JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue
JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)
An International Scholarly Open Access, Peer-reviewed, Refereed Journal

"A Pharmaceutico Analytical Study Of Dinesavallyadi Taila Prepared According To The Reference Of Sahasrayogam".

Shreyas S Kamath[1] Harihara Prasad Rao[2]

[1]Pg Scholar, Department of PG Studies in Rasashastra and Bhaisajya Kalpana, Karnataka ayurveda medical college Mangalore, Karnataka, India.

[2]HOD and Professor, Department of PG Studies in Rasashastra and Bhaisajya Kalpana, Karnataka ayurveda medical college Mangalore, Karnataka, India.

ABSTRACT

In *Ayurveda, Bhaisajya Kalpana* is a branch that deals with herbal preparation and their method of usage. *Sneha Kalpana* is one such fatty preparation where transformation of the active therapeutic properties of the ingredients to the solvents. *Sneha Kalpana* is a group of Medicated *Ghrita* and *Taila* preparations. *Ghrita, Taila, Vasa* and *Majja* are called *Chatursnehas*[1] in which *Taila* is best in pacification of *Vata* without aggravating *Kapha*[2]. *Sneha Kalpana* is the preparation prepared by using 1 Part of *Kalka Dravya*, 4 Parts of *Taila (Sneha Dravya)* and 16 parts of *Drava Dravya.* The mixture is boiled in mild to moderate heat till *Sneha Siddhi Lakshana* is attained[3]. *Dinesavallyadi Taila* was methodically prepared and the analytical study of the same was done.

KEYWORDS: Pharmaceutical, Analytical, Dinesavallyadi Taila.

INTRODUCTION:

In *Bhaishajya Kalpana, "Sneha Kalpana"* is one among the important concept. The word *"Sneha Kalpana"* comprises of two words *'Sneha'* and *'Kalpana'*, where *Sneha* means fats or fatty materials and *Kalpana* stands for pharmaceutical process of medicaments. *Sneha Kalpana* may be defined as - 'A pharmaceutical process to prepare oleaginous medicaments from the substances like *Kalka, Kwatha* and *Drava dravyas,* in specific proportions by subjecting to a mild to moderate heating pattern for a specific duration to fulfil

certain pharmaceutical parameters. This process ensures absorption of the active therapeutic properties of the ingredients used. *Sneha Kalpana, an Upkalpana* of both *Kashaya Kalpana and Kalka Kalpana,* is the process where the active principles of the drug are absorbed into the *Sneha* (Ghee or Oil).

Sneha is used in 4 types- *Sarphi (Ghee), Taila (Oil), Vasa (Fats), Majja (Bone Marrow)*[1].

Taila Kalpana is one among *Sneha Kalpana* where *Tailas* are prepared by boiling *Taila (Tila Taila / Sarshapa Taila)* with prescribed quantity of *Kashaya* and *Kalkas* of Drugs in specific proportion[3]. This ensures the absorption of active therapeutic principles of the ingredients used. The *Taila* will have the odour and Taste of drugs used. The *Taila* slightly gets thicker when cooled. The prepared *Taila* is preserved in Air tight containers.

An effort was made to Prepare *Dinesavallyadi Taila* methodically as mentioned in *Sahasrayogam*[4] and analytical Study was done to standardise the same.

AIMS AND OBJECTIVES:

- To Prepare *Murchitha Taila* as per classical reference.
- To Prepare *Dinesavallyadi Taila* as per classical reference.
- To Analyse the prepared *Dinesavallyadi Taila*.

MATERIALS AND METHODS

Sneha Kalpana is a group of products of medicated *Ghrita and Taila*. It is only *Kalpana* which is used through all four routes of administration such as *Pana, Abhyanga, Nasya* and *Basti.*

In this part of the study, the detailed description regarding various practical steps done for preparation of *Dinesavallyadi Taila* as per classical reference.

Drug Preparation:

Collection of Raw Materials:

The ingredients used for *Murchana of Taila* and the *Dinesavallyadi Taila* was collected from the local markets of Mangalore city. It was further identified as genuine by the *Dravyaguna* Department of Karnataka Ayurveda Medical College Mangalore.

