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GANDHAKADYA MALAHARA AND ITS MODIFICATION WITH *INGUDI TAILA*: A COMPARATIVE PHARMACEUTICAL STUDY

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ABSTRACT

Introduction: *Malahara Kalpana* comes under *Bahya Kalpana*. It is a form of topical ointment preparation. *Gandhakadya Malahara* is a herbo-mineral topical formulation explained in the text *Rasatarangini*. This study deals with the pharmaceutical preparation of a *Gandhakadya Malahara* and its modification with *Ingudi taila*. **Materials and Methods:** The preparation of *Gandhakadya Malahara* was done as per the classical reference and its modification was carried by substituting *Tila taila* with *Ingudi taila* in the preparation of *Sikta taila*. General observation and organoleptic parameters are noted and recorded. **Results and Discussion:** Modified *Gandhakadya Malahara* and *Gandhakadya Malahara* were similar in physical attributes as well as organoleptic parameters. **Conclusion:** Even though both the samples of *Gandhakadya Malahara* are indistinguishable based on the organoleptic characteristics, it can be concluded that, the sample with *Ingudi taila* is more therapeutically efficient while considering the pharmacological actions of *Ingudi*.

KEYWORDS: *Gandhakadya Malahara, Ingudi* (*Balanites aegyeptiaca* Linn.), *Ingudi taila, Malahara Kalpana.*

INTRODUCTION

The word *Malahara* was adopted by *Yogaratnakara* from the word '*Malaham*' or '*Marham*' which is originated from the Unani system of medicine. In this context, it is worth full to observe that, most of Ayurvedic classics like *Charaka Samhita* and *Sushruta Samhita* got to

translated into Arabic and Persian languages around the 8th A.D. Probably, this translation would have influenced the Unani System of medical science in developing formulations like '*Marham*' from *Lepa* in *Ayurveda*. There is no reference about this dosage form available in ancient literature of *Ayurveda*. It removes *Mala* from *Vrana, Vidradi, Twak vikara* etc.[1]

The three important requirement of preparation of *Malahara* are oil base, binding base and ingredients which may vary from one *Malahara* to other. This variation depends on the number of ingredients and the season. The ratio can be altered according to the need of the situation.

Gandhakadya Malahara is explained in the textbook *Rasatarangini* 8th *Taranga Gandhaka vignaniya*. It is used for skin disease. *Gandhakadya Malahara* consists of *Gandhaka, Tankana, Girisindura, Karpura* and *Sikta taila.*[2]

Ingudi[3] (*Balanites aegyeptiaca* Linn.) *beeja taila* has been most extensively used as a healing agent for thousands of years. It acts as *Krimihara, Kushtaghna, Vranaropana, Raktashodhaka, Shoolaprashmana, Kandughna, Vishaghna* and *Dushta vrana nashaka.*[4] Hence, the study was planned by substituting *Tila taila* with *Ingudi taila*, formulation is modified and efforts were carried to make it a more potent *Malahara Kalpana* which eliminates the impurities from the site of action.

AIMS AND OBJECTIVES

- To prepare *Gandhakadya Malahara* as per classical method
- To prepare *Gandhakadya Malahara* with *Ingudi taila.*

MATERIALS AND METHODS

Materials

1. **Raw drug:** *Ingudi beeja* (*Balanites aegyptiaca* Linn), *Gandhaka* (Sulphar), *Tankana* (Borex), *Girisindura* (Redoxide of mercury), *Karpura* (*Cinnamomum camphora* L.), *Tila taila* (Sesamum oil) *and Sikta* (Beeswax) are the raw drugs used in this study.
2. **Equipment:** *Khalwa Yantra*, Porcelain jars, *Sharava*, Ladle, Weighing machine, Measuring jars, Steel vessels, Mud pot, Gas stove, Lids, Glass beaker, Knife, *Multtani Mitti*, Kora cloth, Lighter, Spatula etc.

Selection and collection of raw material

A genuine variety of *Gandhaka*, *Tankana*, *Girisindura* and *Ingudi* fruits and other drugs were procured after considering the *Grahya Lakshnas* as mentioned in classics. *Ingudi* fruits were collected from Rajkot, Gujarat.

All the materials were collected from authentic sources as mentioned in classics and all procedure is done in lab of Rasashastra and Bhaishajya Kalpana, Alva's Ayurveda Medical College, Moodubidire, Karnataka.

