Taila murchchhana with respect to comparative physico-chemical analysis of plain sarshapa taila and murchchhita sarshapa taila

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Abstract
Sneha Kalpana (medicated Taila and Ghrita) is one of the important dosage form among Ayurvedic medicament. It is used as both externally and internally. While preparing Sneha Kalpana first of all Sneha should undergo one particular Samskara called Sneha Murchchhana and it is used for Amadoshaharatwa, removal of bad odor, imparting color and increasing potency of the drug. Sarshapa Taila Murchchhana was done as mentioned in Bhaishajyaratnavali. Analysis on modern parameters of plain and Murchchhita Sarshapa Taila was done and comparison of various parameters on quality assessment were done. By Murchchhana process Sarshapa Taila converted into dark red colour from light yellow and get good order from pungent sulphurous odour. Physico-chemical parameters were applied for assessing the prepared formulation. The physico-chemical analysis showed slightly increased weight per millilitre (g) (0.9076). The moisture content (%w/w) slightly decreased (0.09) which shows decrease in rancidity. The viscosity (cpc) decreased considerably from 122 to 60 which shows increased rate of absorption. The acid value decreased (0.8047) which shows decrease in rancidity. We conclude that Murchchhita Sarshapa Taila is better than plain Sarshapa Taila for medicated oil preparations.

Keywords: sneha kalpana, ayurvedic medicament, samskara, sarshapa taila murchchhana, plain sarshapa taila

1. Introduction
Ayurveda has given the greatest emphasis to comprehensive knowledge of drugs including identification, procurement, processing, preservation and dispensing of prepared drug under a broad heading known as Bhaishajya Kalpana. The term Bhaishajya Kalpana is formed by the basic processing techniques of Bhaishajya Kalpana are elaborately explained in Samhitas. They were called the Panchavidha Kashaya Kalpana. – Swaras, Kalka, Kwatha, Hima, Phanta [3]. These have been derived from five Kashaya yoni expect Lavana Rasa. All Kalpanas are well known among Ayurvedic medicines by using some raw material according to physicians requirements. This science explains various methods of processing a drug in order to make the drug- More palatable, rich with potency, pleasing with good odor, colour etc, and long lasting or improve the self life of the preparation. The basic processing techniques of Bhaishajya Kalpana are elaborately explained in Samhitas. They were called the Panchavidha Kashaya Kalpana. – Swaras, Kalka, Kwatha, Hima, Phanta [3]. These have been derived from five Kashaya yoni expect Lavana Rasa. All Kalpanas are mainly based on water contents or water soluble part. Since they have less shelf life so to prepare the formulations which can be preserved for long time and can be administered conveniently- Churna, Vati, Sneha, Sandhana Kalpana etc. were introduced. Sneha Kalpana is well known among these. Sneha preparations have better pharmacokinetic action in comparison to other dosage forms because of the lipoid nature of the biomembranes, as lipid soluble substances readily permeate into the cells.
Introduction of Sneha Kalpana into Ayurvedic pharmacutics may be the result of the above mentioned facts. The rationality behind taking oil as a base is presumably to extract lipid-soluble active fractions from the ingredients into the oil and even this formulation holds its properties for longer period when compared to primary preparations. Sneha Kalpana is again of two types depending upon base material i.e. Ghrita and Taila Kalpana. Taila Kalpana have been used abundantly due to its use for all four modes of drug administrations like Pana, Abhyanga, Nasya, Basti and through all the bodily routes of drug administration. While preparing Sneha Kalpana first of all Sneha should undergo one particular Samskara called Sneha Murchchhana. It is applicable for both Ghrita and Taila. Sneha Murchchhana is not described in ancient books – Charaka Samhita, Sushrut Samhita, Astanga samgraha, Astanga hridaya. Murchchhana process is firstly mentioned in Sharngdhara Samhita commentary by Kashir’s Gudhartha-Dipika [8]. Yogatarangini Brihatyogatarangini, Yogratnakar and Bhaishajyaratnavali also dealt with concept of Sneha Murchchhana. Bhaishajyaratnavali dealt details of the Murchchhana of different oils (Tila Taila, Sarshapa Taila); Murchchhana process is firstly mentioned in Sharngdhara Samhita commentary by Kashir’s Gudhartha-Dipika [8]. Yogatarangini Brihatyogatarangini, Yogratnakar and Bhaishajyaratnavali also dealt with concept of Sneha Murchchhana. Bhaishajyaratnavali dealt details of the Murchchhana of different oils (Tila Taila, Sarshapa Taila, Erand Taila) and Ghrita with specific herbal drugs.

