

## **Process validation of *Dasha Paka Guduchi taila* with unique concept of *avartana* in the *sneha kalpana*.**

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### **ABSTRACT**

**Background:** Sneha kalpana helps to extract the fat soluble active principle from drug to sneha. Medicated taila/ghrita is one of the important dosage forms widely described in ayurvedic pharmaceuticals. The concept of avartana (process repeated again and again) has a great role in minimizing the dose of sneha (ghrita or Taila) based formulation. Medicated taila and ghrita are an important part of Ayurveda therapeutics as bahya and abhyantar Chikitsa ( Paana, Nasya, abhyang, Basti). *Guduchi taila* is described for vatrakta Chikitsa by in chakradatta.

**Aim & Objective:** The objective of the study is to prepare *Guduchi taila* by *Dasha Paka vidhi* that is to repeat the process 10 times.

**Materials and Methods:** The *Dasha paka Guduchi taila* was prepared using *Chakradatta* reference. The oil is prepared in three batches to generate the standard manufacturing procedures.

**.Results:** The oil prepared from *Dasha Paka vidhi* is Dark greenish, odour is sweetish, and having viscous consistency. The final yield was obtained in 3 batches of oil i.e 5.9, 5.8, and 5.6 from the initial quantity of 7-liter *Tila tail*. Total loss was observed in 3 bathces i.e 1.1,1.2 and 1.4. **Conclusion:** The current study reflects standardization and opens a unique concept regarding *Avartana* process.

**KEYWORDS :** *Guduchi (Tinospora cordifolia (Wild) Miers), Sneha kalpana, Avartana, Guduchi Taila, Standardization.*

## INTRODUCTION

Ayurvedic medicines are of various types based on their potency as *kwtaha, churna, avaleha, asava-aristha*, etc. *Sneha Kalpana* is one among the several highly established unique dosage forms of the Ayurvedic system of medicine. In Ayurveda, *Taila kalpana* is administered through different routes of drug administration like *Abhyanga, pana, bhojan, Nasya* and *Basti*, etc. To avoid administration of *Sneha* in large doses for a longer duration and to increase the potency of the formulation, the technique of *Avartana* was used and is well explained in various ancient ayurvedic classics. *Avartana* is a kind of pharmaceutical modification (value addition) to increase the potency or therapeutic efficacy of an Ayurvedic formulation.

The meaning of the term *avartana* is the repetition of the process of *snehapaka* in the same batch with the same ingredients without changing *sneha drava*. In the process of *avrtana*, each time the ingredients are added in *kalka/Kashaya* form. It increases extracted chemical ingredients from other ingredients of *sneha kalpana* (*kalka, Kwatha*, etc) along with the generation of newer and newer chemical moieties with successive *avartana*.

Thermogenic changes may simplify the compound of the medicaments and may help in increment in bio-availability too. Hence it may be postulated that *avartana* may help in requirement of minimum dose, increased drug absorption, early action, more drug absorption, early action, better drug distribution, good clinical efficacy, easy drug administration, biotransformation, ease packing, and marketing. In classic, *Shata paka Madhuparni taila, Dasha paka-shata paka-sahastra paka-bala taila* has been described in *charaka samhita*<sup>1</sup> and *shatapaka yastimadhu Taila*<sup>2</sup>. *Guduchi taila* is herbal preparation mentioned in *chakradutta*, which is indicated in *Vatarakta* and *Kushtha*<sup>3</sup>.

The ingredients of this medicine are *Guduchi, Ksheera*, and *taila*. Selected preparation contains, a single drug as the chief medicament ingredient of herbal origin i.e. *Tinospora cordifolia* (Wild.) Hook. F. & Thoms. *Guduchi* is mentioned as an effective drug for *Kushtha*. It

is grouped under *Panchatikta* which is found to be mentioned as effective in the treatment of *Kushtha* by many ancient texts. Hence in the present study was thus designed to prepare the *Guduchi taila* by *avartana* process and further process validation was done.

