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Research Article

PHARMACEUTICAL AND ANALYTICAL STUDY ON *ARANALADI TAILA*

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ABSTRACT

Rasashastra and Bhaishajya Kalpana is the branch of Ayurveda which deals with the preparation of herbal (*Kashtoushadhis*), mineral (*Rasoushadhis)* and herbomineral preparations. *Bhaishajya Kalpana* is a specialized branch which deals with the identification, collection, processing compounding and dispensing of Ayurvedic formulations. It comprises various dosage forms. *Sneha Kalpana* is a variant of *Oushada Kalpana* in which *Sneha paka* is performed using prescribed *Kalka dravya* and *Drava dravya* It includes *Ghrita Kalpana* and *Taila Kalpana*, among them *Taila Kalpana* is an important dosage form widely used in Ayurvedic industry. *Aranaladi taila* is an effective oil preparation mentioned in *Sahasrayoga Taila prakarana,* which contains *Kanji, Tila taila* and *Sarjarasa.* The term *Aranala* represents *Kanji,* which is the fermented form of rice water. By this process absorption of therapeutic active principles of the ingredients are ensured. In this formulation *Kanji* is the *Dravadravya, Sarjarasa* is the *Kalka* and *Tilataila* is the *Sneha dravya*. *Aranaladi taila* is indicated in *Vatarakta* associated with *Jwara, Daha* and *Vedana.* In the present study, an attempt was made to validate the pharmaceutical preparation of *Aranaladi taila*. The current study included a detailed pharmaceutical process and physico-chemical evaluation of *Aranaladi taila.* The physicochemical parameters included are Refractive index- 1.474, Acid value- 4.4, Iodine value- 97.4, Saponification value- 179.5 and Loss on drying- 0.40%w/w. HPTLC analysis revealed the variable number of spots, however, due to the absence of a standard marker compound the chemical constituent could not be identified.

INTRODUCTION

Rasashastra and *Bhaishajya Kalpana* is one of the important branch of Ayurveda which deals with the preparation and scientific validation of *Rasoushadhis* and *Kashtoushadhis* for therapeutic purposes. The processing and preparation of herbal drugs and formulation comes under *Bhaishajya Kalpana. Bhaishajya Kalpana* encompasses a plethora of methods to transform medications into a more effective, pleasant-tasting, stable, and patient-friendly form.

It is based on *Panchavidha Kashaya Kalpana* concept, which states that the five basic forms of formulation are the primary *Kalpanas* (*Swarasa, kalka, Kwatha, Hima, Phanta*) and the secondary *Kalpana* (*Sneha Kalpana, Sandhana Kalpana, Churna, vati, Leha* etc).

Sneha Kalpana is defined as a pharmaceutical process of preparing oleaginous formulations from components such as *Kalka, Sneha* and *Dravadravya* in a fixed proportion by subjecting them to a heating process[1]. *Sneha Kalpana* can be divided into two main *kalpanas* i.e., *Ghrita Kalpana* and *Taila kalpana*. Among that *taila Kalpana* is widely used in both internal administration and external applications. *Aranaladi taila* is mentioned in *Sahasrayoga taila prakarana*[2]. The same reference is also mentioned in *Ashtanga hridaya Vataraktha chikitsa*[3], and *Charaka samhitha Vataraktha chikitsa*[4]. In the *Sloga* it is said that the *Taila* is "*Jwaradaharthinut param*" which indicates it is very useful in *Vatarakta* conditions associated with fever, burning sensation and pain. It is a simple combination of *Pithahara* drugs. Here *Tila taila* acts as the base, and the other two ingredients are *Sarjarasa* and *Kanji*. The present study aimed to prepare *Aranaladi taila* according to the standard operative

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procedure mentioned in *Sahasrayoga* and to conduct its analytical study.

AIMS AND OBJECTIVES

Aim: The proposed research aimed to develop the physico chemical parameters of *Aranaladi taila.*

Objective: The present study was carried out with the following objectives.

