



CHEMICAL ANALYSIS OF NIRGUNDI TAILA WITH SPECIAL REFERENCE TO PREPARATION IN DIFFERENT NUMBER OF DAYS

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ABSTRACT

Sneha kalpana is a process where the active principles present in the drug are extracted with the Sneha (Ghee or Oil) during the pharmaceutical process. The method of preparation of different Taila kalpanas requires different Drava dravyas and different number of days for the paka. Nirgundi taila as said in Charaka Samhita Chikitsa sthana 28/134 was prepared with Tila taila as the base. The three different oil samples were prepared by adding Nirgundi Patra Swarasa as the drava dravya. The samples prepared in 1, 2, 3 days were coded as N.T.S1, N.T.S2 and NTS3 respectively. These samples were subjected to various physico-chemical analysis to determine whether there is any difference in the values of the oil completed in various numbers of days. The prepared samples were compared with the normal tila taila.

KEY WORDS: Sneha Kalpana, Nirgundi Taila, Oil samples, Physico-chemical analysis

INTRODUCTION

Since evolution, man has been a thinking animal. His ability to think and rationalize the knowledge has guided him to both discover and invent innumerable remedies for common and serious ailments from the flora and fauna found around him. The quest for greater formulations might have led to the development from single drug therapy to compound drug therapies. Sneha kalpana is a secondary preparation derived from both Kashaya kalpana and Kalka kalpana. It is the process where the active principles present in the drug are extracted with the Sneha (Ghee or Oil) during the pharmaceutical process. The intention of doing the paka for specific number of days may be for the better transfer of the active principles of the drug into the oil and to increase its potency. Acharya Sharangadhara has mentioned not to complete Guda paka, Taila paka and Ghrita paka in a single day¹.

Nirgundi taila samples were prepared using Nirgundi patra swarasa as Drava dravya and completed in 1 day, 2 days, 3 days and coded as N.T.S1, N.T.S2 and NTS3 respectively for easy understanding. Vaidyaka Paribasha Pradeepa (3/26, 27) has mentioned to complete taila paka in 3 days having Swarasa as Drava dravya².

Aims and Objective of the study

- To prepare Nirgundi taila by adding Nirgundi patra swarasa as Drava dravya and doing the Sneha paka for 3 days, 2 days and 1 day respectively.
- Physico- chemical analysis of the prepared samples.
- To determine whether the prepared oil samples have any difference in the obtained values.

MATERIALS AND METHODS

Pharmaceutical Study

Nirgundi (*Vitex negundo* Linn.), the raw drug needed for the preparation of Nirgundi taila, was collected from the surroundings of Moodabidri and the drug was certified by

Botanist before the preparation of the medicine. Good quality Nirgundi patra was collected and cleaned well. The leaves were crushed and put in a mixer grinder to extract the Swarasa. The obtained juice was filtered using a clean cloth. To extract one liter of Swarasa, about 10 kg of Nirgundi patra was used.

Tila taila for doing the practical was of highest quality, purchased in a sealed packet.

Practicals were done by adding Nirgundi moola and patra Kalka to the Sneha and Nirgundi patra swarasa as Drava dravya in the ratio of 1/8: 1: 4 parts respectively³.

Procedure

- Good quality Nirgundi patra was taken in mixer grinder to extract the Swarasa.
 - Tila taila was taken in a clean vessel and slightly heated.
 - Nirgundi Kalka was added to the heated oil followed by Swarasa.
 - Heating was done over mild fire using gas stove with continuous stirring of the mixture using a spatula to prevent sticking of the Kalka to the bottom of vessel.
 - The mixture was heated in mandagni till Taila paka lakshanas were observed.
 - The obtained oil was filtered using a clean cloth.
 - The oil was stored in a glass jar after complete cooling.
- In case of oil prepared in 1 day it was named as N.T.S1. Similar method was followed to prepare and complete the oil samples in 2 days (N.T.S2) and 3 days (N.T.S3). The oil samples were later subjected to the below mentioned analysis and the results were tabulated (Table No .01).

- Specific gravity
- Refractive Index
- pH Values
- Loss on drying at 110°C
- Acid value
- Saponification value

- Iodine value
- Ester value
- Unsaponifiable Matter

RESULTS⁴

Specific gravity: The Specific gravity of the sample N.T.S1 was 0.9581, N.T.S2 was 0.9613 and N.T.S3 was 0.9636 against the Specific gravity of 0.9169 of normal sesame oil. The addition of the thick Swarasa and the Kalka dravya to the oil during the paka has made the samples thicker. Hence the Specific gravity of all the samples has increased after the paka.

Refractive index: The Refractive index of the sample N.T.S1 was 1.473, N.T.S2 was 1.472, N.T.S3 was 1.472 against the Refractive index of 1.462 of normal sesame oil. The minute particles of the leaf in the Swarasa and Kalka dravya have slightly increased the Refractive index of the prepared samples.

pH Value: The pH of the sample N.T.S1 was 3.83, N.T.S2 was 3.84, N.T.S3 was 4.08 against the pH of 4.90 of the normal oil sample indicating that the prepared sample was more acidic than the normal oil. The addition of concentrated Nirgundi patra swarasa in the form of Drava dravya to the oil and its reaction with the oil and the Kalka dravya may have turned the sample more acidic than the normal oil.

Loss on drying at 110°C: Loss on drying at 110°C of the sample N.T.S1 was 0.086%, N.T.S2 was 0.093%, and N.T.S3 was 0.077% against the normal oil's reading of 0.0838%. The readings are below the accepted reading of <1% indicating that the sample has been properly prepared, devoid of any water content in it. Even the normal oil did not contain any water residue in it.