## **MATERIALS AND METHODS**

### **Procurement of raw material/collection of raw material and authentication of raw material**

Fresh *Guduchi stem* was collected from the periphery area of Jamnagar and used after authentication in the pharmacognosy department of IPGT & RA, Jamnagar. *Tila taila* (sesame oil) was obtained from the GAU Pharmacy, Jamnagar while Cow milk was purchased from Amul Parlour, Jamnagar.

### **Pharmaceutical process of Dashapaka Guduchi taila**

*Guduchi taila* was prepared as per the reference mentioned in *Chakradatta*<sup>1</sup>. *Dasha Paka Guduchi taila* was prepared by the repeated process of *taila Paka* 10 times. It is carried out in three steps; i.e Preparation of *Guduchi Kwatha*, Preparation of *Guduchi Kalaka*, Process validation of *Dashapaka guduchi taila*.

#### **Preparation of *Guduchi Kwatha***<sup>4</sup>

Principles: Kwathan ( heating and evaporation)

Ingredients: Freshly collected *Guduchi stem* 1 part & water 4 part

Procedure:

Fresh *Guduchi stem* was cut into small pieces. These pieces were added to water and heated over mild heat (80-90<sup>0</sup> c). It was prepared by reducing the amount of water up to 1/4<sup>th</sup> part of the initial quantity and after that filtered through cotton cloth.

#### **Preparation of *Guduchi kalka***

Principle: chopping & pounding

Ingredients: Freshly collected *Guduchi stem* (dia.1-1.5 cm)

Procedure:

Guduchi kalka was prepared by chopping the freshly collected washed Guduchi stem into small pieces and then converted into *Kalka* by using of wet grinder.

### **Process validation of *Dashapaka Guduchi taila***

Principle: *Sneha paka*

Ingredients: *Tila taila* 1part, *Guduchi kalka* 1/8<sup>th</sup> part, *Guduchi Kwatha* 4 part, and cow milk 1 part.

Procedure:

*Tila taila* was taken in a stainless steel vessel and heated on mild flame. After that fresh pounded *Guduchi kalka* was added to it, followed by *Guduchi Kwatha* and milk. The whole mixture was heated over mild heat (approx 85<sup>o</sup>) till complete evaporation of water content and appearance of *Madhyampaka sneha sidhi lakshana* were observed. It was filtered in its warm condition.

After the filtration of *Guduchi taila* again same procedure was repeated 9 times (Every time all the ingredients were added according to the final quantity of the previous *sneha*). For the 2<sup>nd</sup> *avartana*, the 1<sup>st</sup> *Avartit Guduchi taila* was taken in the place of *Sneha* (oil) and fresh *Guduchi Kwatha*, *Guduchi kalka*, and milk were added in the prescribed ratio. Similarly, further *Avartana* were carried by using preceding oil prepared *Avartit* as the base. The final product obtained after 10 repeated processes is called *Dasha avartita Guduchi taila*.

### **OBSERVATION & RESULTS**

*Guduchi taila* contain *Tila taila*, *Giduchi kalka*, *Guduchu kwatha* and *Godugdha*. The composition is shown in table no.1

**Table 1: Formulation composition of *Guduchi taila***

Sr.no	Ingredients	Botanical/English name	Part used	Quantity
1	<i>Tila taila</i>	<i>Sesamum indicum</i> DC.	-	1 part

2	Guduchi kalka	<i>Tinospora cordifolia</i>	Stem	1/8 <sup>th</sup> part
3	Guduchi Kwatha	<i>Tinospora cordifolia</i>	Stem	4 part
4	Godugdha	Cow milk		1 part

The composition of Guduchi taila ingredients used in 3 batches is shown in table no. 2