Murchitha Taila* Preparation*:

➢ *Murchitha Taila* was initially prepared by powdering the ingredients such as *Manjista, Haridra, Lodhra, Musta, Nalika, Amalaki, Haritaki, Vibitaki, Ketaki, Vatankura, Hribera* into fine powder and then mixing all of them to prepare *Kalka* with quantity sufficient water.

- One litre of *Tila Taila* and Four litres of *Jala* was taken in a large vessel and subjected to mild fire.
- Later on, the *kalka* was added and stirred continuously for a day.
- When *Paka Siddhi Lakshana* was noted the fire was lit off and allowed to cool.

Preparation Of *Dinesavalli Kwatha:*

Preparation of *Dinesavalli Kwatha* is as per mentioned in *Sneha Kalpana* of *Sharanghadara Samhita*[5].

One part of *Dinesavalli* in coarse form is boiled in 16 parts water and reduced to 1/4th part and filtered using Kora cloth. The filtrate is taken for preparation of *Dinesavallyadi Taila* instantly.

Dinesavallyadi Taila Preparation:

- *After preparing Kwatha, Dinesavallyadi Taila* was prepared by powdering the *Kalka Dravyas* - Dinesavalli *and Punarnava into course powder* these were mixed to prepare *Kalka* with quantity sufficient water.
- 1 part of obtained *Murchita Tila Taila* and 4 parts of prepared *Dinesavalli Kwatha* was taken in a large vessel and subjected to mild fire.
- Later the *Kalka* prepared was added and Stirred for a day on mild fire.
- When *Paaka Siddhi Lakshana* was noted, the fire was lit off and *Taila* was allowed to cool and *Taila* was Filtered with Kora Cloth.

OBSERVATION:

- During the process of *Dinesavallyadi Taila* preparation, Aromatic odour was observed.
- Colour of *Taila* changed to reddish black.
- Odour of *Murchita Tila Taila* was absent.
- While preparing *Taila* a small quantity of *Kalka* taken out at the end of *Snehapaka* and rolled in between the fingers to attain a wick-like shape and does not produce any cracking noise if placed on fire.
- Appearence of froth at the end of *Taila Murchana* is observed.

ANALYTICAL STUDY

Refractive index:

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 centre. Noted the reading. Distilled water has a refractive index of 1.3320 at 30˚C. The difference between the reading and 1.33194 gives the error of the instrument. If the

reading is less than 1.33194, the error is minus (-) then the correction is plus (+) if the reading is more, the error is plus (+) and the correction is minus (-). 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. Refractive index of the test samples was measured at 30˚C.

Specific gravity:

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.

Viscosity:

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 height of the viscometer and the time taken for the sample to pass the two marks is measured. Viscosity is measured using the formula.

$$\eta 1 = \frac{\rho 1 t 1 \text{ X } \eta 2}{\rho 2 t 2}$$

η1 – Viscosity of sample

η2 - Viscosity of water

t1 and t 2- time taken for the sample and water to pass the meniscus

ρ1 and ρ2 – Density of sample and water

X= Specific gravity of sample x 0.9961/specific gravity of water

Π= X x Time for samplex1.004/specific gravity of waterx70sec

Acid value:

Weighed 2- 10g of *Dinesavallyadi taila* in a conical flask. Added 50 ml of acid free alcohol-ether mixture (25 +25ml) previously neutralised with the 0.1M potassium hydroxide solution and shaken well. Added One ml of Phenolphthalein solution and titrated against 0.1M Potassium hydroxide solution. End point is the appearance of pale pink colour. Repeated the experiment twice to get concordant values.

Saponification value:

Weighed 2g of the *Dinesavallyadi taila* into a 250 ml RB flask fitted with a reflux condenser. Added 25ml of 0.5M 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.

Iodine value:

0.1g *Dinesavallyadi taila* was accurately weighed in a dry iodine flask. Dissolved with 10ml of CCl_4, 20ml of iodine monochloride solution was added. Stopper was inserted, which was previously moistened with solution of potassium iodide and flask was kept in a dark place at a temperature of about 17^0 C for 30 min. 15ml of potassium iodide and 100ml of water was added and shaken well. This was titrated with 0.1N Sodium thiosulphate, starch was used as indicator. The number of ml of 0.1N 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 0.1N sodium thiosulphate required (b) was noted. The experiment was repeated twice to get concordant values.

