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Pharmaceutical analytical study of *Hingwadi Taila*

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ABSTRACT

Hingwadi Taila is a Ayurvedic herbo mineral compound which is used mainly in the management of *Kashtartava* and *Arthavajana*. *Hingwadi Taila* contain drugs like *Hingu*, *Kasisa*, *Saindhava*, *Kumari*, *Shunti*, *Tejapatra*, *Trikshara*, *Samudraphena*, *Haridra*, *Daruharidra* and *Sarshapa Taila*. These drugs are very potent individually and possess *Vedhana Sthapaka* property. Our *Acharyas* has led down many pharmaceutical procedures through which many *Dravyas* can be taken in combination for better action and for easy assimilation to body. This *Taila* has got many *Teekshna* and *Kshara Dravyas* in it. Hence before administering internally, it has to be analyzed for its Organoleptic properties, acid value, Iodine value, moisture content w/w and saponification value. All the parameters are found to be good and within the standard parameters.

Key words: *Hingwadi Taila*, Analytical Study.

INTRODUCTION

Our body is made up of *Sneha* (*Snehasaroo Ayam Purushaha*), thus any medicines given through this medium can be easily absorbed both internally and externally. *Sneha Kalpana* is a kind of formulation which is processed in a manner that both lipid soluble and water-soluble active principles of the drug are transferred into *Sneha*. *Hingwadi Taila*^[1] is herbo-mineral preparation used internally in the management of *Kashtartava* mentioned in *Bhaishjya*

Ratnavali Yoni Rogadhikara. This formulation has got *Rajosanjana* & *Kashtartava* property. The oil base used in the formulation is *Sarshapa Taila*. Mustard oil has got many chemicals like erucic acid, omega fatty acids and linoleic acids.^[2] Erucic acid is said to soothe aches and pains. It is hypothesized that the erucic acid in the oil blocked some pain signals. Other *Dravyas* present in *Hingwadi Taila* is known to possess *Vedhana Sthapaka*, *Kaphavatahara*, *Deepana*, *Vatanulomana* etc. properties. By virtue of this *Gunas* it acts on *Kashtartava*.

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OBJECTIVE OF THE STUDY

To prepare and analyze *Hingwadi Taila*.

MATERIALS AND METHODS

Ingredients

Shudha Hingu, *Shodhita Kasisa*, *Saindhava Lavana*, *Shunti*, *Tejapatra*, *Shodhita Chitraka*, *Sahasaara*, *Shodhita Samudraphena*, *Karpoora*, *Yavakshara*, *Sarja Kshara*, *Shodita Tankana*, *Haridra*, *Daruharidra* all these ingredients are taken in equal quantity around 108g each.

Preparation of Taila

Murchana of Sarshapa Taila was done according to Bhaishajya Ratnavali. Hingu Shodhana^[3] was done by doing Barjana with Godugha, Kasisa Shodhana^[4] by Bhavana with Nimbu Swarasa, Chitraka Shodhana^[5] by Nimmajanna in Sudhajala, Samudraphena Shodhana^[5] by Bhavana with Nimbu Swarasa for 1 day and Tankana Shodhana by Barjana. All the above Dravyas were taken and Kalka was made. Murchita Sarshapa Taila was taken in a clean and dry Patra and placed over a mild fire. Taila was heated until foam starts to appear. Soon the fire was lit off and waited for Nisphena Bhava and Saityabhava of Taila. Taila was again placed over mild fire and 24000ml of water and Kalka were added. This mixture was heated on Mandagni with frequent stirring to avoid adhering of Kalka to the bottom of the vessel. Temperature was checked every 15 minutes. The heating process was continued until all the Sneha Sidda Lakshana appeared and the Taila part only remained. After attaining Sidda Lakshana, the stove was lit off. The Taila filtered in the warm stage through a four folded white color cloth. The Taila was allowed to cool and stored in air tight glass jar.

Duration of Taila Paka

Table 1: Showing duration of Taila Paka.

