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RESEARCH ARTICLE

PHARMASUTICAL STUDY OF MANASHILA W.S.R. TO ITS VARIOUS SHODHANA PROCEDURES

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ABSTRACT

Ayurveda, the science of life is being practiced by *Aryans* from *Vedic* period. *Kalpana* is the process through which a substance can be transformed in to the form of medicine according to the need. *Samskaras* are to be done for potentiating the drug or the formulation. Among all these pharmaceutical processes *Shodhana* is one of them. For a single drug many process of *Shodhana* have been mentioned. Arsenic compounds are being popularly used in *Ayurveda* therapeutics since centuries. *Manashila* being important among them. *Manashila* is an important *Rasayana Dravya* and commonly used in treating the diseases like *Shwasa-Kasa, Agnimandya, Kshaya, Anaha, Jwara, Krimi, Visharoga*, *Raktavikara* etc. (Sri Vagbhatacharya *et al*., 1999) *Manashila* is called as red arsenic with two molecules of Arsenic and two molecules of Sulphur (AS_2S_2). *Manashila* consumed without proper *Shodhana* causes *Mandagni, Malabaddata, Ashmari* and *Mutra Krichra*[4]. Hence *Shodhana* of *Manashila* is essential after which it cures all the diseases (Ayurvedic Formulary of India, 2003). *Shodhana* is the process of removal of physical, chemical impurities and potentiating of the drugs (Sri Sadananda Sharma *et al*., 1989; Sri Vagbhatacharya *et al*., 1999). *Shuddha Manashila* is an important ingredient in most of the popular formulations like *Shwasakuthara Rasa, Rasa Raja Rasa, Trailokyachintamani Rasa* etc. There are various *Shodhana* procedures explained for *Manashila* in *Rasa* classics like *Rasa Ratna Samucchaya*[7], *Ayurveda Prakasha* (Sri Sadananda Sharma *et al*., 1989) and *Rasa Tarangini* (Ayurvedic Formulary of India, 2003). Some works on *Manashila* has been carried out like its clinical aspect on *Dhooma*, *Rasayana* and *Lepa*. In these various studies only one *Shodhana* procedure by *Ardraka Swarasa* is done (The Ayurvedic Pharmacopoeia of India (Ministry of health & family welfare Gov. of India) 1999). There are three types of *Manashila* like *Shyamangi, Kanaveeraka* and *Khandakya* ((The Ayurvedic Pharmacopoeia of India (Ministry of health & family welfare Gov. of India) 1999)), which are superior in increasing order. So *Khandakya* is superior most and which also yields more *Satva* (The Ayurvedic Pharmacopoeia of India (Ministry of health & family welfare Gov. of India) 1999). For the present study *Khandakya* type of *Manashila* is selected. Various textual references of *Manashila*, will be collected from various classics and will be discussed. *Manashila* sample that has been selected for the present study will be qualitatively certified as per classical and modern analytical parameters. Various methods of *Shodhana* for *Manashila* explained in classics are collected and discussed. The present study includes *Shodhana* of *Khandakhya Manashila* as per Classical reference of *Rasa Tarangini* where *Shodana* of *Khandakhya Manashiala* is done by *Churnodaka, Bhrungaraja Swarasa and Nimbuka Swarasa.* Standard Operative Procedure of the process is done in the pharmaceutical study. The analytical study reveals the standards which can be given for *Ashuddha Manashila* and *Shuddha Manashila* of various Samples. The differences in the parameters reveal that there are some changes which give us the idea regarding role of a particular media in purification of a substance, where it adds some properties of the media used.

