

# A STUDY ON *TAILA MURCHANA* WITH A COMPARATIVE ANALYSIS OF *PANCHA PALLAVA MURCHITA* *TILA TAILA* , *MANJISHTAADI YOGA* *MURCHITA TILA TAILA* AND *AMURCHITA TILA TAILA*

Dr. EBIN T U<sup>1</sup>, Dr. BILMA P S<sup>2</sup>

<sup>1</sup> Assistant Professor, Department of Rasashastra and Bhaishaja Kalpana , Parul Institute of Ayurved  
, Vadodara , Gujarat, India

<sup>2</sup> Scientific Officer (Rtd), Drug Testing Laboratory, Govt Ayurveda College, Thiruvananthapuram, Kerala,  
India

## ABSTRACT

'*Sneha Kalpana*' is a dosage form in Ayurveda where fats and oils are processed with suitable drugs for internal and external use. '*Murchana*' is the initial processing of *Sneha Kalpana* with prescribed groups of herbs. *Murchana* ensures increased potency and enhanced shelf life. In the present work a comparative study of *Murchana* of *Tila Taila* (Sesame oil) with *Panchapallava* group of drugs (PMT), and *Manjishta* group of drugs (MMT) was prepared. Both were undergone Physico-chemical analysis based on designated parameters and compared with the evaluated parameters of *Amurchita Tila Taila* (Plain sesame oil) (ATT). With respect to the physical parameters, all the three samples revealed about same values in Specific gravity and Refractive Index. Moisture content of MMT was the least compared to other two samples. Regarding chemical parameters, Acid value of PMT and ATT were almost contiguous. The one undergone *Murchana* with *Manjishta* group of drugs exhibited a greater value. Saponification value was significantly altered in both PMT and MMT compared to ATT. Similarly Iodine value of PMT and MMT had a significant variance with respect to ATT. The above work assures that *Murchana* is essential for every *Sneha Dravya* before incorporating in every formulation. This may help to attain and maintain optimum physico-chemical parameters of fats and oils. It also hinders the oxidation process in fats and oils and thereby enhances its shelf life. Both the samples of *Murchita Tila Taila*, showed optimum results with respect to the evaluating parameters, compared to *Amurchita Tila Taila*. Based on the overall outcome *Panchapallava* group of drugs has an ascendancy in optimizing the pharmacopeal standard parameters of *Sneha Kalpana* compared to *Manjishtadi* group of drugs. The study also underlines the use of *Panchapallava* in *Sneha Murchana* which is uncommon.

**Keywords:** *Murchana*, *Panchapallava*, *Manjishtadi Yoga*, *Specific gravity*, *Refractive index*, *Moisture content*, *Acid value*, *Iodine value*, *Saponification value*.

## 1. INTRODUCTION

*Sneha Kalpana* is an important dosage form in Ayurveda which incorporates the use of substances like ghee, oil, fats for external and internal use. A drug processed with these substances is supposed to have increased absorption and improved shelf life compared to basic classical preparations. For the passive absorption of a drug from the site to systemic circulation, it should be lipid soluble [1]. Research works based on classical *Guggulutikta Grita* have proved that *Sneha Kalpana* is a complex pharmaceutical dosage form containing predominantly polar active bioingredients incorporated into the fats which forms the lipid base (Duraipandi et al) [2]. The shelf life of processed *Sneha* is considered as sixteen months according to *Acharya Sarangadhara* [3] compared to *Panchavidha Kashaya Kalpana* which last for a few hours. *Murchana* is carried out in raw oils and fats where prescribed drugs taken in the form of *kalka* (bolus) is processed in the former. *Murchana* is advised as mandatory for all *Sneha* before using in any formulation. [4] Reference of *Sneha Murchana* is available in *Bhaishajya Ratnavali*, *Jwara Roga Adhikara*. *Murchana* of *Gritha* (Ghee) [5], *Tila Taila*[6] (*Sesame oil*), *Katu taila*[7] (*Mustard oil*), *Eranda taila*[8] (*Castor oil*) is well explained in this context. Two different methods of *Taila Murchana* are explained in *Gudartha Deepika Vyakhyana* of *Sarangadhara Samhitha* by *Sri Kashi Ramavaidhya* [9], which are actually quoted from different classical references. In another work, *Navaparibhasha* by *Kaviraj Upendranatha Dasa*, similar description of *Grita*, [10], (*Tila*) *taila* [11] and *Katu taila*[12] *Murchana Vidhi* is seen.