Day 1	3 hours
Day 2	4 hours
Day 3	3 hours
Day 4	4 hours
Day 5	4 hour 30 min
Day 6	4 hour 30 min
Day 7	3 hours
Day 8	6 hours

OBSERVATIONS

Precautions

- Adequate size and volume of vessel was used

- Vastra Galita fine powder was used to prepare Kalka Dravya
- Mandagni (temperature 60° to 90°C) was maintained throughout the procedure
- Continuous stirring was done to avoid charring.
- Clean cloth was used to filter the Taila
- Taila was filtered in warm condition to avoid the excess loss.
- Agni was altered continuously to avoid spillage of oil.

Hingwadi Taila results

- Initial weight of Murchita Taila: 6000ml
- Weight after Paka: 5460 ml
- Loss: 540 ml
- Total yield: 90.818
- Total time taken for the procedure: 32hours

Table 2: Showing Organoleptic characters of Hingwadi Taila

Parameter	Observation
Colour	Dark brown colour
Odour	Characteristic odour
Appearance	Greasy
Texture	Smooth

Table 3: Showing results of Standardization Parameters of Hingwadi Taila.

Parameters	Hingwadi Taila
Specific gravity	0.9241
Refractive index	1.415
Rancidity	Fat is not oxidized
Saponification value	192.46
Loss on drying at 105°C	0.2937

Acid value	2.32
Iodine value	90.31
Peroxide value	0

Hingwadi Taila Preparation



Fig. 1: Ingredients for Taila



Fig. 2: Kalka



Fig. 3: Taila, Kalka and Drava



Fig. 4: Phenogama of Taila



Fig. 5: Separation of Taila



Fig. 6: Varti formation

DISCUSSION

Hingwadi Taila was quoted in *Bhaishajya Ratnavali*, but the *Drava Dravya* for the preparation was not mentioned, So, as per *Sharangadhara Anukta Maana*, *Jala* was taken as *Drava Dravya*.

Mandagni (i.e., 60-80°C) was maintained throughout the procedure in order to prevent the evaporation of active principle and to avoid adhering of *Kalka* on the bottom of the vessel and also avoid spillage of *Taila*.

Later after 10 hours there was formation of thick foam upon *Taila*, this may be due presences of excessive alkali compounds i.e., *Trikshara* and *Tankana*. It might be due to saponification. Saponification is a process that involves the conversion of fat, oil, or lipid, into soap by the action of aqueous alkali.^[6] Soaps are salts of fatty acids, which in turn are carboxylic acids with long carbon chains. Here after completion of *Taila* the acids value of *Hingwadi Taila* are within limits which indicates there was no formation of carboxylic acids with no long carbon chains.

We had to remove the vessel off the stove to reduce the effusion of *Taila*, when vessel was taken off *Agni*, temperature reduced as formation of froth increase with increase in *Agni*. It took long duration (32hours) for *Taila Paaka* as the *Agni* given was very low.

The *Phena* formed during 10th hour and during completion (*Phenodgama* stage) of *Taila* was different and at 10th hour foam was thick, cakey consistence while in *Phenodgama* stage the foam formed appeared like a mass of small bubbles on *Taila*. The reduction in the quantity of foam and the increased consistency was due to the evaporation of the water content and formation of short chain in the *Taila*

Total quantity of *Taila* taken was 6000 ml. Volume of the *Taila* obtained was 5460 ml. The loss of 540ml was due to the evaporation, spilling of *Taila* during the preparation and due to the absorption of *Taila* by *Kalka*.

Taila attains good odour, colour, and taste of drugs added and took 32 hours for *Taila* preparation. *Tailas* are unsaturated fatty acids with double bonded structures. On heating, generation of lower fatty acid takes place due to oxidation and foam appears. According to article, Longer the duration of preparation of oils, more of the absorption of fat-soluble constituents of the ingredients takes place.

Duration of *Paka* depends upon the nature of the liquids added to the oil.