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INTRODUCTION

In the global scenario there is a lot of discussion regarding the toxicity of arsenic compounds. Arsenic compounds are being popularly used in *Ayurvedic* therapeutics since centuries. *Manashila* and *Haratala* being important among them (Sri Vagbhatacharya *et al*., 1999). *Manashila* is an important *Rasayana Dravya* and commonly used in treating the diseases like *Shwasa-Kasa, Agnimandya, Kshaya, Anaha, Jwara, Krimi, Visharoga*, *Raktavikara* etc. (Sri Vagbhatacharya *et al*., 1999) *Manashila* is called as red arsenic with two molecules of Arsenic and two molecules of Sulphur (AS_2S_2). *Manashila* consumed without proper *Shodhana* causes *Mandagni, Malabaddata, Ashmari* and *Mutra Krichra* (Ayurvedic Formulary of India, 2003). Hence *Shodhana* of *Manashila* is essential after which it cures all the diseases (Ayurvedic Formulary of India, 2003). *Shodhana* is the process of removal of physical, chemical impurities and potentiating of the drugs (Sri Sadananda Sharma *et al*., 1989; Sri Vagbhatacharya *et al*., 1999). *Shuddha Manashila* is an important ingredient in most of the popular formulations like *Shwasakuthara Rasa, Rasa Raja Rasa, Trailokyachintamani Rasa* etc. There are various *Shodhana* procedures explained for *Manashila* in *Rasa* classics like *Rasa Ratna Samucchaya* (Sri Madhava *et al*., 1999), *Ayurveda Prakasha* (Sri Sadananda Sharma *et al*., 1989) and

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Rasa Tarangini (Ayurvedic Formulary of India, 2003). Some works on *Manashila* has been carried out like its clinical aspect on *Dhooma*, *Rasayana* and *Lepa*. In these various studies only one *Shodhana* procedure by *Ardraka Swarasa* is done (The Ayurvedic Pharmacopoeia of India (Ministry of health & family welfare Gov. of India) 1999) There are three types of *Manashila* like *Shyamangi, Kanaveeraka* and *Khandakya* done (The Ayurvedic Pharmacopoeia of India (Ministry of health & family welfare Gov. of India) 1999), which are superior in increasing order. So *Khandakya* is superior most and which also yields more *Satva* done (The Ayurvedic Pharmacopoeia of India (Ministry of health & family welfare Gov. of India) 1999). For the present study *Khandakya* type of *Manashila* is selected. Various textual references of *Manashila*, will be collected from various classics and will be discussed. *Manashila* sample that has been selected for the present study will be qualitatively certified as per classical and modern analytical parameters. Various methods of *Shodhana* for *Manashila* explained in classics are collected and discussed. Till today no work has been carried out on various *Shodhana* procedures of *Manashila*, intention behind these and complete structural validation of the same is yet to be established. For the present study the various *Shodhana* procedures mentioned in *Rasa Tarangini* (Ayurvedic Formulary of India 2003) are followed.

All the constituents used for *Shodhana* will be collected from local market area and our college Herbal garden. Good manufacturing practice will be followed for preparing the various medias and *Shodhana* of *Manashila* as per classical reference (Ayurvedic Formulary of India 2003) mentioned below.

Sample	Raw Drug	Media	Process/Apparatus	Duration
1	*Manashila*	*Churnodaka*	*Nimmajana/Mrut Patra*	3 days
2	*Manashila*	*Bhrungaraja Swarasa*	*Swedana/Dola Yantra*	12 hours
3	*Manashila*	*Nimbu Swarasa*	*Bhavana/Khalwa Yantra*	7 times

Here scientific evaluation of various *Shodhana* procedures and Standard Operating Procedure (S.O.P) will be done by considering suitable physico- chemical parameters and possible instrumental methods which may add considerable input to the existing knowledge.

Aims and objectives

1. Authentification of *Khandakya Manashila*.
2. Physico - chemical analysis of *Manashila*, before and after *Shodhana* procedures.
3. An attempt will be made to establish S. O. P for *Shodhana* procedures of *Manashila* by *Churnodaka, Bhrungaraja Swarasa* and *Nimbuka Swarasa*.