1. To prepare *Aranaladi taila* as per the method mentioned in *Sahasrayoga* under proper SOP.
2. To develop the analytical profile of *Aranaladi taila.*

MATERIALS AND METHODS

Step 1: Procurement and identification of raw materials

The drug was purchased from the local market in Kannur and authenticated by the experts from the department of *Dravyaguna,* Government Ayurveda College, Kannur.

Method

The method followed for the preparation of *Aranaladi taila* is the reference taken from *Sahasrayoga taila prakarana*

Pharmaceutical Processing

Step 2: Preparation of *Aranaladi taila*

The preparation of *Aranaladi taila* was done at Department of *Rasashastra* and *Bhaishajya Kalpana* lab of Government Ayurveda College, Kannur, Pariyaram. The preparation was done in two phases:

Preparation of *Aranala*

Preparation of *Aranaladi taila*

Preparation of *Aranala*

Aranala was prepared as per the traditional method followed in Kerala. Rice water was collected and kept for fermentation for a period of 5 days.

Preparation of *Aranaladi taila*

Apparatus: Pounding machine, sieve, gas stove, clean fine cloth, spatula, steel vessel, ladle

Table 1: Ingredients of *Aranaladi taila*[2]

S.no	Ingredient	Quantity
1	*Sarjarasa* (*Veteria indica*)	91gm
2	*Kanjika* (sour gruel)	1600ml
3	*Tila taila* (sesame oil)	400ml

Method of preparation

400ml of *Tila taila* was taken in a clean dry steel vessel and heated in *Mandagni*. To that, 1600ml of properly filtered *Kanji* was added and heating was continued in *Mandagni* for 5 days up to *Khara paka*. As the *Taila* is mentioned for external application the *Paka* was carried out till the attainment of *Kharapaka*[5]. As *Kanji* is mentioned as *Dravadyava*, the *Sneha paka* duration was carried out in 5 days[6]. After attaining *Khara paka* the *Taila* was filtered through a clean dry cloth into a beaker containing finely powdered *Sarjarasa.* Here *Sarjarasa* was added as *Patrapaka.* The mixture was thoroughly mixed and stored in a clean dry airtight container.

Precaution

The vessel used for the process should be clean and of adequate size to avoid spilling of *Taila.*

Throughout the procedure, *Mandagni* should be maintained.

To avoid sticking of materials continuous stirring should be done.

A clean cloth should be taken for filtration.

Taila should be filtered as soon as *Kharpaka* is attained, so that mixing of *Sarjarasa* with *Taila* becomes much easier.