Physico chemical parameters

Refractive index^[7]

It depends on colour of the medium, Density of the medium, Temperature of the medium, No of solutes present in the medium More the Refractive Index, there will be more concentration of light, which facilitates rancidification of *Taila* and also due to presence of water content, the decomposition of *Taila* takes place at a faster rate.

Specific gravity^[8]

It indicates the solid to liquid ratio in the *Taila*. Specific Gravity of *Hingwadi Taila* (0.9241) is more compared to *Raw Sarshapa Taila* (0.91) and *Murchita Taila* (0.91). It would be due to solid extractives that come from the herbs and mineral compound added during the process of *Taila Paka*.

Rancidity^[9]

Oils can be susceptible to rancidity because it is caused by biochemical reaction between fats and oxygen. Thus, know as oxidative rancidity. In this process long chain fatty acids are degraded and short compounds are formed. One of the reaction products is butyric acid, which causes the typical rancid taste. *Hingwadi Taila* have shown no rancidity.

Acid value^[10]

It is defined as the amount of KOH necessary to neutralize the free acid present in 1g of the substance. Significance: A measure of the amount of Carboxylic acid groups in a chemical compound, such as fatty acid, or in a mixture of compounds. Triglycerides are converted into free fatty acids and glycerol, causing an increase in acid value which inturn leads to rancidity. This action occurs through lipase enzyme. Less acid value denotes the less chance of decomposition of *Taila* thus increasing both life span and therapeutic value.

Saponification value

Saponification value indicates breaking down of oil into glycerol and free fatty acids by treatment with

alkali. It gives an idea about the molecular weight of an oil / Fat. The saponification value and molecular weight of oil are inversely proportion. It is helpful in determining adulteration of given fat by one of the lower or higher saponification value. The higher saponification value of *Hingwadi Taila* indicates presences of short-chain fatty acids. It suggests that, more the short chain fatty acid more is the rate of absorption, thus leading to the increased efficacy of the *Taila*.

Note^[11]

- Short- and medium-fatty chains can be absorbed directly into the bloodstream from the intestinal microvillus because they are water-soluble.
- While Long-chain fatty acids form a large lipoprotein structure called a Chylomicron that transports fats through the lymph system.

Iodine value: Iodine number is a measure of the degree of unsaturation in an oil.^[12]

Significance: The iodine number is useful to determine the quality of *Taila* or its freedom from adulteration. It is use to check the oxidative rancidity of oils, higher the unsaturation greater is the possibility of oil to go to rancid. The more iodine number, the more unsaturated fatty acid bonds i.e., a greater number of double bonds in the Oil. The more iodine is attached, the higher is the iodine value and the more reactive, less stable and more susceptible to oxidation and rancidification. In this study, *Murchita Taila* (101.05) is having high Iodine value than *Hingwadi Taila* (90.31), so there will be early rancidity in the *Murchita Taila* than the *Hingwadi Taila*, Usually after *Murchana Samskara*, the Iodine value of the *Taila* increases, so there will be more unsaturation, and it helps to extract the components which are present in the *Hingwadi Taila*.

Peroxide value^[13]

It is the most widely used analytical method. It gives a measure of the extent to which an oil/ghee sample as undergone primary oxidation. Peroxide value of *Hingwadi Taila* was 0 and there is no primary oxidation.

CONCLUSION

Sneha Kalpana is one of the unique preparations in which water soluble and oil soluble substances are extracted. According to the reference body is made up of *Sneha (Sneha Saro Ayam Purushaha)*, hence *Gritha* and *Taila Kalpanas* are commonly practiced. *Hingwadi Taila* is one such herbomineral compound that has been taken from *Bhaishajya Ratnavali* that possess the ingredients like *Hingu, Kasisa, Saindhava, Kumari, Shunti, Tejapatra, Trikshara, Samudraphena, Haridra, Daruharidra* and *Sarshapa Taila* which is found to be very effective in management of *Kashtarava*. Since, it has got many *Teekshna Aushadha Dravyas* and *Sarshapa Taila* its validation is a must. Thus, *Hingwadi Taila* both physical and chemical parameters were found to be within limits.

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