METHODS

- *Gandhaka Shodhana*
- *Tankana Shodhana*
- Extraction of *Ingudi taila* by compression method
- Preparation of *Sikta taila* by *Tila taila*
- Preparation of *Sikta taila* by *Ingudi taila*
- Preparation of *Gandhakadya Malahara*
- Preparation of modified *Gandhakadya Malahara*

Gandhaka Shodhana[5]

Gandhaka Shodhana was carried out by *Kurma puta* method. Where 500g *Ashuddha Gandhaka* was coarsely powdered in a *Khalwa Yantra* and 2 liter of fresh milk was taken in a *Ghritalipta* earthen vessel, the mouth of which was covered with a single layer of clean kora cloth and tied firmly with a thread. Powdered *Gandhaka* was then spread over *Ghritalipta kora* cloth and tied properly with a thread and *Sharava* was placed inversely over the pot and *Sandhibandhana* was done with *Multtannimitti*. After dying, pot was kept inside a pit and cow-dung cakes were spread over the *Sharava* and fire was lit with the help of camphor and *Mandagni* was given for 30 min. After self-cooling the pot was removed from the pit; *Sandhibandhana* was opened and *Sharava* was removed. Granules of *Shodhita Gandhaka* which were dropped down and collected in milk were secured. This *Shodhita Gandhaka* was thoroughly washed with hot water about 3 to 4 times and later dried under shade. After drying the *Shodhita Gandhaka* was a store in an airtight bottle.

Tankana Shodhana[6]

Tankana Shodhana was carried out by *Bharjana / Nirjalikarana* method. 100g *Ashodhita Tankana* was taken in a clean and dry *Khalwa Yantra* and pounded well to prepare powder.

Later, Powder of *Tankana* was taken in an iron pan and fried under *Mandagni*. Initially, it liquefies and on continuous heating; it turned into white colored *Tankana* due to the evaporation of water. *Bharjana* was continued until the water content was completely evaporated and the *Tankana* was fully bloomed and the hissing sound was disappeared. This *Shodhita Tankana* was taken in *Khalwa Yantra* and made into fine powder; later stored in an airtight container.

Extraction of *Ingudi Taila* by Compression method

Extraction of *Ingudi taila* was done by compression method. 3200g *Ingudi beeja* was fed to the oil extracting machine through the inlet. The *Ingudi beeja* was crushed and the oil was collected from one side after filtration and the waste material was collected from the other side. Oil was collected in stainless steel vessel and filtered again with kora cloth by pouring into another vessel. The final product obtained was stored in air-tight container.

Preparation of *Sikta taila* by *Tila taila*[7]

The *Sikta* and *Tila taila* was added in the ratio of 1:6 part that is *Sikta* 60g (1 Part) and *Tila taila* 360 ml (6 parts). *Tila Taila* was taken in a steel vessel; it was kept over the low flame. It was heated until the froth appeared; later *Sikta* was added and stirred continuously. Then it was subjected to heat till *Sikta* was completely melted in the *Tila taila*. Later, the burner was switched off and the mixture was filtered with a cloth into another clean steel vessel and allowed to cool. After cooling, it was stored in an airtight container.

Preparation of *Sikta taila* by *Ingudi taila*

In this Preparation, instead of *Tila taila, Ingudi taila* is used for modification. The *Sikta* and *Ingudi taila* was added in the ratio of 1:6 part that is *Sikta* 60g (1 Part) and *Ingudi taila* 360 ml (6 parts). *Ingudi Taila* was taken in a steel vessel; it was kept over the low flame. It was heated until the froth appeared; later *Sikta* was added and stirred continuously. Then it was subjected to heat till *Sikta* was completely melted in the *Ingudi taila*. Later, the burner was switched off and the mixture was filtered with a cloth into another clean steel vessel and allowed to cool. After cooling, it was stored in an airtight container.

Preparation of *Gandhakadya Malahara*[8]

Ingredients: *Sikta taila* – 360ml

Shuddha Gandhaka – 30g

Girisindura – 30g

Shuddha Tankana – 7.5g
Karpura – 7.5g

Shuddha Gandhaka, *Girisindura*, *Shuddha Tankana* and *Karpura* were taken in *Khalwa yantra* and made into fine powder separately. *Sikta taila* was taken in a vessel and heated on mild fire. When it liquefied, the vessel was taken out of fire and added with the fine powders of *Gandhaka*, *Girisindura*, *Tankana* and *Karpura* one by one and stirred until a homogenous mixture was attained. The obtained final product was stored in an airtight container.