**Ingredients**

**Table 1:** Showing the Ingredients and Their Ratios for Sarshapa Taila Murchchhana by Bhaishajyaratnavali [10]

| S. No. | Ingredie-NTS | Latin Name          | Family           | Part Used | Quantity |
|-------|--------------|---------------------|------------------|-----------|----------|
| 1     | Kaalaka      | Phyllanthus emblica | Euphorbiaceae    | Pericarp  | 1 Karsh (12 gm) |
| 2     | Haridra      | Curcuma longa       | Zingiberaceae    | Rhizome   | 1 Karsh (12 gm) |
| 3     | Musta        | Cypruss rotandus    | Cypraceae        | Tuber     | 1 Karsh (12 gm) |
| 4     | Bilva        | Angel marmelos      | Rutaceae         | Unripe Fruit | 1 Karsh (12 gm) |
| 5     | Dadima       | Punica granatum     | Punicaceae       | Seeds     | 1 Karsh (12 gm) |
| 6     | Nagakeshara  | Mesua ferrea        | Calophyllaceae   | Stamens   | 1 Karsh (12 gm) |
| 7     | Krisna Jiraka| Carum carvi         | Umbelliferace    | Fruit     | 1 Karsh (12 gm) |
| 8     | Hribera      | Pavonia odorata     | Malvaceae        | Root      | 1 Karsh (12 gm) |
| 9     | Nalika       | Cinnamomum zyliacum | Lauraceae        | Inner stem bark | 1 Karsh (12 gm) |
| 10    | Bibhitaka    | Terminalia bellirica| Combretaceae     | Pericarp  | 1 Karsh (12 gm) |
| 11    | Manjishihda  | Rubia cordifolia    | Rubiaceae        | Root      | 2 Pala (96 gm) |

| S. No. | Ingredient   | Family     | Part Used | Quantity |
|-------|--------------|------------|-----------|----------|
| 1     | Sarshapa Taila | Brassica canestrpis | Brassicaceae | Seed oil | 1 Prastha (768ml.) |
| 2     | Drava        | -          | -         | 1 Adhaka (3.72 litre) |
| 3     | Water        | -          | -         | -        |

*1 Karsa = 12gm In the case of liquid, the metric equivalents would be the corresponding litre and milliliter [11] So, 1 Prastha = 64 Karsa = 768ml

*The conversion of ml into gm in this table is done by weighing on the weigh machine.

**Equipment**

Mortar & pestle, Mixer-Grinder, Sieve, Heating device – gas burner with LPG-cylinder, Aluminium Vessel – Diameter-46.5cm, Depth-26cm, wt – 6.8 kg, and Capacity – 50 lit., Cotton cloth, Measuring cylinder, stainless steel ladle, Thermometer.

**Procedure**

All the Kalka Dravyas were made into coarse powder form (Yavakut Churna) and Kalka was prepared by soaking in water that was 2500ml and left undisturbed overnight (about 18 hrs.). On next morning Sarshapa Taila was taken in a aluminium vessel and heated over Madhyama Agni till complete evaporation of moisture content, and the temperature was around 164°C. The Kalka was added to the Taila after slight cooling, and the temperature was around 95 °C. After adding Kalka, water was added and heated it with intermediate stirring. Heating process was carried out till Sneha Siddhi Lakshana appeared, then vessel was taken out

**Table 2:** Showing Ingredients and Their Weights used for Sarshapa Taila Murchchhana.

| S. No. | Ingredients   | Weight          |
|-------|---------------|-----------------|
| 1     | Sarshapa Taila | 4 Prastha (3072 ml) (2646 gm) |
| 2     | Kalka – [Amalaki, Haridra, Musta, Bilva, Dadima, Nagakeshara, Krisna jiraka, Hribera Nalika, Bibhitaka, ] [ Manjishihda ] | 72 Karsh (864 gm) [Each 4 Karsh (48 gm) ] [8 Pala (384 gm)] |
| 3     | Water         | 4 Aadhaka (12288 ml) (11736gm) |
from the fire and Taila was filtered through clean cloth in its hot stage. Murchchhita Sneha was store in a container after cooling.