Determination of Unsaponifiable matter:

Weighed 5g of the *Dinesavallyadi taila* into the flask. Added 50ml alcoholic KOH into the sample. Boiled gently but steadily under reflux condenser for one hour. The condenser was washed with 10ml 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, 50ml of water was added to the separating funnel followed by an addition of 50ml petroleum ether. The stopper was inserted and shaken vigorously for 1 minute and allowed it 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 50ml 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 25ml of aqueous alcohol and shaked vigorously. And drawing off the alcohol-water layer after each washing. The ether layer was again washed repeatedly with 25ml of water until the water no longer turns pink on 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.

Peroxide value:

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

Peroxide value= 10(a-b)/W

Where W= weight in g of the substance

Determination of pH:

Preparation of buffer solutions:

Standard buffer solution: Dissolved one tablet of pH 4, 7 and 9.2 in 100 ml of distilled water.

Determination of pH: 1 ml of sample was taken and make up to 10 ml with distilled water, stirred well and filtered. The filtrate was used for the experiment. Instrument was switched on. 30 minutes time was given for warming pH meter. The pH 4 solution was first introduced and the pH adjusted by using the knob to 4.02 for room temperature 30°C. The pH 7 solution was introduced and the pH meter adjusted to 7 by using the knob. Introduced the pH 9.2 solution and checked the pH reading without adjusting the knob. Then the sample solution (1%) was introduced and reading was noted. Repeated the test four times and the average reading were taken as result.

Rancidity test:

1ml of melted fat was mixed with 1ml of conc. Hcl and 1ml of 1% solution of phloroglucinol in diethyl ether and then mixed thoroughly with the fat acid mixture. A pink colour indicates that the fat is slightly oxidized while a red colour indicates that the fat is definitely oxidized.

Sample preparation for HPTLC:

Sample obtained in the procedure for the determination of unsaponifiable matter is dissolved in 10 ml of chloroform this was followed for the sample of Dinesavallyadi taila, and chloroform soluble portion was used for HPTLC.

HPTLC:

3, 6, 9µl of the chloroform fraction of samples of *Dinesavallyadi taila* was applied on a precoated silica gel F_{254} on aluminium plates to a band width of 8mm using Linomat 5 TLC applicator. The plate was developed in Toluene – Ethyl acetate (9:1) and the developed plates were visualized under short UV, long UV and after derivatisation in vanillin-sulphuric acid spray reagent and scanned under UV 254nm, 366nm and 620nm (Post derivatisation). Rf, colour of the spots and densitometric scan were recorded.

Table 1. Results of standardization parameters

Parameter	***Results n = 3 %w/w***
	Dinesavallyadi taila
Refractive index	1.46867
Specific gravity	0.9002
Viscosity ($kgm^{-1}s^{-1}$)	0.97

Acid value	7.82
Saponification value	12.13
Iodine value	126.90
Unsaponifiable matter (%)	1.08
Peroxide value	0.00
pH	6.0
Rancidity	Not oxidised

DISCUSSION ON DRUG REVIEW:

The compound formulation *Dinesavallyadi Taila* is taken from *Sahasrayogam* which has three main ingredients *Tila Taila, Dinesavalli* and *Punarnava.*

1) *Tila Taila: Tila taila* is one of the plant origin oil extracted from Sesamum indicum, Linn. *Acharya Sushruta* has admired *Tila taila* as one among the best amongst herbal oils (*Shresta*). It is one among the *Chatursneha* and has *Samskaraanuvarti* property which creates good medium for absorption of drug in the area of *Vrana* when externally applied. It is rich in Vitamin E along with Vitamin K, magnesium, copper, calcium, iron, zinc and Vitamin B6, hence acts as natural antioxidant. Vit K keeps epithelial tissue of the body intent and linolenic acid in *Tila Taila* helps in granulation. Moreover, *Tila Taila* possess *Vatahara, Pitta Shaamaka, Ropaka* and *Twachya* properties which are very crucial for the wound healing process. For the preparation of *Dinesavallyadi Taila*, *Murchita Tila taila* was used as the base because of the wound healing properties of *Manjista, Haridra*, *Lodhra*, *Musta*, *Nalika*, *Amalaki*, *Haritaki*, *Vibitaki*, *Ketaki, Vatankura*, *Hribera*, that are used for *Murchana* of *Tila Taila.*

