

**PHARMACEUTICO-ANALYTICAL STUDY OF ADITYAPAKA GUDUCHITAILA W.S.R TO ADITYAPAKA METHOD****Bankimchandra S. Jambagi<sup>1</sup>, Vijaykumar Chavadi<sup>2</sup>**

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**Article Received:** 01/09/2020 - **Peer Reviewed:** 08/09/2020 - **Accepted for Publication:** 08/09/2020**ABSTRACT**

**Purpose:** *Taila Kalpana* is one of *Sneha Kalpana* procedure which is widely used and mostly preferred dosage forms of Ayurvedic system of medicine. It is followed to produce an oleaginous medicament from. *Taila Kalpana* involves 2 methods viz, *Agnipakavidhi* and *Adityapakavidhi*. *Agnipakavidhi*(Heating through Fire) is a method where fire is used as source to prepare the medicine *Adityapakavidhi* (Heating through sunlight), where the preparation is subjected to intense heat from Sun rays until the *Taila Siddhi Lakshana* (Tests of perfection) are observed, *Adityapaka Guduchi Taila* is selected for study to Pharmaceutical as well as Analytical parameters the results obtained are differed as compared with *Agnipaka Vidhi Siddha Taila* due to its unique method of preparation.

**Keywords:** *Adityapaka Vidhi, Taila Kalpana, Adityapaka Guduchi Taila,***INTRODUCTION**

*Ayurveda* being ancient system of medicine having uniqueness and diversity of preparation to eradicate the diseases and also to maintain the health. *Rasashastra* and *Bhaishajya Kalpana* is the greatest contribution to Ayurveda. Acharya Charaka has described primary dosages forms i.e. *Swarasa* (Juice), *Kalka* (Paste), *Kwatha* (Decoction), *Hima* (Cold infusion) & *Phanta*

(Hot infusion) and mentioned them as *Panchavidha Kashaya Kalpana* (5 types of Primary preparations). Keeping these as the basic preparations, number of secondary preparations have been derived from these five preparations viz. *Asavarishta* (Fermentation), *Lepa* (Paste), *Churna* (Powder), *Sneha Kalpana* (Fatty preparation), *Vati* (Pills) etc *Sneha Kalpana* is well known

among them. *Taila Kalpana* is one of *Sneha Kalpana* procedure which is widely used and mostly preferred dosage forms of Ayurvedic system of medicine. It is followed to produce an oleaginous medicament from. The substances such as *Kalka*, *Kwatha*, and *Drava Dravyas*, in specific proportions by subjecting them to a specified heating pattern and duration will get converted into potent medicament. By this process, one can ensure transformation of the active therapeutic properties of the ingredients to the solvents and hence, one can recover fat-soluble as well as water-soluble chemical constituents. *Taila Kalpana* involves 2 methods 1. *Agnipakavidhi* (Heating through fire) 2. *Adityapaka-vidhi* (Heating through sunlight). *Agnipakavidhi* is a method where fire is used as source to prepare the medicine, due to its flexibility it is the most common method to prepare the most of preparations. Another one is *Adityapakavidhi*, where the preparation is subjected to intense heat from Sun rays until the *Taila Siddhi Lakshana* (Test of perfection) are observed, this kind of preparations are used only external application

purpose and very effective in Skin disorders, hair and scalp areas. this *Adityapaka Sneha* absorbs the UV rays from sun, the sun's Ultraviolet rays are made up of UVA and UVB rays. UVB rays are more effective at treating skin disorders because they penetrate more and helps for rapid skin shedding and growth<sup>1</sup>. It helps to reduce the inflammation of skin. So, the analytical study is time in need to prove the surprise results of *Adityapaka Vidhi*, *Adityapaka Guduchi Taila* is one such preparation which is mentioned in *Bhaishajya Ratnavali*<sup>2</sup> specially for *Khalitya* (Hair fall). *Adityapaka Guduchi Taila* is prepared as per the *Adityapaka Vidhi* and various analysis are done to know the efficacy of *Adityapaka Vidhi*.

### Objectives

1. Preparation and Pharmaceutical observations on *Adityapaka Guduchi Taila*.
2. Analytical Study of *Adityapaka Guduchi Taila*.