Fig 1: Ingredients of *Aranaldi taila*

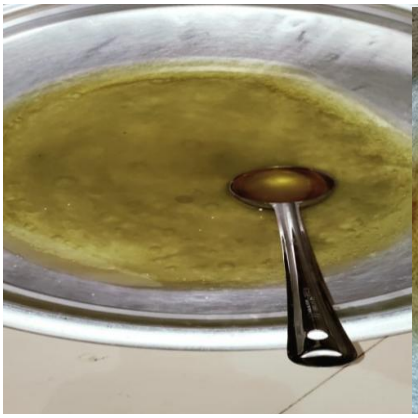
(a)*Kanji*

(b) *Tila taila*

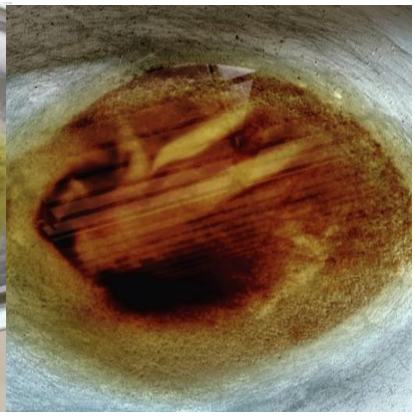
(c) *Sarja rasa*

Fig: 2. Preparation of *Aranaladi taila*

(a) Adding of *Kanji*

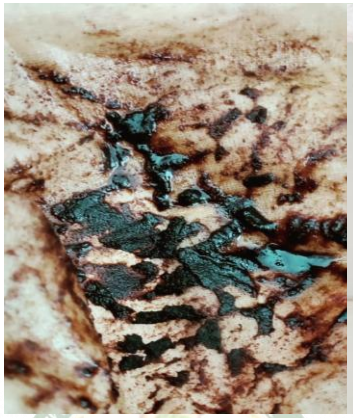


(b) 1st day of preparation

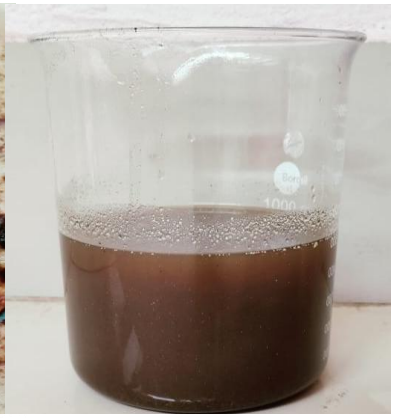


(c) After 5th day of preparation

(d) Filtering of *Taila* to *Sarja*



(e) Resultant *Kalka*



(f) Final product

Analytical Study

Analytical profiling of *Aranaladi taila* was carried out to develop basic standards. The prepared *Aranaladi taila* was analyzed with the help of sense organs to evaluate its organoleptic parameters. These are colour, taste, odour, texture, touch, and clarity[7]. The physico-chemical parameters such as acid value, iodine value, refractive index, saponification value, loss on drying and HPTLC of *Aranaladi taila* samples were done at the Qc lab of Arya Vaidhya Sala, Kottakkal. The table below presents the findings of *Taila*.

RESULTS

Table 2: Organoleptic characters of *Aranaladi Taila*

S.no	Physical test	*Aranaladi taila*
1	Colour	Dark brown
2	Taste	-
3	Odour	Characteristic
4	Texture	Viscous
5	Touch	Unctuous
6	Clarity	Translucent

Table 3: Analytical study of *Aranaladi taila*

S.no	Test parameter[8]	Result
1	Loss on drying	0.40%w/w
2	Acid value	4.4
3	Iodine value	97.4
4	Saponification value	179.5
5	Refractive index	1.474

HPTLC analysis of *Aranaladi Taila* Sample[9]

Sample details

Sample name – *Aranaladi taila*

Test solution

10 gm *Aranaladi taila* sample is taken, extracted with 10ml methanol and spotted as 10 microlitre.

Stationary phase

Merk, 1.05554.0007, TLC silica gel 60 $f_{254,}$ 10x10cm aluminium sheet.

A. Mobile phase

Toluene: Ethyl acetate: Formic acid: Methanol (7:5:1:0.5)

B. Development

Camag 10 x 10cm twin trough chamber.

C. Hptlc instrumentation

Camag linomat 5, Camag tlc scanner 3, Camag reprostar 3.

