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Research Article

ANALYTICAL STUDY OF BALAASHWAGANDHA TAILA

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Abstract

Ayurvedic tailas (oils) are used for variety of purposes and administered through different routes. One such oil is Balaashwagandha taila, which contains mainly bala, ashwagandha and laksha. It has antipyretic, antispasmodic, antiseptic, analgesic properties and is indicated for- fever, cough, asthma, headache, arthritis and to strengthen the muscles. In the present study, three batches of Bala-Ashwagandha Taila were prepared by referring the method described in the text Sahasrayogam. These batches were further studied organoleptically, physico-chemically as well as chromatographically for developing standards.

Keywords: Ayurvedic oil: Bala; Ashwagandha; Standardisation.

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INTRODUCTION

Ayurvedic tailas (oils) are administered internally as well as externally for therapeutic or cosmetic use. There are essentially 3 or 4 components in the preparation of the taila – one or more drava (liquid component/s), kalka (paste of herbs), sneha dravya (oleogenous component) and optionally gandha dravya (perfuming agent). One of such oil is Bala-Ashwagandha Taila which mainly contains - bala, ashwagandha and laksha.

Bala (*Sida cordifolia* Linn.) is wildly growing plant found all over India. Literally, it means strength and it helps to build muscle mass and provides energy. It is considered one of the most valuable drugs in Ayurvedic medicine. The roots, leaves and seeds are all used in medicine. Various extracts prepared from bala are used in the treatment of nervous system and urinary diseases, and in disorders of blood and bile. It has analgesic, anti-inflammatory, antistress adoptogenic activity.[1][2][3] Ashwagandha (*Withannia somnifera* (L.) Dunal) is considered to be one of the best rejuvenating agents in Ayurveda. Its roots, seeds, and leaves are used in medicines. Ashwagandha has anti-inflammatory, anti-tumor, anti-stress, antioxidant, mind-boosting, immune-enhancing properties. It is an ingredient in many formulations prescribed for a variety of musculoskeletal conditions, and as a general tonic to increase energy, improve overall health and longevity, and prevent disease in athletes, the elderly, etc.[4][5] Laksha (Lac) is one of the most valuable gifts of nature to man. It is the secretion of a tiny insect, *Laccifer lacca* .This red coloured resinous substance is considered good for bone health.

In ancient times, these tailas were prepared by the practicing physicians with due care in selection of raw drugs and processing parameters to get good quality finished products. With the advancement in science, it is learned that, not only use of quality raw materials and stringent processing parameters are sufficient but also detailed evaluation of finished product is necessary.

In the present study, three batches of Balaashwagandha taila were prepared by referring the method described in the text Sahastrayogam.[6] These batches were further studied organoleptically, physico-chemically and chromatographically for developing standards.

MATERIAL AND METHODS

Procurement of raw materials

All the ingredients were purchased from local market and foreign matter adhering to raw drugs was removed and cleaned. It was then identified macroscopically and studied for important botanical characteristics. The plant material was cleaned by blowing air, packed in polybags, and stored at room temperature in plastic containers.

The base, which was used for preparation of this taila, was murchhita tila taila (treated sesame oil) prepared inhouse as per the procedure mentioned in the Ayurvedic text.[7]

Balaashwagandha taila

Preparation of the kashaya (decoction)

Coarse dry powder of Bala, Ashwagandha, and Laksha 307g each were mixed together and boiled with 5L water. Heating was continued until ¼th of the volume remained. The whole process required about 8hrs. It was then filtered through double folded cloth.

Preparation of mastu

Curd prepared using cow’s milk was taken in a muslin cloth. It was then hanged over night and the liquid was collected in a clean and dry container. This liquid is termed mastu.

Preparation of kalka dravya

Coarse powders of following herbs, 4.8 g each, were mixed. Manjistha (Roots of *Rubia cordifolia* Linn.), Musta (dried rhizomes of *Cyperus rotundus* Linn.), Rasna (Roots of *Alpinia galanga* Linn.), Candana (heartwood of *Santalum album* Linn.), Durva (Dried fibrous roots of *Cynodon dactylon* Linn. Pers.), Sariva (Dried roots of *Hemidesmus indicus* R.Br.), Madhuka (Roots of *Glycyrrhiza glabra* Linn.), Ushira (Dried roots of *Vetiveria zizanioides* Nash.), Kushtha (Roots of *Saussurea lappa* C.B. Clarke.), Agaru (Heartwood of *Aquailaria agallocha* Roxb.), Devdaru (Heartwood of *Cedrus deodara* Loud.), Haridra (Rhizome of *Curcuma longa* Linn.), kumuda (Dried flowers of *Nymphaea alba* Linn.), Kaunti-Renuka beej (Seeds of *Vitex negundo* Linn.), Satahava (Fruits of *Anethum sowa* Roxb. Ex. Flem.), Padmakeshara (Dried stigmas of *Nymphea alba* Linn.). The powders were mixed with mastu to form smooth paste.

Preparation of the taila

In a steel vessel, 307 ml of murchhita tila taila was heated mildly. To this oil prepared kashaya and kalka dravya were added in small increments, followed by 1.23L of mastu. Heating was continued without covering the pan on a low flame. The mixture was stirred continuously to avoid carbonization of kalka. The kalka was evaluated by traditional in process quality control methods to achieve madhyama paka lakshana. The kalka at this stage formed varti and when put into fire did not produce any cracking sound. During the whole process, temperature was well below 100^0C and increased above 100^0C at the end of the process. The dehydrated oil was filtered and the prepared oil was packed in a dry glass bottle. The whole process took 10hrs, and was carried out in two days.