### Materials and Methods:

Pharmaceutical Study of *Adityapaka Guduchitaila*:

**Table 1:** Ingredients:

Sl.No	Drug	Latin Name and Family	Role as	Part Used	Quantity
1	<i>Guduchi</i>	<i>Tinospora cordifolia /Menispermaceae</i>	<i>Drava dravya</i>	<i>Panchanga</i>	5 Litters
2	<i>Vata</i>	<i>Ficus bengalensis /Moraceae</i>	<i>Kalka dravya</i>	Arial roots	1.25 kg
3	<i>Jatamansi</i>	<i>Nardostachys jatamansi/ Valerianaceae</i>	<i>Kalka dravya</i>	Tubers	1.25 kg
4	<i>Tila</i>	<i>Sesamum indicum /Pedaliaceae</i>	<i>Sneha dravya</i>	Seeds	5 Litters

### Steps Involved:

- Collection of the raw materials.
- Preparation of *Guduchi Swarasa*.
- Preparation of *Jatamansi* and *Vatapraroaha Kalka*.
- Mixing it with *Moorchita Tilataila*.
- Keeping in the sunlight.

**Selection and Collection of the raw materials:** Fresh Stem and leaves of *Guduchi*, Ariel's roots of *Vata* are collected from a garden, *Moorchita Tila Taila* and Roots of *Jatamansi* are procured from the BVVS Ayurveda Pharmacy, all ingredients are selected after proper authentication by experts in the *Dravyaguna* department of the institution, taken quantities are tabulated in Table No. 1.

### Preparation of *Guduchi Swarasa*<sup>3</sup> (Fig no.1 & 4):

**Ingredients:** Freshly collected *Guduchi* Plant (Stem and Leaves)

**Pre-Procedure:** Fresh *Guduchi* leaves are collected and cleaned with water, then made them into paste form by pounding in *Khalwa-yantra*, then juice is extracted by squeezing it with through a double layered cotton cloth. Thus, obtained juice is *Guduchi Swarasa*.

**Preparation of *Jatamansi* and *Vatapraroaha Kalka*<sup>4</sup> (Fig. No. 5 & 6):** Fresh wet drugs of *Vatapraroaha* and *Jatamansi* root are collected and cleaned with water and made into paste in the *Khalva-yantra*.

**Preparation of *Adityapaka Guduchi Taila*<sup>5</sup> (Fig No. 7 to 12):** In a broad mouthed stainless steel vessel, the extracted juice of *Guduchi* 1part is poured and equal

quantity of *Moorchita Tila Taila* is added after that the prepared *Kalka* of *Jatamansi* and *Vataprarooha* taken ¼th part then it is mixed homogeneously kept exposed to sunlight<sup>5</sup> and stirred frequently to facilitate the absorption of active principles of *Guduchi*, *Vataprarooha* and *Jatamansi* into the *Taila* media. After proper mixing, it is kept in a place where complete sun rays fall on that and the procedure of stirring is continued for every 1 hours so that the complete evaporation of water molecules takes place during *Aditya Pakavidhi* and *Taila Siddhi Lakshanas* are observed.

**Analytical study:** In the present study, analytical evaluation of APGT was carried out to develop preliminary standards. The samples are analysed first of all on the basis of organoleptic characters. The organoleptic characters involved the testing of samples using sensory organs. These are four subjective parameters – Colour, Odour, Taste and Form tested by the experts. Physico-chemical parameters such as Specific gravity, Refractive index, Acid value, Saponification value, Iodine value, HPTLC are done (Fig no.13 to 18).

### Observation and Results:

**Table 2:** Observations on Pharmaceutical Study

Sl. No.	Day	Observations
1.	1 <sup>st</sup> Day	On stirring Suspended <i>Vataprarooha</i> and <i>Jatamansi</i> in <i>Guduchiswarasa</i> and <i>tila taila</i> was clearly visible. Color: Light green and dark Brown color Smell: Smell of <i>guduchi Swarasa</i> and <i>Jatamansi</i> .
2.	5 <sup>th</sup> Day	Amount of fresh <i>Guduchi Swarasa</i> was reduced. Color: <i>Guduchi Swarasa</i> turned from light green color to Green color Smell: <i>Guduchi</i> and <i>Jatamansi</i> smell.
3.	10 <sup>th</sup> Day	Watery bubbles in vessel with light brown <i>Guduchi Swarasa</i> in contact with <i>Tilataila</i> . Color: brownish green color, Smell: Light pungent smell
4.	20 <sup>th</sup> Day	Water quantity reduced little bit, <i>Guduchi Swarasa</i> turned from light color to dark color Color: Brownish green color., Smell: Pungent
5.	30 <sup>th</sup> Day	Total quantity of preparation reduced to half, sticky glue-like substance forming at bottom Color: Brown color, Smell: <i>Jatamansi</i> dominant pungent smell
6.	40 <sup>th</sup> Day	Less of water, More of <i>Taila</i> in preparation, dark glue-like substance settled at bottom of the vessel Color: Brown color, Smell: <i>Jatamansi</i> dominant pungent smell
7.	50 <sup>th</sup> Day	<i>Taila</i> with thick consistency, <i>Kalka</i> stick to the bottom. <i>Shabdahino Agnikshepa</i> was Negative Color: Dark brown color, Smell: Punget smell reduced, <i>Ughragandha</i> of <i>Jatamansi</i> was started to appear.
8.	55 <sup>th</sup> Day	<i>Taila</i> with thick consistency, <i>Kalka</i> stick to the bottom. <i>Shabda Hino Agni Nikshepa</i> was Positive Color: Dark brown Color, Smell: Punget smell reduced, <i>Ugragandha</i> of <i>Jatamansi</i> persists.