**Precautions**

- Fresh Sarshapa Taila should be taken.
- The vessel used for the process should be clean and of adequate size, in order to avoid spilling of Taila due to excess foaming during Murchchhana process.
- Kalka should be made with coarse powder and soaked into water overnight to avoid the sticking of Kalka to the vessel.
- When froth appears in the Taila, the temp was maintained to protect the Taila coming out from vessel.
- Continuous stirring was carried out to avoid the sticking of Kalka especially in last stage.

**Observations during Murchchhana**

- Initiation of process crackle sound was heard in Sarshapa Taila.
- Appearance of fumes and eye irritation get started due to fumes.
- Specific smell of Sarshapa Taila.
- When Taila get moisture free then the fumes comes out abundantly and the colour of Taila slightly changes but unable to differentiate clearly.

### 3. Observation and Result

#### 3.1 Pharmaceutical Study

**Table 3:** Observations with Temperature (°C) During Sarshapa Taila Murchchhana

| Observations                                      | 1st Batch | 2nd Batch | 3rd Batch | Average |
|---------------------------------------------------|-----------|-----------|-----------|---------|
| Initial temp. of Sarshapa Taila                   | 34.5      | 36        | 34        | 34.8    |
| Temp. when Taila get moisture free                | 164       | 172       | 155       | 163.7   |
| Temp. at the time of Kalka add                    | 95        | 100       | 110       | 101.7   |
| Temp. after adding Kalka and the time of water add| 76        | 58        | 60        | 64.7    |
| Temp. after adding water                          | 57        | 40        | 41        | 46      |
| Temp. at which boiling of Taila start              | 96        | 94        | 94        | 94.7    |
| Temp. after one hour of starting of Taila boiling | 99        | 97        | 97.6      | 97.9    |
| Temp. at the time of Phenodgama                   | 98        | 96.9      | 93        | 96      |
| Temp. at the time of Mridu Paka stage              | 94        | 96.9      | 93        | 94.6    |
| Temp. at the time of Madhyama Paka stage           | 95.5      | 98        | 93        | 95.5    |
| Temp. at the time of filtration                   | 90        | 91        | 85        | 88.7    |

**Table 4:** Duration of Sarshapa Taila Murchchhana

| Observation                                      | 1st Batch | 2nd Batch | 3rd Batch | Average |
|---------------------------------------------------|-----------|-----------|-----------|---------|
| Total duration to obtain moisture free condition  | 48 hrs    | 35 hrs    | 42 hrs    | 42 hrs  |
| Time of Kalka added (in min.)                     | 73        | 60        | 68        | 67      |
| Time of water added (in min.)                     | 78        | 65        | 72        | 72      |
| Time of starting Taila boiling (in min.)          | 115       | 103       | 105       | 108     |
| Time of Phenodgama                                | 11 hrs 25 min. | 13 hrs 8 min. | 12 hrs 30 min. | 12 hrs 21 min. |
| Duration of Mridu Paka stage                      | 11 hrs 40 min. | 13 hrs 8 min. | 12 hrs 30 min. | 12 hrs 26 min. |
| Duration of Madhyama Paka stage                   | 14 hrs 17 min. | 15 hrs 10 min. | 14 hrs 45 min. | 14 hrs 44 min. |
| Total time required for Taila Murchchhana          | 14 hrs 17 min. | 15 hrs 10 min. | 14 hrs 45 min. | 14 hrs 44 min. |
| Total time required for Taila Murchchhana (in days)| 3         | 3         | 3         | 3       |

**Table 5:** Sneha Siddhi Lakshan of Taila Murchchhana

| S. No. | Sneha Siddhi Lakshan          |
|--------|-------------------------------|
| 1      | Sanyav eve aityase            |
| 2      | Madhye darvi vimunchati       |
| 3      | Varti formation               |
| 4      | Shabda hino Agni nikshipta    |
| 5      | Phenodgama                    |
| 6      | Gandh varna rasotpati         |