### 1.1 Rationale of the study

Two methods of *Taila Murchana* was taken into concern for this study. *Taila Murchana* from the references of *Bhaishajya Ratnavali* which is accepted by the authors and commentators of later period is generally followed. While the further manner, which is simpler with regard to ingredients and processing duration seems to be left unnoticed. Moreover, among the two *Murchana* methods, the outstanding one is not yet discriminated, pertaining to the pharmacopeal parameters of *sneha*. Therefore a comparative analysis on *Murchita Taila* with the described two methods is necessary. An analytical study based on certain pharmacopeal standard parameters of *Sneha Kalpana* should be adopted. This study is also expected to clarify the influence of *Murchana* in optimizing the pharmacopeal parameters of *Sneha Kalpana* and thereby altering its characteristics and promoting shelf life.

## 2. METHODS

In the present study, *Tila Taila* (Sesame oil) *Murchana* was carried out based on two references. Initial method was adopted based on the descriptions from *Gudartha Deepika* commentary, where *Panchapallava* is used as drugs for *Murchana*. [13] The second method of *Murchana* was carried out using *Manjishta* group of drugs based on the reference from the book *Navaparibhasha*. [14] A comparative physico-chemical analysis of *Murchita Tila Taila* prepared using *Pancha Pallava Yoga*, (sample 1) and *Manjishtaadi Yoga*, (Sample 2) with the evaluated parameters of *Amurchita Tila Taila*, (sample 3). The study was set at Government Ayurveda College, Thiruvananthapuram, Kerala. The descriptions of each *Murchana* method are as follows:

### 2.1 FIRST METHOD

#### Preparation of *Murchita Taila* using first method

Raw sesame oil was purchased from the local market in Thiruvananthapuram. The five *Pallava* (tender leaves) were collected from various sites of Thiruvananthapuram. In line with reference the whole *Kalka dravya* constitutes 1/32 part of *taila*. But following the guidelines from *Sarangadhara Samhita Paribhasha*, while adding fresh drugs, the quantity should be doubled with regard to the prescribed measure for the preparation [15]. Therefore the measurement of *kalka dravya* should be 1/16 part of *taila*. Tender leaves were manually grinded one by one in stone mortar with pestle and made into fine paste. This was weighed to needed quantity and then mixed together. This mixed *kalka dravya* was then thinned in 300 ml water and finally added to 300 ml *taila* taken in a vessel and prepared till attaining '*Mridupaka*'. On attaining *Mridupaka* the *taila* was filtered and stored. Thus *Murchana* was carried out. The resultant product weighed 300 ml.

**Table 1.** Ingredients and quantity used to prepare *Panchapallava Murchita Tila taila* for the study

Ingredients	Botanical name	Family	Measure	Proportion
Amra	Mangifera indica	Anacardiaceae	3.75 gm	1/16 part of taila
Jambu	Syzygium cumini	Myrtaceae	3.75 gm	1/16 part of taila
Kapitha	Feronia linonia	Rutaceae	3.75 gm	1/16 part of taila
Beejapooraka	Citrus medica	Rutaceae	3.75 gm	1/16 part of taila
Bilwa	Aegle marmelos	Rutaceae	3.75 gm	1/16 part of taila
Water	-	-	300 ml	1 part
Sesame oil	Sesamum indicum	Pedaliaceae	300 ml	1 part

## 2.2 SECOND METHOD

In *Navaparibhasha*, the description about *Taila Murchana* is very similar to the reference of *Bhaishajya Ratnavali*. But here the author has more obviously described the procedure of *Murchana*. Prescribed quantity of raw *taila* should be taken in a suitable vessel. It must be heated till the oil is free from froth. Once *taila* attains the stage of '*Nishphena*' (absence of froth), [16] it is allowed to cool by its own. To this cool oil the *Kalka dravya* and water are added and prepared. Processing is continued till the *taila* alone remains ('*Taila matram yatha shishtam*') [17].