**Table 3:** Showing duration of Paka, yield of APGT, and % of loss in gravimetric as well as volumetric form.

Name of <i>Taila</i>	Duration of <i>Paka</i>	Initial volume of oil in ml	Final yield of oil in ml	Initial weight of oil in gm	Final yield of oil in gm	% loss of oil in ml	% loss of oil in gm
<i>Adityapaka Guduchi Taila</i>	55 days	5200	4100	6200	5250	11%	9.5%

**Observations and Results of Analytical Study:**

**Table 4:** Organoleptic Characters of *Adityapaka Guduchi Taila*:

Sl.No	Name of Preparation	Colour	Odour	Taste	Form
1.	<i>Adityapaka Guduchi Taila</i>	Rusty Orange	<i>Jatamansi</i> odour	Bitter	Oil

**Refractive Index<sup>6</sup>(Fig. No. 13):**

The refractive index (n) of a substance with reference to air is the ratio of the sine of the angle of incidence to the sine of the angle of refraction of a beam of light passing from air into the substance. It varies with the wavelength of the light used in its measurement.

- Refractive Index of APTG: 1.4660

**Specific Gravity<sup>7</sup> (Fig. No. 14)::** Specific gravity is the specific gravity of a liquid is the weight of a given volume of the liquid at 25o (unless otherwise specified) compared with the weight of an equal volume of water at the same temperature, all weighing are being taken in air.

- Specific gravity: 0.912

**Determination of Saponification Value<sup>8</sup>(Fig. No. 17):** The saponification value is the number of mg of potassium hydroxide required to neutralize the fatty acids, resulting from the complete hydrolysis of 1 g of the oil or fat.

Formula:

$$\text{Saponification Value} = \frac{(b-a) \times 0.02805 \times 1.000}{W}$$

Where ‘W’ is the weight in g of the substance taken.

*Adityapaka Guduchi Taila:* a- 16.4., b-27.5., W-2.039 gm.

- Saponification value of *Aditya Paka Guduchi Taila:* 152.69

**Determination of Iodine Value<sup>9</sup>(Fig. No.15):**

The Iodine value of a substance is the weight of iodine absorbed by 100 parts by weight of the substance,

$$(b-a) \times 0.01269 \times 100$$

$$\text{Iodine value} = \frac{\hspace{10em}}{W}$$

*Adityapaka Guduchi Taila:* a- 27.6., b- 38.8. W- 0.251.

- Iodine Value of APTG: 56.624

**Determination of Acid Value<sup>10</sup> (Fig. No.16):** The acid value is the number of mg potassium hydroxide required to neutralize the free acid in 1 g of the substance, formula:

$$a \times 0.00561 \times 1000$$

$$\text{Acid Value} = \frac{\hspace{10em}}{W}$$

Where ‘a’ is the number of ml. of 0.1 N potassium hydroxide required and ‘w’ is the weight in g of the substance taken.

*Adityapaka Guduchi Taila:* a- 49.3., W – 5.076

- Acid Value: 54.496

**Rancidity test (Kreis Test)<sup>11</sup>(Fig. No. 17):**

The test depends upon the formation of a red colour when oxidized fat is treated with conc. HCl and a solution of phloroglucinol in ether. The compound in rancid fats responsible for the colour reaction is epihydrin aldehyde. All oxidized fats respond to the Kreis test and the intensity of the colour produced is roughly proportional to the degree of oxidative rancidity.

*Adityapaka Guduchi Taila:* Slightly Oxidised.

**HPTLC<sup>12</sup>(Fig. 18):** It was done in solvent system Toluene Ethyl Acetate, HPTLC Study of APTG shows 8 Rf value in Short UV and 5 in Long UV and 2 after derivatization.