**2.2 Analytical Study**

Analysis of Sarshapa Taila and Murchchhita Sarshapa Taila was done as per “General Guidelines for Drug Development of Ayurvedic Formulations”, Volume – 1, Central Council for Research in Ayurvedic Sciences, Ministry of Ayush, Govt. of India, New Delhi, 1st edition – 2018. Physicochemical analysis of the samples were carried out at Multani Pharmaceuticals Limited (Analytical division), Haridwar, Uttarakhand and pH of the samples was carried out at laboratory of Deptt. Of Rasa Shastra and Bhaishajya Kalpana, BHU, Varanasi.
after Murchchhana process, duration and may be due to the addition of some active bioconstituents slightly increased after the process of odour in Murchchhita Sarshapa Taila. Sarshapa Taila was converted in Murchchhita Dravyas after Murchchhana process. Pungent sulphurous odour of was Katu & Tikta, which was converted in Tikta & Ka Dravya in Murchchhana process. Taste of Sarshapa Taila light yellow because of Manjishtha that was used as Kalka colour of Sarshapa Taila was converted in dark red from average loss in volume was found to be 29.93%.

Stage absence of crackling sound when 3072 ml amount of Sarshapa Taila. At Madhyama Paka Murchchhana took 14hrs.44min. in completion for 4 Prastha concluded that Pharmaceutical study of Sarshapa Taila As the present article is a preliminary study it can be 4.

Table 6: Showing the Result Obtained During Preparation of Sarshapa Taila Murchchhana

| Result | 1st Batch | 2nd Batch | 3rd Batch | Average |
|--------|-----------|-----------|-----------|---------|
| Initial quantity of Sarshapa Taila (in ml.) | 3072 | 3072 | 3072 | 3072 |
| Initial quantity of Sarshapa Taila (in gm.) | 2646 | 2646 | 2646 | 2646 |
| Obtained quantity of Murchchhita Sarshapa Taila (in ml.) | 2702.15 | 1840 | 1915 | 2152.38 |
| Obtained quantity of Murchchhita Sarshapa Taila (in gm.) | 2329.39 | 1558.18 | 1587.8 | 1825.12 |
| Loss of Taila (in ml.) | 369.85 | 1232 | 1157 | 919.62 |
| Loss of Taila (in gm.) | 316.61 | 1087.82 | 1058.2 | 820.88 |
| % of gain in volume | 87.96 | 59.90 | 62.34 | 70.07 |
| % of gain in weight | 88.03 | 58.89 | 60 | 68.97 |
| % loss in volume | 12.04 | 40.10 | 37.66 | 29.93 |
| % loss in weight | 11.97 | 41.11 | 40 | 31.03 |
| Initial quantity of Kalka (in gm.) | 864 | 864 | 864 | 864 |
| Obtained quantity of Kalka (in gm.) | 2638.8 | 2113.3 | 2266.2 | 2339.43 |
| Colour of Kalka after filtration | Dark brown | Dark brown | Dark brown | Dark brown |

The conversion of ml into gm in this table is done by weighing on the weigh machine.

3.2 Analytical Study

Table 7: Showing Organoleptic Characters of Sarshapa Taila and Murchchhita Sarshapa Taila

| Sample | Colour | Taste | Odour | Consistency | Texture |
|--------|--------|-------|-------|-------------|---------|
| Sarshapa Taila | Light yellow | Katu, Tikta | Pungent Sulph-urous odour | Liquid | Oily |
| Murchchhita Sarshapa Taila | Dark reddish | Tikta, Kashaya | Murchchhita Dravyas odour | Liquid | Oily |

Table 8: Showing Different Physico - Chemical Parameters and Their Result of Sarshapa Taila and Murchchhita Sarshapa Taila

| S. No. | Parameters | Sarshapa Taila | Murchchhita Sarshapa Taila |
|--------|------------|----------------|---------------------------|
| 1 | Weight/ml (g) at 40°C | 0.9051 | 0.9076 |
| 2 | pH value | 4.84 | 3.65 |
| 3 | Moisture content (% w/w) | 0.13 | 0.09 |
| 4 | Refractive index at 40°C | 1.4673 | 1.4694 |
| 5 | Viscosity (cpc) (Spindle No. 64) | 122 | 60 |
| 6 | Iodine value | 106.22 | 108.31 |
| 7 | Saponification value | 195.80 | 193.54 |
| 8 | Unsaponifiable matter | 0.81 | 0.34 |
| 9 | Acid value | 2.72 | 0.8047 |
| 10 | Peroxide value | 11.45 | 11.6159 |
| 11 | Mineral oil test | Absent | Absent |