### Preparation of *Murchita Taila* using second method

*Kalka dravya* were powdered and weighed individually. They were mixed together and grinded in a stone mortar using pestle till it attains a soft butter like consistency. This *kalka* was thinned in 1200 ml water and added to 300 ml *taila* taken in a suitable vessel. The entire mixture is done *Paka* in *Mandagni* till the water got completely evaporated (*Madhyama Paka*). The resulted product was filtered and stored. The final product was 275 ml.

**Table 2.** Ingredients and quantity used to prepare *Manjishtaadi Yoga Murchita Tila taila* for the study

Ingredients	Botanical Name	Family	Measure	Measure
Manjishta	Rubia cordifolia	Rubiaceae	18.75 gm	1/16 part of <i>taila</i>
Haridra	Curcuma Longa	Zingiberaceae	4.7 gm	1/64 part of <i>taila</i>
Harithaki	Terminalia chebula	Combretaceae	4.7 gm	1/64 part of <i>taila</i>
Vibhithaki	Terminalia bellerica	Combretaceae	4.7 gm	1/64 part of <i>taila</i>
Amalaki	Emblica officinalis	Phyllanthaceae	4.7 gm	1/64 part of <i>taila</i>
Lodhra	Symplocos racemosa	Phyllanthaceae	4.7 gm	1/64 part of <i>taila</i>
Kethaki	Pandanus odorife	Pandanaceae	4.7 gm	1/64 part of <i>taila</i>
Musta	Cyperus rotundus	Cyperaceae	4.7 gm	1/64 part of <i>taila</i>
Valaka	Coleus vettiveroides	Lamiaceae	4.7 gm	1/64 part of <i>taila</i>

Vata (Vataangri)	Ficus benghalensis	Moraceae	4.7 gm	1/64 part of <i>taila</i>
Naalika	Cinnamomum Zeylanicum	Lauraceae.	4.7 gm	1/64 part of <i>taila</i>
Sesame oil	Sesamum indicum	Pedaliaceae	300 ml	1 part
Water	-	-	1200 ml	4 part

### 2.3 ANALYTICAL STUDY

3 samples were used for analysis which were conducted in Drug Testing laboratory and Drug Standardization Unit, Government Ayurveda College, Thiruvananthapuram. Parameters were represented as follows.

- a) **Specific Gravity:** The specific gravity of a liquid is the weight of a given volume of a liquid at 25 degree (unless otherwise specified) compared to the weight of an equal volume of water at the same temperature, all weighing being taken in air. [18]

$$\frac{\text{Weight of sample 1/Sample 2/ Sample 3 (Taken in specific gravity bottle)}}{\text{Weight of distilled water (Taken in specific gravity bottle)}}$$

- b) **Acid value:** The acid value is the number of mg of Potassium hydroxide required to neutralize the free acids in 1 gm substance [19]

$$AV = \frac{56.1(\text{Molecular weight of KOH}) \times 0.108 (\text{Normality of KOH}) \times \text{Titre Value}}{W_s (\text{Weight of Sample 1/ Sample 2/ Sample 3})}$$

Titre value denotes the value obtained by mixing the prescribed quantity of sample added with equal volume of ethanol and ether, further with 2 drops of phenolphthalein indicator, and titrated against 0.1N KOH solution for a permanent pink color as end point

- c) **Refractive index / Index of Refraction:** The refractive index (n) of a substance with reference to air is the ratio of the sine of the angle of incidence to the sine of refraction of a beam of light passing from air into the substance [20]. For detecting the RI value, Refractometer was used.

- d) **Saponification value:** Saponification value is the number of mg of Potassium hydroxide required to neutralize the fatty acids, resulting from the complete hydrolysis of 1 gm of the oil or fat. [21]

$$SV = \frac{56.1(\text{Molecular weight of KOH}) \times 0.3(\text{Normality of acid}) \times \text{Titre value}}{W_s (\text{Weight of samples})}$$

Titre Value denotes Volume of 0.3 N HCL titrated against 3percent ethanolic solution of KOH diluted with distilled water and added with 2 drops of phenolphthalein indicator

- e) **Moisture content:** A small amount of a liquid (such as **water**) that makes something wet or moist [22].

