethakyaadi taila* into a 250 ml Round Bottom flask fitted with a reflux condenser. Added 25 ml of 0.5 M alcoholic potash. Refluxed on a water bath for 30 minutes. Cooled and added 1 ml of Phenolphthalein solution and titrated immediately with 0.5 M Hydrochloric acid (a ml). Repeated the operation omitting the substance being examined (blank) (b ml). Repeated the experiment twice to get concordant values.

5. Iodine value⁶ :

To determine the weight of the iodine absorbed in 100 parts of the sample

Procedure:

The 0.1 g of *taila* sample was accurately weighed in a dry iodine flask. Dissolved with 10 ml of CCl₄, 20 ml of iodine monochloride solution was added. The stopper was inserted, which was previously moistened with a solution of potassium iodide and the flask was kept in a dark place at a temperature of about 17°C for 30 minutes. 15 ml of potassium iodide and 100 ml of water was added and shaken well. This was titrated with 0.1 N Sodium thiosulphate, starch was used as an indicator. The number of ml of 0.1 N sodium thiosulphate required (a) was noted. The experiment was repeated with the same quantities of reagents, in the same manner, omitting the substance. The number of ml of 0.1 N sodium thiosulphate required (b) was noted. The experiment was repeated twice to get concordant values.

6. Determination of unsaponifiable matter⁷

Procedure: ‘Weighed 5g of *Kethakyaadi taila* into the flask. Added 50 ml alcoholic KOH into the sample. Boiled gently but steadily under a reflux condenser for one hour. The condenser was washed with 10 ml of ethyl alcohol and the mixture was collected and transferred to a separating funnel. The transfer was completed by washing the sample with ethyl alcohol and cold water. Altogether, 50 ml of water was added to the separating funnel followed by the addition of 50 ml petroleum ether. The stopper was inserted and shaken vigorously for 1 minute and allowed to settle until both the layers were clear. The lower layer containing the soap solution was transferred to another separating funnel and repeated the ether extraction six times more using 50 ml of petroleum ether for each extraction. All the extracts were collected in a separating funnel. The combined extracts were washed in the funnel 3 times with 25 ml of aqueous alcohol and shook vigorously. And drawing off the alcohol-water layer after each washing. The ether layer was again washed repeatedly with 25 ml of water until the water no longer turns pink on the addition of a few drops of Phenolphthalein indicator solution. The ether layer was transferred to a tarred flask containing few pieces of pumice stone and evaporated to dryness on a water bath. Placed the flask in an air oven at 85°C for about 1 hour to remove the last traces of ether. A few ml of acetone was added and evaporated to dryness on a water bath. Cooled in a desiccator to remove last traces of moisture and then weighed.

7. Determination of peroxide value⁸ :

To determine the level of oxidation in the given sample

Procedure:

5 g of the *Kethakyaadi taila* was weighed accurately into a conical flask, added 30 ml of a mixture of 3 volumes of glacial acetic acid and 2 volumes of chloroform, added 0.5 ml of potassium iodide, allowed it to stand for 1 minute, add 30 ml of water titrate gradually with vigorous shaking with 0.1 M sodium thiosulphate until the yellow color disappears. Add 0.5 ml of starch indicator, continued the titration until the blue color disappears.

$$\text{Peroxide value} = 10(a - b)/W$$

Where W = Weight in g of the substance

8. Viscosity⁹:

Procedure: The given sample is filled in a U tube viscometer in accordance with the expected viscosity of the liquid so that the fluid level stands within 0.2 mm of the filling mark of the viscometer when the capillary is vertical and the specified temperature is attained by the test liquid. The liquid is sucked or blown to the specified eight of the viscometer and the time taken to pass the two marks is measured.

Viscosity is measured using the formula. **n1**

$$= p_1 t_1 \times n_2$$

$$P_2 t_2$$

n1 = Viscosity of the sample **n2** = Viscosity of water **t1** and **t2** – Time is taken by the sample and water to pass through the marks **p1** and **p2** – density of the sample and water

X – Specific gravity of sample x 0.9961 /specific gravity of water.

$$= X \times \text{Time for sample} \times 1.004 / \text{specific gravity of water} \times 70 \text{ sec.}$$

Results and discussion

The results obtained after assessing the organoleptic characters are tabulated

Sl.No	Parameters	<i>Kethakyaadi taila</i>
01.	Colour	Brownish red
02.	Taste	Taste of <i>taila</i>

03.	Odor	Aromatic smell
04.	Consistency	Liquid

Results of analytical study

Parameter	Results n = 3 %w/w
Refractive index	1.46967
Specific gravity	0.8908
Acid value	8.68
Saponification value	250.59
Iodine value	112.92
Unsaponifiable matter (%)	3.12
Peroxide value	0.4
Viscosity	57.86

Discussion:

Sample of *Kethakyaadi taila* subjected to various analytical tests to assess the quality. The organoleptic character of *Kethakyaadi taila* was noted using sensory organs. The color seems to be brownish, which may be due to ingredients. The taste was similar to the *taila* itself. Aromatic odor and liquid consistency were observed.

The Refractive index denotes how fast light travels through different media. A higher refractive index value means the speed of light is less in that material. Analytical study shows refractive index of Kethakyaadi taila as 1.46967. This indicates the proper extraction of active components into the tila taila media.

Specific gravity is the ratio of the density of a substance to the density of given reference material. The specific gravity of a liquid is assessed concerning water. Kethakyaadi taila is having a specific gravity of 0.8908, it is less than water, so it will float in water