Table 9: Showing Microbial Count of Sarshapa Taila and Murchchhita Sarshapa Taila

| Sample | Total Viable Aerobic Count | Total Fungal Count | Enterobacteriaceae Presence |
|--------|---------------------------|--------------------|-----------------------------|
| Sarshapa Taila | <10 | <10 | Absent |
| Murchchhita Sarshapa Taila | 10 | <10 | Absent |

4. Discussion
As the present article is a preliminary study it can be concluded that Pharmaceutical study of Sarshapa Taila Murchchhana took 14hrs.44min. in completion for 4 Prastha (3072 ml) amount of Sarshapa Taila. At Madhyama Paka stage absence of crackling sound when oil and Kalka particles were sprinkled on the fire. It shows the absence of water content in Murchchhita Sarshapa Taila. Average quantity of Taila obtained in volume was 70.07% and average loss in volume was found to be 29.93%.

Analytical study show that after Murchchhana process the colour of Sarshapa Taila was converted in dark red from light yellow because of Manjishtha that was used as Kalka Dravya in Murchchhana process. Taste of Sarshapa Taila was Katu & Tikta, which was converted in Tikta & Kashaya after Murchchhana process. Pungent sulphurous odour of Sarshapa Taila was converted in Murchchhita Dravyas odour in Murchchhita Sarshapa Taila. In physico-chemical characters the weight per millilitre (g) slightly increased after the process of Murchchhana which may be due to the addition of some active bioconstituents from the herbs used for Murchchhana. Murchchhita Sarshapa Taila is more acidic than plain Sarshapa Taila, this indicates that the drugs used in Murchchhana are more acidic in nature e.g. Amalaki. After Murchchhana process, moisture content became less (0.09%w/w) that is negligible that show Murchchhita Sarshapa Taila is good with respect to rancidity. The refractive index after Murchchhana slightly increased which may be due to colouration and phytoconstituents. Because of Murchchhana process viscosity of Sarshapa Taila decreases. If the viscosity of the liquid preparation is decreased, the rate of absorption is increased. The iodine value increased a bit and the saponification value decreased a bit after Murchchhana process. The unsaponifiable matter after Murchchhana decreased when compared to Taila which indicates the process of refining. A high acid value in the oil may leads to early rancidity of the oils. The acid value decreased after Murchchhana process. There was slightly increase in the peroxide value after Murchchhana and this indicated that there is no more difference in the stability due to Murchchhana process. Mineral oil in Sarshapa Taila and
Murchchhita Sarshapa Taila was absent. Total viable aerobic count was slightly increased after Murchchhana process, but it is much less than the maximum acceptable count of total aerobic microbe \(10^2\ \text{CFU/g or CFU/ml} = 200\) -according to The International Pharmacopoeia). This may be due to improper hygiene during the preparation or packing of drug.

![Fig 1: Ingredients of Sarshapa Taila Murchchhana](image)

![Fig 2: Adding Kalka](image)

![Fig 3: Adding Water](image)

![Fig 4: Boiling of Taila](image)

![Fig 5: Sneha Siddhi Lakshana](image)

![Fig 6: Filtration](image)

![Fig 7: Prepared Murchchhita Sarshapa Taila](image)

5. Conclusion
From the above review, it has been concluded that after Murchchhana process, the Sarshapa Taila gets all characters that described in Ayurvedic texts. By doing Murchchhana, Sneha will get good smell and colour. Because of Murchchhana, Sneha will get the active principles of Murchchhana Dravyas too. The physico-chemical analysis showed weight per millilitre (g) (0.9076), pH value (3.65), moisture content (% w/w) (0.09), refractive index (1.4694), viscosity (cpc) (60), iodine value (106.22), saponification value (193.54), unsaponifiable matter (0.34), acid value (0.8047), peroxide value (11.6159) and mineral oil test (absent). These parameters showed that Murchchhita Sarshapa Taila is better than plain Sarshapa Taila for medicated oil preparations.

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