- f) **Iodine value:** The Iodine value of a substance is the weight of iodine absorbed by 100 part by weight of the substance (oil or fat) [23].

$$IV = \frac{12.69 \times \text{Titre Value} \times 0.1 (\text{Normality of Sodium thiosulphate})}{W_s (\text{Weight of the sample})}$$

12.69 is the conversion factor from mEq sodium thiosulfate to grams of iodine)

Titre value denotes the difference between the test value (standardized sodium thiosulphate titred against mixture of Sample, carbon tetra chloride and Iodine mono chloride with phenolphthaliein as indicator) and blank value where the titration is carried out without sample (standardized sodium thiosulphate titred against mixture Carbon tetra chloride and Iodine mono chloride with phenolphthaliein as indicator).

### 3. RESULTS

Among the physical properties, both *Murchita Taila* samples exhibited their characteristic Odour. Specific gravity and Refractive index revealed no significant variance among the three samples. Acid value showed substantial variance between sample 1 and sample 2, sample 2 and sample 3. Whereas acid value of sample 1 and sample 3 showed negligible variance. The acid value appeared to be lowest in sample 2 compared to other two samples. While analyzing the moisture content, sample 2 (which was accomplished in *Madhyama Paka*,) showed very less moisture content, compared to sample 1 (which was processed in *Mridu Paka*) and sample 3. Sample 1, even though taken in *Mridu Paka* showed nearly fifty percent less moisture content than raw sesame oil. Moisture content of sample 2 was nearly 75 percent less compared to raw sesame oil. Saponification value was considerably altered in both sample 1 and sample 2 compared to sample 3. Saponification value of raw sample was more and beyond the standard limits. However sample 1 and sample 2 expressed saponification values within the standard limits. Iodine value of sample 1 and sample 2 had a notable variance compared to sample 3. Sample 2 and sample 3 expressed an iodine value, which was below the standard normal limits.

**Table 3.1** Physico - Chemical analysis of the samples and its characteristics.

Sl.No	Parameters	Sample 1	Sample 2	Sample 3
1.	Colour	Green	Red	Amber
2.	Odour	Characteristic odour	Characteristic odour	Characteristic odour
3.	Appearance	Viscous	Viscous	Viscous
4.	Touch	Oily	Oily	Oily

**Table 3.2** Physico - Chemical analysis of the samples and its characteristics.

SL.NO	PARAMETERS	SAMPLE 1	SAMPLE 2	SAMPLE 3
1.	Specific gravity	0.9170	0.9163	0.9160
2.	Refractive index	1.467	1.467	1.468
3.	Acid value in mg/gm	4.42	3.6	4.37
4.	Acid value mg/gm in terms of oleic acid	2.22	1.8	2.19
5.	Saponification value	190.47	193.42	203.07
6.	Moisture content in percentage	0.0137	0.0040	0.0265
7.	Iodine value	104.37	90.99	87.20





Panchapallava Murchita

Fig -1 Tila Taila -Sample 1

Manjishtaadi Yoga  
Murchita Tila Taila -  
Sample 2Amurchita Tila Taila -  
Sample 3

#### 4. DISCUSSION

*Murchana* may be deduced as a process of refinement, where the raw fats and oils are made fit to use in any formulation, either for internal or external use. *Sneha dravya* like *taila*, after extraction or *Grita*, after production should be stored for a quite long period. Therefore, these substances should be prevented from physical or chemical changes. In the pharmaceutical phase, while preparing sample 1, the quantity of *Kalka* was used based on '*Suskha-Ardhra Niyama*' (Wet Drug -Dry Drug Role) described in *Sarangadhara Samhita*. As per the rule, for every fresh drug, the quantity should be doubled with respect to the prescribed proportion. In the preparation of sample 2, an initial heating of *taila* has been advised. This may be meant to remove the water content in the raw oil. Oil was then allowed to cool before commencing the actual *Paka Karma*, which may prevent the reformation of froth while adding water in the hot oil. Moreover, water as liquid, medium is not mentioned in the reference, which is also adopted from the general rule by Sarangadhara [24]. The duration of *Paka* was mentioned as '*Taila Maatram Yathaa Shishtam*'. This is considered as *Madhyama Paka*. The appearance of *Kalka* in *Madhyama Paka* is described as '*Neerasakomala*', [25] i.e. devoid of water content and soft in touch.