**Table 2: The ingredients Guduchi taila in 3 batches.**

Ingredients	Batch I	Batch II	Batch III	Average
Tila taila (l)	7	7	7	7
Guduchi kalka (gm)	875	875	875	875
Guduchi Kwatha (l)	28	28	28	28
Godugdha (l)	7	7	7	7
Final yield Guduchi taila(l)	6.8	6.9	6.85	6.85
wt of kalka after oil filtration	1.37	1.25	1.35	1.32

Organoleptic characters like colour, odour, consistency and taste is shown in table no. 3

**Table 3: Organoleptic characters of Guduchi Kwatha**

Organoleptic characters	Observation
Colour	Dark greenish
Consistency	Viscous
Odour	Bitter
Taste	Bitter

The quantity of ingredients used in preparation of Dashapaka Guduchi taila in all the 3 batches is given in table no. 4-6

**Table 4: Quantity of ingredients in Dasha paka guduchi taila ( Batch I)**

<b>Guduchi Taila paka</b>	<b>1<sup>st</sup></b>	<b>2<sup>nd</sup></b>	<b>3<sup>rd</sup></b>	<b>4<sup>th</sup></b>	<b>5<sup>th</sup></b>	<b>6<sup>th</sup></b>	<b>7<sup>th</sup></b>	<b>8<sup>th</sup></b>	<b>9<sup>th</sup></b>	<b>10<sup>th</sup></b>
Tila taila(l)	7	6.8	6.8	6.7	6.6	6.5	6.3	6.3	6.2	6
Guduchi kalka(gm)	875	850	850	837	825	812	787	787	775	750
Guduchi Kwatha(l)	28	27.2	27.2	26.8	26.4	26	25.2	25.2	24.8	24
Godugdha(l)	7	6.8	6.8	6.7	6.6	6.5	6.3	6.3	6.2	6
Final yield	6.8	6.8	6.7	6.6	6.5	6.3	6.3	6.2	6	5.9
Wt of kalka after oil filtration (gm)	1.37	1.25	1.25	1.22	1.22	1.20	1.18	1.20	1.15	1.1

**Table 5: Quantity of ingredients in Dasha paka guduchi taila ( Batch II)**

<b>Guduchi Taila paka</b>	<b>1<sup>st</sup></b>	<b>2<sup>nd</sup></b>	<b>3<sup>rd</sup></b>	<b>4<sup>th</sup></b>	<b>5<sup>th</sup></b>	<b>6<sup>th</sup></b>	<b>7<sup>th</sup></b>	<b>8<sup>th</sup></b>	<b>9<sup>th</sup></b>	<b>10<sup>th</sup></b>
Tila taila(l)	7	6.9	6.6	6.5	6.5	6.4	6.4	6.3	6.2	6
Guduchi kalka(gm)	875	862	825	812	812	800	800	787	775	750
Guduchi Kwatha(l)	28	27.6	26.4	26	26	25.6	25.6	25.2	24.8	24
Godugdha(l)	7	6.9	6.6	6.5	6.5	6.4	6.4	6.3	6.2	6
Final yield(l)	6.9	6.6	6.5	6.5	6.4	6.4	6.3	6.2	6	5.8
Wt of kalka after oil filtration (gm)	1.25	1.30	1.22	1.1	1.25	1.1	1.1	985	1.1	980

**Table 6: Quantity of ingredients in Dasha Paka guduchi taila ( Batch III)**

<b>Guduchi taila paka</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>
Tila taial(l)	7	6.85	6.66	6.5	6.5	6.4	6.4	6.3	6.2	5.9
Guduchi kalka(gm)	875	856	832	812	812	800	800	787	775	737
Guduchi Kwatha(l)	28	27.4	26.64	26	26	25.6	25.6	25.2	24.8	23.6
Godugdha(l)	7	6.85	6.66	6.5	6.5	6.4	6.4	6.3	6.2	5.9
Final yield(l)	6.85	6.66	6.5	6.5	6.4	6.4	6.3	6.2	5.9	5.6
Wt of kalka after oil filtration (gm)	1.35	1.25	1.18	900	1.1	850	950	955	1.1	1.1