D. Derivatization

Iodine reagent

Fig 3: Overview graph of *Aranaladi taila* sample at 254nm

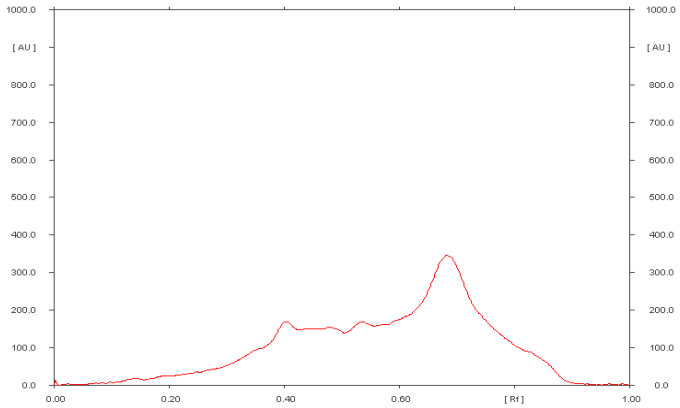


Fig 4: Overview graph of *Aranaladi taila* sample at 366nm

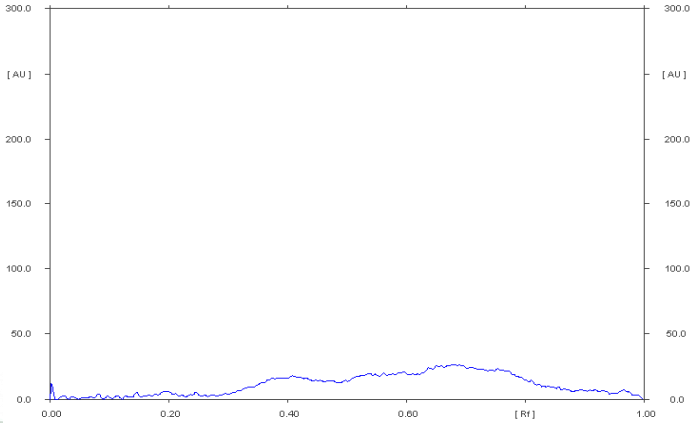
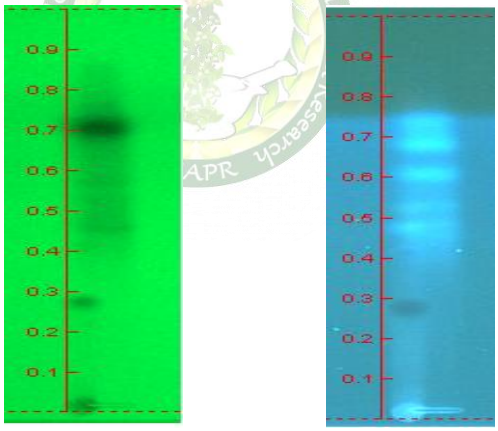
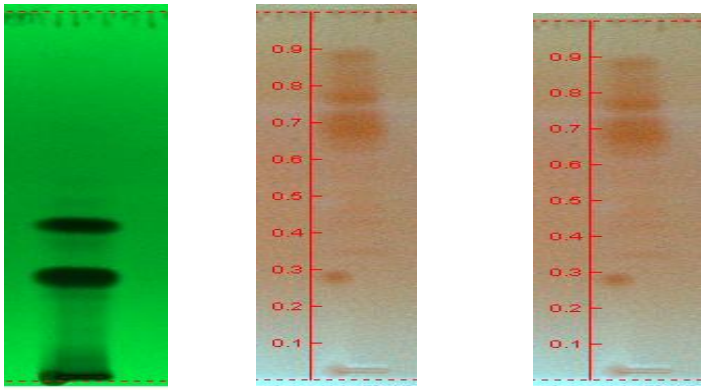


Fig 5: TLC plate views of *Aranaladi taila* sample



At 254nm At 366 nm

Fig 6: Derivatized TLC plate views of *Aranaladi taila* sample



At 254 nm **At 366 nm.** **At white light**

Table 4: Rf Value & % Area of *Aranaladi Taila* Sample at 254nm

Peak No.	Rf Value	Area (AU)	% Area (AU)
1	0.15	120.9	0.49
2	0.25	57.6	0.23
3	0.40	1058.8	4.28
4	0.48	241.4	0.98
5	0.54	372.8	1.51
6	0.68	22868.9	92.51

Total peak no – 06

Total area – 24720.4 (AU)

Table 5: Rf Value & % Area of *Aranaladi Taila* Sample at 366nm

Peak No.	Rf Value	Area (AU)	% Area (AU)
1	0.39	612.1	42.36
2	0.75	832.9	57.64

Total peak no – 02

Total area – 1445.0 (AU)

DISCUSSION

There has been a lot of uproar regarding the manufacturing of Ayurvedic formulations. Also, there is confusion about the preparation of various dosage forms. In this scenario, there is a need to develop a pharmaceutico analytical profile for Ayurvedic formulations. This is proof of scientific validation. In the current study, an attempt has been made to prepare *Aranaladi taila* as per classical reference and to develop the analytical parameters for the same.