Acid value is an indicator of oxidation in fats and oils due to the free acids present. The group of drugs used for processing sample 2 should have a higher influence in reversing the oxidative process of the fatty acids. The moisture content promotes the rancidity of oil [26]. Subsequently through *Murchana*, the moisture content was considerably reduced in both sample 1 and sample 2. Therefore, to check the rancidity of *taila*, *Murchana* is definitely beneficial. *Murchana* possibly acts as a refining mechanism which may in turn extend the life span of raw fats and oils. Saponification value indicates the average molecular weight of fatty acids. Higher the saponification value, lower the weight of fatty acids [27]. Iodine value indicates the degree of unsaturation in oil, [28] which in turn reflects the oxidative mechanism. It points to the quantity of unsaturated fatty acids. Even though the Iodine value of sample 1 was increased compared to other samples, it was the only one within the standard limits of expressed refined grade sesame oil. (103-115) [29]. Increase in Iodine value, surges the edible quality of fats and oils, because fats and oils containing unsaturated fatty acids are recommended for edible purposes. Hence such *Murchita Sneha* may be beneficial for purposes like *Snehapana*. Thus *Murchana* can alter the saturation of fats and oils without fluctuating its stability.

#### 5. CONCLUSION

The present study was meant for reinforcing the importance of *Murchana* process before using any raw fats and oils for medicinal purpose. In Ayurvedic pharmaceuticals, *Murchana* is advised for raw fats and oils to ensure better shelf life. They should be prevented from the process of oxidation. Moisture content in fats and oils accelerates the route of rancidity. Hence *Murchana* helps to attain and maintain optimum physico-chemical parameters of *sneha dravya*. Raw fats or oils (both animal and vegetable) which are obtained from its source, is

more or less to be refined. Classical references regarding the outcome of *sneha Murchana* include removal of unpleasant odour, avoid the spoilage of *sneha*, provides reddish colour to oil (indicated under the context of *Tila Taila Murchana* by group of drugs commencing with *Manjishta* etc) [30]. *Murchana* offers comparatively long shelf life and better therapeutic usage of *sneha dravya*. Both the samples of *Murchita taila*, showed optimum results with respect to the evaluating parameters, compared to *Amurchita Tila Taila*. A minor dominance may be observed in *Panchapallava* murchitha *Tila Taila*.based on overall outcomes. Therefore it may be established that *Murchana* with *Panchapallava* group of drugs is also effective in optimizing the pharmacopeal standard parameters in concern with *Sneha Kalpana*. Role of Phytochemicals on both group of drugs in accomplishing the above mentioned results are yet to be studied.

## 6. ACKNOWLEDGEMENT

Author is acknowledged to Dr Parvathy Mohan, MD (Ayu), Dr Kiran Sarma MD (Ayu), Dr Anand S, MD (Ayu), for their support in fulfilling this work