Preparation of modified *Gandhakadya Malahara*

Ingredients: *Sikta taila* prepare by *Ingudi taila* – 360ml
Shuddha Gandhaka – 30g
Girisindura – 30g
Shuddha Tankana – 7.5g
Karpura – 7.5g

Shuddha Gandhaka, *Girisindura*, *Shuddha Tankana* and *Karpura* were taken in *Khalwa yantra* and made into fine powder separately. Prepared *Sikta taila* with *Ingudi taila* was taken in a vessel and heated on mild fire. When it liquefied, the vessel was taken out of fire and added with fine powder of *Gandhaka*, *Girisindura*, *Tankana* and *Karpura* one by one and stirred until a homogenous mixture was attained. The obtained final product was stored in an airtight container.

OBSERVATION AND RESULTS

Observation of *Gandhaka Shodhana*

- When the *Sharava* was removed after self-cooling, all the mud particles and other physical impurities present in *Gandhaka* were seen on the cloth.
- After washing with hot water, the colour of *Gandhaka* was bright yellowish colour and had pleasant smell.
- *Shodhita Gandhaka* was in granular form and few were streak like; some are fully immersed in the milk and few granules were seen floating on the milk.

Table 1: Showing observation of *Gandhaka* before and after *Shodhana.*

Parameter	Before *Shodhana*	After *Shodhana*
Smell of milk	No smell of Sulphur	Smell of Sulphur
Colour of milk	White	Yellow
Colour of *Gandhaka*	Yellow	Bright Yellow
Appearance of *Gandhaka*	Crystal	Granules
Smell of *Gandhaka*	Sulfurous	A typical pleasant smell of Sulphur

Observation of *Tankana Shodhana*

- Initially, it liquifies and on continuous heating; it turns into white coloured *Tankana* due to the evaporation of water.
- Initially it liquefies while frying and then it produces hissing sound.
- After frying, *Ashodhita Tankana* becomes bloomed and turned into a white opaque substance.
- The weight of *Tankana* reduced after frying due to evaporation of water content.
- The total time taken for *Shodhana* is 30 min.

Observation of *Sikta taila* and its modification with *Ingudi taila*

- Froth had appeared after 5 min of heating of *Tila taila* and *Ingudi taila* on *Mandagni*.
- *Sikta* took 10 min to dissolve fully in the *Tila taila* or *Ingudi taila*.

Table 2: Showing organoleptic character of *Sikta taila* and its modification with *Ingudi taila.*

Parameter	Observation on prepared *Sikta taila* by *Tila taila*	Observation on prepared *Sikta taila* by *Ingudi taila*
Colour	Whitish	Yellowish
Consistency	Semisolid	Semisolid
Texture	Soft, Smooth	Soft, Smooth
Touch	Oily	Oily
Smell	Smell of *Tila taila*	Characteristic smell

Observation of *Gandhakadya Malahara* and its modification with *Ingudi taila*

- It took 10 min for liquefaction of *Sikta taila*.
- When adding *Gandhaka Churna*; the colour of the mixture turned to pale yellow.
- While adding *Girishingura*; the colour of the mixture turned to orange.
- After adding fine powders of *Gandhaka, Girisindura, Tankana* and *Karpura*; the mixture become semisolid and it took time for proper mixing.
- After proper stirring orange colour homogenous mixture was obtained as final product.

- Total time taken for preparation was 1hour and 10 min.

Table 3: Showing organoleptic character of *Gandhakadya Malahara* and its modification with *Ingudi taila.*

Parameter	**Observation of *Gandhakadya Malahara***	**Observation of modified *Gandhakadya Malahara***
Colour	Orange	Orange
Consistency	Semisolid like ointment	Semisolid like ointment
Texture	Smooth, unctuous	Smooth, Unctuous
Touch	Oily and sticky	Oily and sticky
Smell	Characteristic, predominantly smell of *Karpura*	Characteristic, predominantly smell of *Karpura*

RESULT: Results of all pharmaceutical procedure is given in Table 4.

Table 4: Result of pharmaceutical study.