**Table 7: Avarage data of 3 batches of Dasha paka Guduchi Taila**

<b>Dasha Paka guduchi taila</b>	<b>Batch I</b>	<b>Batch II</b>	<b>Batch III</b>	<b>Average</b>
Initial quantity of Tila taila (l)	7	7	7	7
Fianl quantity of Dasha Avartita Guduchi taila (l)	5.9	5.8	5.6	5.7
Yield in %	84.28	82.85	80	82.37
Loss (l)	1.1	1.2	1.4	1.2
Loss in %	15.71	17.14	20	17.61

Organoleptic charcters of prepared Guduchi taila is given in table no.8. Batch 1 taila is dark greenish in colour while in Batch II & III prepared oil is greenish in colour. Taila is having viscous consistency, sweetish in odour and bitter in taste as shown in table no. 8.

**Table: 8 Organoleptic characters of Dasha paka Guduchi taila ( 3 batches.)**

<b>Organoleptic characters</b>	<b>Batch I</b>	<b>Batch II</b>	<b>Batch III</b>
Colour	Dark greenish	Greenish	Greenish
Consistency	Viscous	Viscous	Viscous
Odour	Sweetish	Sweetish	Sweetish
Taste	Bitter	Bitter	Bitter

The temperature during the different stages of taila paka is recorded and tabulated in table no.9

**Table: 9 Observation on the temperature at different stages of Dasha Avarita Guduchi taila (3 batches)**

<b>Observations</b>	<b>Batch I</b>	<b>Batch II</b>	<b>Batch III</b>
On loss of moisture of Taila	80	78	75
On adding of kalka	70	68	70
On adding of Cowmilk	55	50	52
At boiling stage	88	85	88
At phenodgama	75	78	76
At mrudupaka stage	70	72	70
At madhyampaka stage	72	72	70
At Filtration time	52	58	50

## **DISCUSSION:**

Sneha kalpana is one of the highly established kalpana from another kalpana. It is commonly prescribed Ayurvedic dosage form in day-to-day practices. In different Samhitas so many medicated ghrita and taila were prescribed for the different disease conditions. As per the



Acharya Sushruta Tila, tail is the best among all the tail while the go-ghrita among of ghrita. Guduchi taila was mentioned in the chakradatta in vatraktachikitsa chapter. Guduchi taila is also used in the Chikitsa of kustha. Guduchi is Tikta rasa so that's why oil prepared by Guduchi Kwatha is more bitter. So the concept of Avartana is used for dose minimization and easy palatability. For easy administration of oil as saman sneha we prepared Dasha Avartita Guduchi taila. In the process of Avartana sneha dravya was the same but every time drava dravyas and kalka dravya were added according to sneha dravyas.

During the preparation of the *Guduchi* kwtha, a Fresh guduchi stem was taken in this study. For more from guduchi extraction in water; it was cut into very small pieces and crushed and after that overnight soaking was done. It is considered as Mridu dravyas, thus the quantity of water taken for Kwatha preparation was four times to the drug and reduced up to one-fourth to the initial quantity by evaporating it on mild heat. The continuous stirring was done to avoid the sticking of the drug at the bottom of the vessel. During the heating process of *Guduchi* kwatha forth formation was observed that may appear due to starch content of Guduchi. The color of the Kwatha was found Dark greenish-brown.

*Guduchi* taila was prepared as per the reference of Chakradatta<sup>5</sup>. Ksheer was taken equal to the sneha dravyas as mentioned in the text. Crackling sound and forth was observed when Guduchi Kalka was added to the hot oil, which is probably due to the moisture content in the Kalka. The Kwatha was added in the Sneha in the initial stage of Paka. After boiling, the Milk was added by maintaining the temperature around 50-55<sup>0</sup> C to avoid spoiling of milk. It was observed in the pilot batch that if the temperature of milk and oil is different then there are chances of spoilage of milk and fatty particles of milk were aggregated. The scientific explanation is at the temperature above the boiling point casein micelles are aggregated and due to this temperature, the acidic pH of the media also accelerates the process. Due to heating the buffer capacity of milk salt also changed, carbon dioxide is released, organic acids are produced and casein phosphate may precipitate with the release of hydrogen ions. This is the reason behind the maintenance of the temperature.