Aranaladi taila is a well-known formulation mentioned in the context of *Vatarakta* by *Acharya Vagbhata* for *Bahya prayoga* and the same reference is mentioned in *Sahasrayoga* and *Charaka Samhita*. *Bahya prayoga* of *Aranaladi taila* enables percutaneous absorption of ingredients present in the formulation. This preparation is meant to be used in the condition of *Vatarakta* associated with *Daha* and *Jwara. Aranaladi taila* contains only *Tilataila, Sarjarasa* and *Kanjika* so it can be easily prepared and is cost-effective too. The raw materials for the preparation of *Aranaladi taila* were purchased from the local market in the Kannur district and were prepared with *Tila taila.* AGMARK standard *Tila taila* was purchased to assure the quality. In classics, we can observe various references for the preparation of *Kanjika.* So in this study *Kanjika* was prepared as per traditional method i.e., the rice water was collected and kept undisturbed for 5 days to attain fermentation.

Tila taila was taken in a wide wide-mouthed vessel and slightly heated. Then kanji was slowly added to the *Taila*. A crackling sound along with slight bubbling was observed with the addition of *Kanjika*. As *Kanjika* was added as *Drava dravya* heating was continued over mild flame for 5 days. On 2rd day light brown colored *Kalka* started to appear on the bottom of the vessel. Heating was continued till *Khara paka* as this *Taila* is indicated for external application. *Kalka* was examined at regular intervals. *Mridu paka* stage was observed after heating for 3 days. *Kalka* attained *Madhyama paka* on the 4th day and the colour changed from light brown to dark brown. The *Kalka* was heated further until the consistency changed to sand-like and the colour turned brownish black. Heating was stopped at *Khara paka* and filtered through a clean dry muslin cloth into a beaker containing finely powdered *Sarja rasa*. Mixing was done thoroughly to ensure proper dissolving of *Sarja rasa* into the *Taila.* The final product was stored in a clean dry glass container. Then it was subjected to organoleptic and physico-chemical evaluation.

The refractive index is the density of the sample compared to air and liquid media. There is a higher chance of spoilage due to oxidation when the refractive index is high. The refractive index of good quality *Tila taila* is 1.465. The refractive index of *Aranaladi taila* was found to be 1.474 which is somewhat similar to the RI of raw *Tilatailam*.

The acid value is one of the important parameters related to oil's quality, indicating the presence of free fatty acids in the oil which is responsible for the compounds' rancidity. The higher the fatty acid more will be the rancidity. Higher acid value also results in the deterioration of oil; hence it helps to assess the shelf life of the compound. The acid value of *Aranaladi taila* was found to be 4.4.

The amount of remaining water in the finished product is indicated by loss on drying. The loss on drying at 105°C of *Aranaladi taila* was found to be 0.40%w/w. This value indicates the quantity of moisture present in the sample, which may be due to the presence of *Kanjika.*

The iodine value helps to determine the amount of instauration. Higher the iodine value, the oil will be less stable and more vulnerable to oxidation

and free radical production. The iodine value of prepared *Aranaladi taila* was found to be 97.4.

The saponification number depends on the molecular weight and the % concentration of fatty acid component present in the oil saponification value is collectively used to determine the average relative molecular mass of the oil and fat. In general, the saponification value of plant-origin oil ranges from 188-196mg/gm the saponification value of *Aranaladi taila* was found to be 179.5mg/gm. The HPTLC analysis of *Aranaladi taila* was done by extracting 10 grm *Taila* with 10ml methanol and spotted as 10 Microlitre. The Stationary phase used was Merk, 1.05554.0007, TLC silica gel 60 $f_{254,}$ 10x10cm aluminium sheet and the Mobile phase used was Toluene: ethyl acetate: formic acid: methanol (7:5:1:0.5). The analysis was done at 254 and 366nm. At 254 nm 6 peaks were observed and among them, an Rf value of 0.68 with a maximum percentage area was noted. At 366 nm 2 peaks were observed with Rf values 0.39 and 0.75 respectively. This indicates the presence of specific constituents in the *Taila.* Further advanced techniques using markers are needed for identifying the specific constituents.

CONCLUSION

Aranaladi taila is one of the commonly used yoga indicated in *Vatharakta* associated with *Daha* and *Jwara.* The method of preparation is mentioned in *Vatharakta chikitsa prakarana* of *Charaka Samhita* and *Ashtangahridaya.* The same reference is available in *Taila prakarana* of *Sahasrayoga* with this reference in the backdrop *Aranaladi taila* was prepared and subjected to physico-chemical analysis.

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