	Quantity Taken	**Final Yield**	**Loss / Gain**	**Yeild (in %)**
Gandhaka Shodhana	500g	463g	37g	92.6 %
Tankana Shodhana	100g	59g	41g	59%
Ingudi taila	3200g	1350 ml	1850 ml	42.18%
Sikta tala* by *Tila taila	420 ml	402 ml	18 ml	95.71%
Sikta taila* by *Ingudi taila	420 ml	397 ml	23 ml	94.52%
Gandhakadya Malahara	360 ml oil	376g	16g (Gain)	-
Modified *Gandhakadya Malahara*	360 ml oil	379g	19 g (Gain)	-

DISCUSSION

Malahara Kalpana[9] comes under *Bahya Kalpana*. It is a form of ointment preparation which has *Sikta taila* or *Ghrita*, as the basic constituent. The other ingredients may include herbal, metal and mineral contents depending upon the usage. *Gandhakadya Malahara* is explained in the textbook *Rasatarangini* 8th *Taranga Gandhaka vignaniya*. It is used as an external application for skin disease. *Gandhakadya Malahara* consists of *Gandhaka, Tankana, Girisindura, Karpura* and *Sikta taila*.

Gandhaka Shodhana

- *Gandhaka Shodhana* was carried out by *Kurma puta* method according to reference from *Rasendra Sara Sangraha.*
- The criteria behind selecting this process are the negligible loss during this process. It's a convenient method and can be completed in a short duration.

- *Godugdha* was selected as *Shodhana Dravya* as it is antidote for *Gandhaka* and *Godugdha* is the commonly recommended antidote for poisoning, it might be helpfull in neutralizing the sulphur poisoning and *Guru Snigdha Guna* and *Sheeta Veerya* of *Godugdha* pacifies the *Tikshna, Ushna Guna* of *Gandhaka*. Otherwise it causes *Bhrama, Tapa, Kushta* and *Pitta Roga*.
- After *Shodhana*, *Gandhaka* became bright yellow in colour, pleasant smell and very soft, may be due to absence of physical impurities like stone, sand etc from *Gandhaka*.
- 463 g of *Shodhita Gandhaka* was obtained and total loss of *Gandhaka* after *Shodhana* was 37g; loss may be due to impurity in *Gandhaka*.

Tankana Shodhana

- *Tankana Shodhana* was performed by the process of *Bharjana / Nirlajjikarana* according to reference of *Rasatarangini*.
- 100 g *Ashodhita Tankana* was taken in a earthen plate and subjected to heat until the water content was completely evaporated (*Nirjalikarana*) and *Tankana* bloomed completely and disappearances of hissing sounds.
- Initially, it liquefies and stuck to the vessels and on continuous heating it turned into white coloured *Tankana*.
- After frying, *Ashodhita Tankana* becomes bloomed and turned into a white opaque substance because of evaporation of water contents.
- The weight of *Tankana* reduced after frying due to evaporation of water content.
- The total time was taken for procedure is 30 min and 59 g *Shodhita Tankana* was obtained and 41 g loss of *Tankana* was there due to impurity of *Tankana*.

Extraction of *Ingudi taila* by compression method

- *Ingudi* (*Balanites aegyeptiaca* Linn.) *beeja taila* has been most extensively used as a healing agent for thousands of years. *Ingudi taila* has *Laghu* and *Snigdha Guna, Tikta* and *Katu rasa, Katu vipaka, Ushna virya*. It acts as *Krimihara, Kushtaghna, Vranaropana, Raktashodhaka, Shoolaprashmana, Kandughna, Vishaghna* and *Dushtavrana nashaka.*
- 3200 g *Ingudi beeja* was fed to the oil extracting machine through the inlet. The oil was collected from one side after filtration and waste material was collected from the other side. *Ingudi taila* found to be yellow colour, characteristic smell, smooth and unctuous consistency, smooth and oily texture.

- The total quantity of *Ingudi taila* finally obtained was 1350 ml and total time was taken is 35 min. and yield of *Ingudi taila* was 42.18%.

Preparation of *Sikta taila* and its modification with *Ingudi taila*

- According to *Rasatarangini* reference *Sikta taila* is prepare by 1 part *Sikta* and 6 part *Tila taila*. Here, 360 ml of *Tila taila* and 60 g of *Sikta* was taken as per ratio 1:6 of *Sikta* and *Tila taila* ensure proper consistency of *Sikta taila.*
- *Tila taila* was heated over *Mandagni* and later. *Sikta* was added and stirred well until the *Sikta* was completely melted and mixed with *Tila taila*.
- Final product obtained was white in colour, semisolid consistency, soft and smooth in texture and oily in nature.
- The quantity of final product of *Sikta taila* was obtained was 402 ml and yield of *Sikta taila* was 95.71%.
- In preparation of modified *Sikta taila* with *Ingudi taila*, 360 ml of *Ingudi taila* was taken instant of *Tila taila* and 60 g of *Sikta* was taken as per 1:6 ratio of drug and homogeneous mixture of *Sikta taila* was obtained. This was yellow in colour, semisolid consistency, soft and smooth in texture.
- The quantity of final product of modified *Sikta taila* with *Ingudi taila* was 397 ml and yield 94.52%