## 7. REFERENCES

1. Brahmanekar, D.M, Jaiswal sunil, B. Biopharmaceutics and Pharmacokinetics – A treatise. (3<sup>rd</sup> ed.). Delhi: M K Jain- Vallabh Prakashan; 2019. Chapter 2.
2. Duraipandi S, Selvakumar V, Er NY. Reverse engineering of Ayurvedic lipid based formulation, ghrita by combined column chromatography, normal and reverse phase HPTLC analysis. *BMC Complement Altern Med*. 2015;15:62. Published 2015 Mar 13. doi:10.1186/s12906-015-0568-9
3. Pandita Sarangadharacharya, Dipika vyakhyana of Adamalla and Gudartha dipika vyakhyana of Kasirama. Sarangadhara Samhita. Varanasi: Chowkhamba KrishnadasAcademy; 2013.Pradhamakhanada, Chapter 1 sloka 52.
4. Sri Govindadas Sen , Dr Ravindra angadi. Bhaishajya Ratnavali, 'Transcendence' Descriptive English commentry- Part 1. (1 st ed.). Varanasi: Chaukhamba Surbharti Prakashan; 2018., Chapter 5, Sloka 264
5. Sri Govindadas Sen , Dr Ravindra angadi. Bhaishajya Ratnavali, 'Transcendence' Descriptive English commentry- Part 1. (1 st ed.). Varanasi: Chaukhamba Surbharti Prakashan; 2018., Chapter 5, Sloka 266-267
6. Sri Govindadas Sen , Dr Ravindra angadi. Bhaishajya Ratnavali, 'Transcendence' Descriptive English commentry- Part 1. (1 st ed.). Varanasi: Chaukhamba Surbharti Prakashan; 2018., Chapter 5, Sloka 268
7. Sri Govindadas Sen , Dr Ravindra angadi. Bhaishajya Ratnavali, 'Transcendence' Descriptive English commentry- Part 1. (1 st ed.). Varanasi: Chaukhamba Surbharti Prakashan; 2018., Chapter 5, Sloka 269-270
8. Sri Govindadas Sen , Dr Ravindra angadi. Bhaishajya Ratnavali, 'Transcendence' Descriptive English commentry- Part 1. (1 st ed.). Varanasi: Chaukhamba Surbharti Prakashan; 2018., Chapter 5, Sloka 271-272
9. Pandita Sarangadharacharya, Dipika vyakhyana of Adamalla and Gudartha dipika vyakhyana of Kasirama. Sarangadhara Samhita. Varanasi: Chowkhamba KrishnadasAcademy; 2013.Madhyamakhanada, Chapter 9 sloka 17-18 commentary.
10. Kaviraj Upendranatha dasa. Navaparibhasha. (3<sup>rd</sup>ed.). Chaukhamba Amarabharathi Prakashan; 1977, Dvitheeyakhanda, sloka 122-125.
11. Kaviraj Upendranatha dasa. Navaparibhasha. (3<sup>rd</sup>ed.). Chaukhamba Amarabharathi Prakashan; 1977, Dvitheeyakhanda, sloka 126-129.
12. Kaviraj Upendranatha dasa. Navaparibhasha. (3<sup>rd</sup>ed.). Chaukhamba Amarabharathi Prakashan; 1977, Dvitheeyakhanda, sloka 130-131.
13. Pandita Sarangadharacharya, Dipika vyakhyana of Adamalla and Gudartha dipika vyakhyana of Kasirama. Sarangadhara Samhita. Varanasi: Chowkhamba KrishnadasAcademy; 2013.Madhyamakhanada, Chapter 9 sloka 17-18 commentary.
14. Kaviraj Upendranatha dasa. Navaparibhasha. (3<sup>rd</sup>ed.). Chaukhamba Amarabharathi Prakashan; 1977, Dvitheeyakhanda, sloka 126-12
15. Pandita Sarangadharacharya, Dipika vyakhyana of Adamalla and Gudartha dipika vyakhyana of Kasirama. Sarangadhara Samhita. Varanasi: Chowkhamba KrishnadasAcademy;