Estimation of free fatty acids (acid value): The acid value of the prepared sample N.T.S1 was 2.171, N.T.S2 was 3.383 and N.T.S3 was 3.384 against the acid value of 3.862 of the normal oil. The addition of Swarasa as Drava dravya may have slightly decreased the acid value of the sample.

Determination of Saponification value: The Saponification value of the prepared sample N.T.S1 was 186.155, N.T.S2 was 186.845 and N.T.S3 was 188.240 as against the value of 185.549 of normal oil. There is slight increase in the values as the number of days of paka increases indicating the increase in the fatty acid chain length.

Determination of Iodine value: In this study, the obtained Iodine value of the prepared sample N.T.S1 was 87.45, N.T.S2 was 82.60 and N.T.S3 was 78.37 against the value of 109.08 of normal oil. This suggests fewer amounts of unsaturated fatty acids in the prepared sample. The absence of any fat containing Drava dravya and addition of Nirgundi patra swarasa which is devoid of any fatty acid might be the reason for the low Iodine value.

Ester value: The Ester value of the prepared sample N.T.S1 was 98.705, N.T.S2 was 104.245 and N.T.S3 was 109.870 as against the value of 76.469 of normal oil. These values are dependent on the Saponification value and the iodine value obtained.

Unsaponifiable value: In this study, the obtained Unsaponifiable value of the prepared sample N.T.S1 was 0.754 % w/w, N.T.S2 was 0.758% w/w and N.T.S3 was 0.766% w/w against the value of 0.631% w/w of normal oil.

DISCUSSION

According to Vaidyaka Paribasha Pradeepa 3/26, 27, when different Drava dravyas are used in a Sneha kalpana

preparation, they require different number of days of paka for completion. When the Drava dravya used is Swarasa, the paka should be completed in 3 days. Nirgundi taila as said in Charaka Samhita Chikitsa Sthana 28/134 was selected for preparation. The intention behind selecting this formulation was that it is a simple preparation where, only Nirgundi is used as a single drug along with Tila taila as the base. Nirgundi is also available easily in the place (Moodabidri, Karnataka) where the study was carried. Moreover a clear picture of the various physical and chemical parameters may emerge if a formulation contains only a single predominant drug. The intention of the study was to analyze the different samples of Nirgundi taila by chemical analysis and to rationalize the fact whether the tailas can be completed in reduced number of days, attaining the same chemical values. The parameters taken during the study provided information about the nature of the prepared samples. Its comparative value against the normal oil was analyzed to get a better view about the changes occurring in the respective prepared sample after the addition of various Drava dravya and completion of the paka.

In the test of Specific gravity all the prepared samples were denser than the normal oil due to the addition of the Drava dravya in various forms. This result is substantiated, as addition of any liquid media will thicken the oil and make it heavier and little thicker.

In Refractive index N.T.S1 had the highest value with 1.473 as compared with 1.462 of the normal oil. The pH of the normal oil taken was 4.9. After the addition of the Drava dravya, the samples became more acidic after the paka. But increase in number of days of the paka increases the acidity level of the pH in all the 3 prepared samples. All the prepared samples had <1% Loss on drying at 110°C value, indicating that the moisture content in the sample was within acceptable range. This suggests that the samples had been prepared properly till the paka lakshanas were observed. The shelf life of the sample is enhanced if there is absence or very little moisture content in the sample. In the test of acid value it is observed that immediately after the addition of the Drava dravya and if the paka is done for less number of days, the acid value is brought down. The acid value of the normal oil was 3.862 whereas that of that of N.T.S1 was 2.171. But as the sample was exposed to more quantum of heat, the acid value of the sample increased like in N.T.S3, acid value was 3.384. The Saponification value also increased gradually as the number of days of paka was increased. The Iodine value determines the shelf life of a sample⁶. Lower the Iodine value, better shelf life is expected of the sample. In all the samples it is observed that as the paka was continued for more number of days the Iodine value decreased. It can be said that definitely there are changes in the values of physical and chemical tests done in the samples. The changes appear minimal in some cases whereas distinctive changes are observed in other samples. There is difference also in values from the obtained samples when compared with the normal oil in majority of the tests.

The view of the ancient Acharyas about not completing the paka in a single day has got reason. The opinion of Vaidyaka Paribasha Pradeepa about completing the paka in different number of days depending upon the Drava dravya is justified.

CONCLUSION

The study reveals that there are significant changes in the values of physical and chemical tests done in the samples. The changes appear minimal in some cases whereas distinctive changes are observed in other samples. There is difference in values from the obtained samples when compared with the normal oil also in majority of the tests. Hence the study substantiates the necessity of certain period of time to prepare the particular kind of oil added with a definite type of drava dravya, mentioned in the classical literatures. Also the efforts carried to reduce the number of

days, as practiced in Ayurvedic industries now-a-days, may not yield a saturated/potent medicated oil.

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Table 1- Results of the various physico chemical analysis

Analysis	Normal Oil	N.T.S1	N.T.S2	N.T.S3
Specific Gravity	0.9169	0.9581	0.9613	0.9636
Refractive Index	1.462	1.473	1.472	1.472
pH value	4.90	3.83	3.84	4.08
Loss on drying at 110°C	0.0838%	0.086%	0.093%	0.077%
Acid value	3.862	2.171	3.383	3.384
Saponification value	185.549	186.155	186.845	188.240
Iodine value	109.08	87.45	82.60	78.37
Ester value	76.469	98.705	104.245	109.870
Unsaponifiable value	0.631% w/w	0.754 % w/w	0.758% w/w	0.766% w/w

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