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COMPARATIVE STUDY OF PHARMACEUTICAL ANALYSIS OF PRATHAMAVARATANI AND DASHAVARATANI NIRGUNDI-ERANDA TAILA

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Abstract : *Siddha Sneha* is largely preferred in clinical practice by Ayurvedic clinicians because of their improved quality and efficacy; however, faces the problem of patient compliance which needs to be tackled. *Avartani* is the process of repetition of the *Siddha Sneha procedure* to potentiate the formulation and decrease the need for high dose requirements. The decrease in the need for dose requirements can help manage compliance with *Siddha Sneha* intake with no changes in efficiency and quality of *sneha*. The reference from *Rasa ratna samucchaya adhyay* 21 mentions *Nirgundi-eranda taila* for *sandhigata vata, katigata vata*, and *kampavata*. The process of *avartani* was adapted and *dashaavartani* was performed. The pharmaceutico-analysis was performed on *eranda taila, Prathamavartani nirgundi-eranda taila* and *dashavartani nirgundi-eranda taila*. The analysis revealed that the *dashavaratani nirgundi-eranda taila* is more efficient and has superior quality as compared to the rest of the samples. The *Sneha avartani* review articles also overviewed and discussed.

Keywords: *Avartani, dashavartani, nirgundi-eranda taila,* pharmaceutico-analysis, *Sneha siddhi, eranda taila, nirgundi*.

I. INTRODUCTION:

Pharmaceutical analysis is the branch of analytical chemistry that focuses on the evaluation and characterization of pharmaceutical products. The pharmaceutical analysis is to ensure the quality, safety, and efficacy of pharmaceutical substances, drug formulations, and medical devices. It also helps in the drug development process, from research and development to manufacturing and post-market surveillance. Comparison of the pharmaceutical analysis of *Prathamavaratani* and *Dashavaratani nirgundi-eranda taila* along with eranda taila to rule out the efficacy and quality parameters. *Nirgundimula churna*, (L.N: Vitex negundo) along with *eranda taila*, (L.N: Ricinis communis) is useful in *kampavata*, *sandhivata*, and *kativata* according to the reference of *Rasa Ratna Sammucchay adhyaya 21*, *vataroge samanyopaya* (21/164), *shlok* 164.[i]

निर्गुण्डीमूलचूर्णे तु कर्ष तैलेन लैहयेत् ।
सन्धिवातः कटीवातः कम्पवातश्च शाम्यति ॥१६४॥

The meaning of the term *avartana* is repetition,[ii] doing over and over again,[iii] stirring or churning any substance.[iv] This is aimed to enhance the properties by the process of repetition.[v] In case of *siddha sneha* (medicated oil/ghee or fat based preparations), the process of *avartana* is termed as '*paka*' (heating). During *avartana* in making of *siddha sneha* each time ingredients are added in *kalka* and/or *drava dravya* form and the *paka* is carried out. It alters the amount of active compounds of formulae as during every *avartana* some phytochemicals from added *kalka dravya* and *drava dravya* may get extracted into the *sneha*. The process is repeated without adding more *taila* or *ghrita*. Thermogenic effects in each *paka* may break/degenerate and simplify the compound of the medicaments and may help to provide a maximum surface area of absorption, thereby maximizing the bio-availability.[vi] In ayurvedic clinical practice utilizing *siddha ghrita* for therapeutic purposes, poor compliance to the medicated *sneha* was noted due to its strong odour and bitter taste.[viiviiiixxxi] Avartana is proposed to be a promising method leading to the potentiation of formulation eventually reducing its dose requirements which may help get better compliance. The review brings the facts about *sneha avartana* from classical texts of Ayurved and recently published primary data. It suggests that serious research is needed in this area which can help understand the mechanism of *avartana* through its effects on the formulations and their efficacy. It will ultimately help reduce the dose to make them more convenient for use.

2. Aim:

To rule out the difference in quality in *prathamavartini* and *dashaavartani* by pharmaceutical analysis.

3. Objectives:

3.1. To prepare *Nirgundi-eranda taila* as per *avartani* procedure.

3.2. To conduct pharmaceutical analysis performed of *prathampaki nirgundieranda taila, dashapaki nirgundi eranda taila,* and *eranda taila*.

4. Materials and methods:

4.1 Pharmaceutical study:

i. Raw materials *(Nirgundimula bharad, nirgundi churna, and Eranda taila)* was procured from authentic vendor (GMP approved pharmacy).

ii. The formulation was prepared by *avaratani* procedure and reference was taken from *Rasa Ratna Samucchay (Adhyay 21, vataroge samanyopaya, shlok no.164)*. Total 10 *avaratani* was performed. The preparation was performed at Dr. D. Y. Patil College of Ayurved and Research Centre, Pimpri, Pune-18.

4.2 Analytical study:

Analytical study was carried out on *prathamavartani, dashaavartani nirgundi-eranda taila,* and *eranda taila* at Sudhatatva's Quality control department at Dr. D. Y. Patil College of Ayurved and Research Centre, Pimpri, Pune-18.