- 2013.Pradhamakhanada, Chapter 1 sloka 46.
16. Kaviraj Upendranatha dasa. Navaparibhasha. (3<sup>rd</sup>ed.). Chaukhamba Amarabharathi Prakashan; 1977, Dvitheeyakhanda, sloka 126 ½.
  17. Kaviraj Upendranatha dasa. Navaparibhasha. (3<sup>rd</sup>ed.). Chaukhamba Amarabharathi Prakashan; 1977, Dvitheeyakhanda, sloka 128.
  18. Ayurveda Pharmacopea of India. (1<sup>st</sup> ed.). New Delhi: Ministry Of Health and Family Welfare Department of Ayurveda, Yoga & Naturopathy, Unani, Siddha and Homoeopathy, 2007. Part 2, Volume 1
  19. Ayurveda Pharmacopea of India. (1<sup>st</sup> ed.). New Delhi: Ministry Of Health and Family Welfare Department of Ayurveda, Yoga & Naturopathy, Unani, Siddha and Homoeopathy, 2007. Part 2, Volume 1
  20. Ayurveda Pharmacopea of India. (1<sup>st</sup> ed.). New Delhi: Ministry Of Health and Family Welfare Department of Ayurveda, Yoga & Naturopathy, Unani, Siddha and Homoeopathy, 2007. Part 2, Volume 1
  21. Ayurveda Pharmacopea of India. (1<sup>st</sup> ed.). New Delhi: Ministry Of Health and Family Welfare Department of Ayurveda, Yoga & Naturopathy, Unani, Siddha and Homoeopathy, 2007. Part 2, Volume 1
  22. Ayurveda Pharmacopea of India. (1<sup>st</sup> ed.). New Delhi: Ministry Of Health and Family Welfare Department of Ayurveda, Yoga & Naturopathy, Unani, Siddha and Homoeopathy, 2007. Part 2, Volume 1
  23. Ayurveda Pharmacopea of India. (1<sup>st</sup> ed.). New Delhi: Ministry of Health and Family Welfare Department of Ayurveda, Yoga & Naturopathy, Unani, Siddha and Homoeopathy, 2007. Part 2, Volume 1
  24. Pandita Sarangadharacharya, Dipika vyakhyana of Adamalla and Gudartha dipika vyakhyana of Kasirama. Sarangadhara Samhita. Varanasi: Chowkhamba KrishnadasAcademy; 2013.Madhyamakhanada, Chapter 9 sloka 9.
  25. Pandita Sarangadharacharya, Dipika vyakhyana of Adamalla and Gudartha dipika vyakhyana of Kasirama. Sarangadhara Samhita. Varanasi: Chowkhamba KrishnadasAcademy; 2013.Madhyamakhanada, Chapter 9 sloka 15.
  26. .Perera DN, Hewavitharana GG, Navaratne SB. Determination of Physicochemical and Functional Properties of Coconut Oil by Incorporating Bioactive Compounds in Selected Spices. J Lipids. 2020 Jul 28; 2020:8853940. doi: 10.1155/2020/8853940. PMID: 32774923; PMCID: PMC7407039.
  27. Amin MZ, Islam T, Mostofa F, Uddin MJ, Rahman MM, Satter MA. Comparative assessment of the physicochemical and biochemical properties of native and hybrid varieties of pumpkin seed and seed oil (Cucurbita maxima Linn.). Heliyon. 2019 Dec 8;5(12):e02994. doi: 10.1016/j.heliyon.2019.e02994. PMID: 31867464; PMCID: PMC6906666.
  28. Siddeeg A, Xia W. Oxidative stability, chemical composition and organoleptic properties of seinat (Cucumis melo var. tibish) seed oil blends with peanut oil from China. J Food Sci Technol. 2015 Dec; 52(12):8172-9. doi: 10.1007/s13197-015-1889-x. Epub 2015 Jun 12. PMID: 26604391; PMCID: PMC4648891.
  29. Indian standard specification for sesame oil. (2<sup>nd</sup>ed.). New Delhi: Bureau of Indian Standards;2000/2002
  30. Sri Govindadas Sen, Dr Ravindra angadi. Bhaishajya Ratnavali, 'Transcendence' Descriptive English commentry- Part 1. (1 st ed.). Varanasi: Chaukhamba Surbharti Prakashan; 2018., Chapter 5, Sloka 268


### Corresponding author

**Dr. EBIN T U**

Assistant Professor, Department of Rasashastra and Bhaishaja Kalpana, Parul Institute of Ayurved, Vadodara , Gujarat, India



## BIOGRAPHIES

<p>Corresponding Author</p> 	<ul style="list-style-type: none"><li>• Author pursued his Post graduation in Rasashastra and Bhaishajya Kalpana [MD (Ayu)] from Govt. Ayurveda College, Thiruvananthapuram.</li><li>• He began his teaching career for both undergraduate and Post graduate in Govt. Ayurveda college, Pariyaram, Kannur, Kerala</li><li>• Currently working in Parul Institute of Ayurved, Parul University (NAAC A++) as Assistant Professor with Undergraduate and Post Graduate teaching.</li><li>• Author has also worked as Medical officer in Ashtavaidhya Thrissur Thakkattu Mooss, SNA Ayurveda Nursing Home, Kerala</li></ul>
---	--