Analytical study of the taila

The following studies were carried out in the college laboratory.

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.

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 sandwitched between the prisms. The sample was viewed through the eyepiece. 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 Moisture content

Weighed quantity of oil was taken in a crucible, heated to 105^0C for an hour. After cooling, it was reweighed. The difference in the weight, before and after heating, indicated amount of moisture presents (loss on drying).

Determination of Iodine Value

Oil sample was taken in a dry iodine flask. Chloroform was added to dissolve it. After adding iodine monochloride solution, the flask was kept in the dark for 30 minutes. Solution of potassium iodide and water was added to it.

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Then it was titrated against 0.1N sodium thiosulphate using starch solution, as the indicator, near the end point. The procedure was repeated excluding the sample.

Iodine value = 1.269v/w
where v = difference, in ml, between the titrations and w = Weight of sample in g.

Determination of Saponifiction Value

Oil sample was saponified with 0.5N 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 g.

Determination of Acid Value

Oil was dissolved in the neutral mixture of alcohol: ether (1: 1). This mixture was titrated against 0.1 mol/l sodium hydroxide solution using phenolphthalein as an indicator.

Acid value = (v x 5.61)/w
Where, v= Number of ml of 0.1NaOH required
w =Weight of sample in g.

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 0.1M sodium thiosulphate using starch solution, as the indicator, near the end point. The procedure was repeated excluding the sample.

Peroxide value = 10 v/w
where v = difference, in ml, between the titrations and
w = Weight of sample in g.

Determination of Unsaponifiable matter

The term unsaponifiable matter refers to those substances present in oils or fats that are not saponified by alkali hydroxides and are extractable into ether.

Oil was saponified using 2M ethanolic potassium hydroxide. Contents in the flask were washed with water and extracted with ether. The ether layer was repeatedly washed with water and treated with solution of potassium hydroxide. Ether layer was further washed with water till free from alkali. Ether was distilled off and acetone was added to it. Acetone was removed by vacuum drying. The residue was further dried to the constant weight at 100° to 105°C, and weighed at room temperature.

The % of the unsaponifiable matter = 100a/w
Where a= weight of the residue
w = weight of sample

Chromatographic Study

HPTLC was performed on 10 cm × 20 cm aluminum-backed silica gel 60 F254 HPTLC plates from E. Merck (Darmstadt, Germany). Oil was digested with alcoholic KOH at low temperature for 6hrs. The solution was refrigerated and then quickly filtered. Filtrate was further concentrated.

15 µl of sample was applied to the plates as 8-mm bands, 8 mm apart and 1 cm from the edges of the plate, by means of an automatic sample applicator. The plate was developed to a distance of 8 cm in a Camag twin-trough glass chamber containing Toluene: Ethyl Acetate: Hexane (6:3:1), as mobile phase. The plates were then removed from the chamber, dried. The plates were observed under UV light, and the spots were derivatized by spraying 20% ethanolic sulphuric acid and heating to 110°C for 10 min.

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Figure 1: HPTLC Chromatogram under short UV

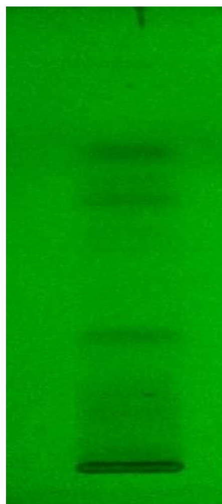

Figure 2: HPTLC Chromatogram in day light after derivatization

RESULTS

Colour	red yellow
Consistency	Liquid oily
Clarity	Clear
Odour	Characteristic
Specific gravity	0.9158-0.9178
Refractive index	1.45-1.46
Moisture content	NMT 1%
Iodine value	85-89
Saponification value	155-157
Acid value	4-5.5
Peroxide value	4-5
Unsaponifiable matter	1.7-2.1

Chromatographic Study

The HPTLC chromatogram showed major spots at Rf 0.16, Rf 0.30, Rf 0.66, Rf 0.72,Rf 0.78 under short UV and at Rf 0.30 (yellow brown), Rf 0.5 (purple), Rf 0.66 (red), 0.72 (brown-black) in day light after derivatization.

DISCUSSION

The Bala-Ashwagandha taila was prepared and studied with respect to physico-chemical and chromatographic parameters. Quality of oil may get affected due to light, heat, water,

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acid, enzymes etc. Poor quality and / or quantity of raw materials, improper manufacturing and storage conditions can be the factors responsible for it. Analytical constants such as specific gravity, refractive index, Iodine value, Saponification value, Acid value, Peroxide value, unsaponifiable matter are the useful parameters to ascertain the quality of oil. But the range of values of these analytical constants is not very narrow and may overlap with other oils. Chromatographic study provides product specific information. HPTLC technique requires small quantity of sample. It is rapid, specific and economic procedure which can be used for routine analysis of oils.

CONCLUSION

The isolation and identification of each chemical component present in the drugs and its detection in the finished products is tedious and time consuming. A comparison of overall TLC patterns will indicate the quality of the taila. The analytical data generated here may be considered for the development of standard parameters for the formulation.

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