During the heating process of Sneha, the color of Kalka became dark brown. The specific observation was seen in oil that after mridupaka stage liquid convert into semisolid form. At madhyam Paka of oil continuous string was needed to avoid the burning of Kalka material. After

the Sneha sidhi lakshna oil got separated from Kalka. The change in colour and smell were observed in the final product. As by adding milk as *drava dravya* Paka was carried out for 2 days according to classics, for enhancing the absorption of active principles to the taila by increasing the contact of the ingredients at different temperature for two nights which potentiates the chemical constituents into the taila<sup>6</sup>.

For the 2<sup>nd</sup> avratana of Guduchi taila Sneha dravyas were taken according to 1<sup>st</sup> avrtita guduchi taila and for every avratana this procedure was repeated. Initially color of Guduchi taila was yellowish. After 2 avartana color became dark yellowish and color of dasha avartita Guduchi taila was dark brownish. After 5<sup>th</sup> avartana of Guduchi taila oil got became viscous and some solid particles can be seen in oil that may be due to milk fat convert into Ghrita form. So the number of avartana process changed the structure of oil and also colour of oil became changed. The taste of Dasha avartita Guduchi taila was more bitter due to the repeated adding of Guduchi Kwatha in every sneha Paka. The reason behind the loss after every avartana process is that Guduchi stems were fibrous so they could not be converted in fine paste form so during the sneha Paka milk fat was mixed with Guduchi kalka and it was hard to separate from kalka.

## CONCLUSION

The meaning of avartana is repetition. Avartana of taila will help in minimizing the dose, increase the effect, and quicker action but avartana process is used rarely because of the long duration required for its preparation, increase in cost, and loss of quantity occur. The avartana process helps to increases the potency of the formulation. The developed process of Dasha Paka Guduchi taila may be taken in the further pharmaceutical study and also, it will be helpful in Furthur scientific research.

Fig 1	Fig 2
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Fig 3



Fig 4



Fig 5



Fig 6



Fig 7



Fig 8



Fig 9



Fig 10



Fig 11



Fig 12



Fig 13



Fig 14



Fig 15



Fig 16



Fig 17



Fig 18

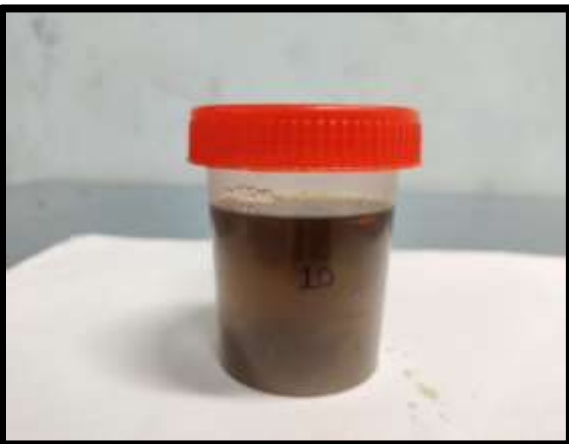


Fig .

- 1.Guduchi stem
- 2.Guduchi stem cut into small pieces
3. Guduchi stem crushed
4. Adding water for Kwatha preparation
- 5.Overnight soaking
- 6.kwatha preparation
- 7.Tila taila
- 8.kalka preparation
- 9.adding of kalka and Kwatha
- 10.adding of milk
- 11 snehapaka process
12. phenodgama
13. After 10 snehapaka filtration of oil
- 14.color of kalka after snehapaka
15. Dasha Paka guduchi taila -1
16. Dasha Paka guduchi taila -2
17. Dasha Paka guduchi taila -3
18. After few days some layer of ghritha seen in storage container

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