Preparation of *Gandhakadya Malahara* and its modification with *Ingudi taila*

- *Gandhakadya Malahara* was prepared according to reference *Rasatarangini* textbook.
- *Sikta taila* was heated and melted; powders of *Gandhaka, Girisindura, Tankana, Karpura* were added one by one and stirred well until a homogenous mixture was attained. When adding *Gandhaka churna,* the colour of the mixture turned to pale yellow colour and while adding *Girisindura*, the colour of mixture turned into orange colour.
- The obtained final quantity of *Gandhakadya Malahara* was 376 g and 16 g gain in weight of final product was due to addition powders of *Gandhaka, Tankana, Girisindura, Karpura.*
- In modification of *Gandhakadya Malahara*; *Ingudi taila* was used in preparation of *Sikta taila*. Here, substituting *Tila taila* with *Ingudi taila* to make a more potent *Malahara Kalpana* which eliminates the impurity from the site of action.
- Modified *Gandhakadya Malahara* was orange coloured, semisolid ointment like in consistency, smooth and unctuous texture, oily and sticky at touch, characteristic smell

and predominantly smells of *Karpura*. The obtained final quantity of modified *Gandhakadya Malahara* was 379g.

CONCLUSION

Gandhakadya Malahara was explained in the text *Rasatarangini* 8th *Taranga* in treatment of skin disorder. *Ingudi taila* is a potent drug in the management of *Vrana* as local application. In this study, *Ingudi taila* was taken in the place of *Tila taila* while preparing the base *Sikta taila*. Here, *Gandhakadya Malahara* and its modification with *Ingudi taila* was prepared as per standard pharmaceutical procedure. Based on organoleptic characteristics and physical findings we can deduce that the sample with *Ingudi taila* is stable and mass acceptable.

PHOTOGRAPHS

GANDHAKA SHODHANA

Fig. 1: *Ashuddha Gandhaka*

Fig. 2: Ingredients

Fig. 3: Adding milk in pot

Fig.4: Spreading Ashuddha *Gandhaka Churna* over cloth

Fig.5: *Sandhibandhana*of Pot

Fig.6 : Giving *Puta*

Fig. 7: Granular form of *Gandhaka*

Fig. 8: Washing *Gandhaka churna* in hot water

Fig. 9: *Shodhita Gandhaka*

TANKANA SHODHANA

Fig.10. Powder of *Tankana*

Fig.11: *Ashuddha Tankana* taken in pan

Fig.12: On frying *Tankana* loses water

Fig. 13: *Shodhita Tankana*

EXTRACTION OF *INGUDI TAILA* BY COMPRESSION

Fig. 14: *Ingudi beeja*

Fig.15: Oil Compression Machine

Fig. 16: *Ingudi taila*

PREPARATION OF *SIKTA TAILA* BY *TILA TAILA*

Fig.17: Ingredients of *Sikta taila*

Fig. 18: Melting of *Sikta*

Fig.19: Filtering with Kora cloth

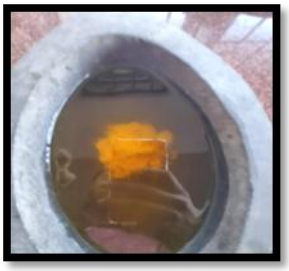

Fig. 20 : Final product as *Sikta taila*

PREPARATION OF *SIKTA TAILA* BY *INGUDI TAILA*

Fig. 21: Ingredients of modified *Sikta taila*

Fig. 22: Melting *Sikta* in to *Ingudi taila*

Fig. 23: Filtering with kora cloth

Fig. 24: Final product of modified *Sikta taila*

PREPARETION OF *GANDHAKADYA MALAHARA*

Fig. 25 : Ingredients of *Gandhakadya Malahara*

Fig. 26: Adding Ingredients and triturating

Fig. 27: Packing of Final Product

PREPARETION OF MODIFIED *GANDHAKADYA MALAHARA*

Fig. 28: Ingredients of modified *Gandhakadya Malahara*

Fig. 29: Adding ingredients in *Sikta taila*

Fig. 30: Triturating

Fig. 31: Packing of Final product

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