Procedure:

The preparation of *dashaavaratani nirgundi eranda taila* was perfomed by *avartani* procedure which was repeated for 10 times. Every time fresh *nirgundi kwatha* and *nirgundi kalka* was taken for each *avartani*. The calculations of the required *kwatha* and *kalka* for each time were dependent on the amount of *Nirgundi-eranda taila* extracted after each procedure. The calculation was 1 part of *taila* (oil), 4 parts of *kwatha* (decocotion), and 1/4th part of quantity of *churna* (powder) taken for preparation of *kalka* (poultice). Table 1. Represents the data of the oil remaining after each procedure, *kwatha* prepared, and *kalka* quantity required each time after preparation.

Table 1: Preparation chart of *Dashavaratani nirgundi-eranda taila*

Sr. no.	Eranda taila	Nirgundi bharad kashaya	Nirgundi churna kalka	Quantity of eranda left after each paka	Quantity lost
1.	2000 ml	8000 ml	500 gm	1850 ml	150 ml
2.	1850 ml	7200 ml	450 gm	1750 ml	100 ml

3.	1750 ml	7000 ml	437.5 gm	1600 ml	150 ml
4.	1600 ml	6400 ml	400 gm	1500 ml	100 ml
5.	1500 ml	6000 ml	375 gm	1400 ml	100 ml
6.	1400 ml	5600 ml	350 gm	1330 ml	70ml
7.	1330 ml	5320 ml	332.5 gm	1200 ml	130 ml
8.	1200 ml	4800 ml	300 gm	1120 ml	80 ml
9.	1120 ml	4480 ml	280 gm	1030 ml	90 ml
10.	1030 ml	4120 ml	257.5 gm	960 ml	80 ml

Procedure outcome:

i.The total yield post dasha avartani was 48% (960 ml) and percentage loss due to repeated procedures was 52% (1040 ml).

ii. The avartani procedure was carried out on slow flame to limit the extensive loss of oil during the paka.

iii.Everytime the nirgundi kwath and nirgundi churna for kalka was taken fresh for each avartani.

Sneha siddhi lakshana was monitored post each avartani. (See fig.1 and fig.2)

Fig.1. Shabda hina agni nikshipta.

Fig. 2. Varti of kalka.

Table 2: Comparison of pharmaceutical analysis of *eranda taila, prathamavartani nirgundi-eranda taila, dashavartani nirgundi-eranda taila*.

Sr. no.	Parameter	*Eranda taila*	*Prathamavartani nirgundi-eranda taila*	*Dashamavartani nirgundi-eranda taila*
1.	Description: Colour- Odour- Flowability-	Faint yellow Characteristic Freely flowable	Yellowish brown Characteristic Freely flowable	Yellowish brown Characteristic Less flowable
2.	Specific gravity	0.959 gm/ml	0.99 gm/ml	0.95 gm/ml
3.	Refractive index	1.4788	1.3972	1.3752
4.	Weight per ml	0.95 g/ml	0.95 g/ml	0.91 gm/ml
5.	pH	6.86	6.30	6.37
6.	Viscosity (mPa.s) At 60 RPM	230.1 mPa.s	483.3 mPa.s	681.4 mPa.s
7.	Rancidity	No pink coloration	No pink coloration	No pink coloration
8.	Acid value	3.53	1.62	0.28
9.	Saponification value	198.1	192.1	188.2
10.	Iodine value	84	81.6	78.4

5. Discussion

Saptavartita Hingusauvarchaladi ghrita has shown better anticonvulsant activity in comparison to *Hingusauvarchaladi ghrita*.[xii] The study established that drug potentiation increases the efficacy of the drug and thus drug dose can be reduced and the drug can be dispensed in a better and palatable form like soft gel capsules.[xiii] In this modern era, people expect quicker relief from ailments. To meet this expectation we should have highly potent formulations. By doing *Avaratana*(repeated processing), it helps physicians to minimize the dose and easy to administer.[xiv]

6. Conclusion

As per the pharmaceutical analysis performed, the study reveals that the *dashampaki nirgundi-eranda taila* has better quality when compared to *prathampaki nirgundi-eranda taila* and *eranda taila*. The acid value, saponification value and the iodine value tend to fall in *dashavartani taila* when compared to *prathamavartani* and *eranda taila*. The viscosity increases significantly in *dashamavartani taila* and is less flowable. Due to the repetition process, the formulation is effective for *indriyadridhatwa* (enhancement of functional longevity of all sense organs), *brimhana* (enhancement of strength and vitality), and as tissue nutrients. *Avartita taila* is recommended in the treatments of *vatavyadhi, mahavatavyadhi, vatashonita, moodhagarbha, karnagataroga, granthi-apachi-arbuda-galaganda, vandhyatwa,* and *yonivyapat*.[xvxvixviixviiixixxxxxixxii]

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