2) *Dinesavalli:* Also known as *Raktavalli* or a Red Creeper in general is a thick branched climber, woody in nature found commonly across India. It is large with thick and woody spread. The bark of the creeper is what is precious in field of *Ayurveda*. It is commonly called as *Ratanjot* all over the country. A lot of controversies regarding the Botanical variety of *Dinesavalli. Ratanjot* is Ventilago Maderspatana Gaertn. But few opine Alkanna Tinctoria Taisch. And Ventilago Denticulata as the varieties too. It is *Kashaya, Laghu* in nature and *Kapha pitta Shamaka*, therefore it acts as *Vrana Ropaka, Varnya*, *Twakdoshahara* and *Deepaka. Dinesavalli* is the blessing for those with acute and chronic wounds as it has *Kashaya rasa* and balances *Kapha* and *Pitta Doshas*. It is also used to increase skin complexion.

3) *Punarnava: Punarnava* is known as Hogweed and botanical name is Boerhaavia Diffusa Linn. It is an indigenous plant with numerous medicinal properties. It is a diffusely branched herb, The aerial roots of the plant dry up in summer and regenerates in the rainy season, hence the name *Punarnava* means "becomes new again". It is *Madhura, Tikta*, *Kashaya* in nature and *Vata kapha shamaka* and best *Shotahara.* The leaves and roots of *Punarnava* have antibacterial property that make it an excellent candidate to reduce bacterial infections caused due to both Gram- positive and Gram-negative bacteria. It also has anti-inflammatory action and reduces swelling. All these properties make enhance its wound healing action.

DISCUSSION ON PHARMACEUTICAL STUDY:

1) Procurement and identification of raw drug:

The raw drugs required for the study was procured from the local market in bunder in Mangalore city. It was again verified by the Department of Dravyaguna, Karnataka Ayurveda Medical College Mangalore.

2) Preparation of *Dinesavallyadi Taila*:

Dinesavallyadi Taila is prepared based on the common preparation method as mentioned for *Taila* in *Sneha Kalpana*. *Murchana* of *Tila Taila* is done prior to preparation of the medicament and same *Murchita Taila* is used as *Sneha Dravya. Dinesavalli Kwatha* is prepared as per standard *Kwatha* preparation method mentioned in *Sharanghdara Samhita. Kalka* is prepared using *Punarnava* and *Dinesavalli.* General method for proportion of *Kalka: Sneha Dravya: Drava Dravya* is 1:4:16. The Quantity of *Kalka Dravyas* depending on different *Drava Dravya* used, Harder the drug more time is required for the water molecule to act upon, hence there will be more ratio of water. In case of *Jala, Kwatha* and *Rasa* the *Kalka* quantity will be ¼th, 1/6th and 1/8th respectively. The preparation is assessed based on mainly three types of *Sneha Paka* and Five types of *Sneha Siddhi Lakshana*. Quality and Quantity of lipid soluble extract of medicinal ingredients varies, as per methods, types of material and ratio of material with reference of *Sneha Dravya*. That is the reason behind mentioning of different types of *Sneha Paka* in classical texts of *Ayurveda*. Classically Tailas are having longer shelf life when compared to other dosage forms of medications and it can be used by all four modes of administration i.e., *Pana, Abhyanga, Basti* and *Nasya*. So *Dinesavallyadi Taila* of *Sneha Kalpana* is taken up for the study and prepared classically.

CONCLUSION:

- The study can be concluded based on the critical analysis of literary data and the analytical results of prepared *Taila.*
- To Achieve this *Sneha Kalpana* concept is taken into consideration.
- This *Kalpana* ensures absorption of active therapeutic principles of the ingredients used.
- Taila Murchana was done before preparation of Dinesavallyadi Taila
- The prepared *Dinesavallyadi Taila* was subjected to various analytical tests.
- The sample was standardised as per standard testing protocol and the results of the standardisation parameters are depicted in respective tables.

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