**Table 5:** HPTLC study of APGT

Sl.No	Short UV	Long UV	After derivatisation
1.	0.08 (Green)	-	-
2.	0.31 (Green)	-	-
3.	0.35 (Green)	0.35 (F. blue)	-
4.	0.46 (Green)	-	-
5.	-	0.51 (F aqua blue)	-
6.	0.55 (Green)	-	0.55 (Purple)
7.	-	0.59 (F. blue)	-
8.	0.61 (Green)	-	-
9.	0.65 (Green)	-	0.65 (Pink)
10.	-	0.73 (F. blue)	-
11.	0.88 (Green)	0.88 (F. blue)	-

## DISCUSSION

*Adityapaka Vidhi* (Heating through sunlight) is one of the unique Pharmaceutical procedure of *Sneha Kalpana* (Oleaginous Medicament), where the uniform temperature from the Sun-rays for longer duration are utilized for the purpose of *Shena Paka* this allows volatile and High temperature non-stable active ingredients to imbibe completely into the preparation and show their clinical efficacy. Pharmaceutical study of *Adityapaka Guduchi Taila* revealed that, for complete appearance of *Taila Siddhi Lakshana* (Test of perfection) through *Adityapaka Vidhi* (Heating through sunlight) requires longer duration, as heat from the Sun is sustained and less amount of heat is utilized. Hence, that takes longer duration to evaporate total quantity of water portion from the preparation. After the preparation 11% of loss of oil in ml and 9.5% loss of oil in gms over a period of 55 days is observed and it is having strong smell of *Jatamansi* suggests imbibement of volatile principle of ingredients into the preparation. When it is analysed it has shown the color of *Adityapaka Guduchi Taila* looks as rusty orange due to long

exposure to the sunlight and presence of *Jatamansi* as one of the *Kalka Dravya*. Smell also resembles *Jatamansi*. Analytical parameters of *Adityapaka Guduchi Taila* are, Refractive Index is less and Specific gravity more, Acid Value in highly increased, Saponification value is more, Iodine value is more, Rancidity is slightly oxidized due to longer exposure, HPTLC: 8 is Rf value in Short UV and 5 in Long UV and 2 after derivatization suggests all active ingredients imbibed into the preparation with the aid of *Aditya Paka Vidhi* (Heating through sunlight).

## CONCLUSION

Study shows that *Adityapaka* (Heating through sunlight) is a Unique method of preparation which differs in all parameters of pharmaceutical as well as Analytical parameters as compared to commonly prepared *Taila Kalpana (Agnipaka Vidhi- Heating through Fire)*. It is time in need to bring light on such different pharmaceutical procedure-based medicine and clinical study on such preparation will reveals the miraculous health benefits.



**Preparation of Adityapaka Guduchi Taila (APGT):**



**Fig.1:** Guduchi Panchanga.



**Fig.2:** Vata Praroha



**Fig.3:** Jatamansi



**Fig. 4:** Guduchi Swarasa



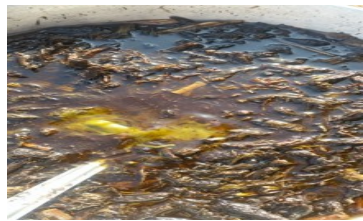
**Fig.5:** Vata Praroha Kalka



**Fig.6:** Jatamansi Kalka



**Fig.7:** Suspending Mixture;



**Fig. 8:** Constant steering.



**Fig.9:** Keeping in Sunlight for 55 days



**Fig. 10:** Collection of APGT;



**Fig.11:** Extraction of APGT



**Fig.12:** APGT Final Product

**Analytical Study:**



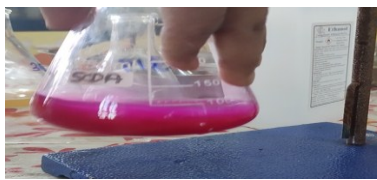
**Fig. 13:** Refractive Index Test



**Fig. 14:** Specific Gravity Test



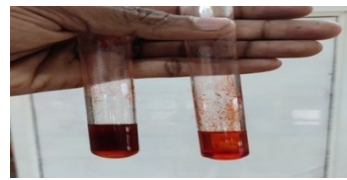
**Fig. 15:** Iodine Value Test



**Fig.16** Acid Value Test.



**Fig.17:** Saponification Test



**Fig.17:** Rancidity Test

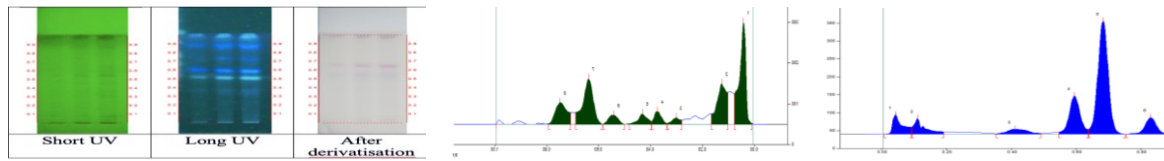


Fig.18: HPTLC and Densitometric Scan (At 254nm and 366 nm) photo Document APGT

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