Pharmaceutical syudy

Introduction

Standards are living documents, which reflect science, technology and systems. To maintain their value, they should be first decided, achieved, set and then periodically validated to maintain their reproducibility. *Ayurveda* is the science of life, which protects and perpetuates the human life in a healthier way. For fulfillment of this purpose "Tetrod" i.e. *Vaidya, Aushadha, Rogi* and *Paricharaka* have been described by our great sages, *Aushadha* (drug) being the primary tool of *Vaidya* for combating various ailments. These *Aushadha* are prepared by different processing techniques applying to the raw drugs to get the desired effect. This processing results in transformation of good pharmacological action to that of substance. These pharmaceutical processes are called "*Samskaras*". Medicaments of any system play a great role in establishment as well as in propagation of the particular system. So enough amount of attention has been provided in allopathic system of medicine is regards of quality production of medicaments. Result is well known that this very modern system of medicine has originated in Europe but at present it is accepted across the globe. But unfortunately in spite of the fact that our system of medicine is much more older in origin as well as in practice in comparison to present other systems of medicine, still we are not fully accepted even in this subcontinent. Many reasons are behind it. One of them is our incapability to produce quality drugs. After considering the vital importance of this fact concern *Ayurveda* is now orienting its resources for the advancement of this ignored pharmaceutical science. Behind all the pharmaceutical procedures, *Shodhana* has its prime importance, because it is the *Shodhana* by which we can use all the substances as medicine from herbal to mineral in origin, even though they are having many toxic effects on human body. Shodhana is the process of removal of physical, chemical impurities and potentiating of the drugs (Sri Vagbhatacharya *et al*., 1999; Ayurvedic Formulary of India, 2003) By the process of *Shodhana*, the virtues of properties of *Shodhana Dravyas* are inherited into a substance. Standardization of *Ayurvedic* formulations and their manufacturing processes are the need of present hour. So one can check adulteration, identify the spurious material, improve the quality of drugs and maintain the uniformity of the products in different batches. In this way only *Ayurvedic* drugs can be made acceptable worldwide. There are various pharmaceutical processes which have been described for *Shodhana* such as *Swedana, Nirvapa, Avapa, Bharjana, Galana, Shoshana, Patana*, *Bhavana* etc. These are not merely the chemical purification but in a nutshell it can be said that to make substances bio-assimilable, they are subjected to *Shodhana*, the specific process of the addition and separation according to the need of our body. So it has become our prime duty to establish the proper *Shodhana* method in the scientific way in regards to get specific therapeutic effect and get maximum yield as well fulfilling all necessary parameters to make that substance best therapeutic.

ÎZÉ³ÉÇ MÔüwqÉÉhQûiÉÉårÉå uÉÉ ÌiÉsÉ¤ÉÉUeÉsÉå ÅÌmÉuÉÉ |
iÉÉårÉå uÉÉ cÉÔhÉïxÉÇrÉÑ£åü SÉåsÉÉrÉl§ÉåhÉ zÉÑ®rÉÌiÉ ||

Rasa Ratna Samucchaya 3/70

In the context of present study *Manashila* (*Khandakya*) *Shodhana* have been performed by *Churnodaka, Bhrungaraja Swarasa and Nimbuka Swarasa* as mentioned in *Rasa Tarangini* (Ayurvedic Formulary of India, 2003). Practical study was carried out under the supervision of our Guide in Dept. of Rasashastra & Bhaishajya Kalpana, N.K.J.A.M.C. & P.G. Centre, Gumpa, Bidar.

Practical study is comprised of

Preparation of *Churnodaka*, Practical 1.

Manashila Shodhana by *Churnodaka* Practical 2.
Preparation of *Bhrungaraja Swarasa,* Practical 3.
Manashila Shodhana by *Bhrungaraja Swarasa,* Practical 4.
Preparation of *Nimbuka Swarasa*, Practical 5.
Manashila Shodhana by *Nimbuka Swarasa*, Practical 6.

Name of the practical: Preparation of *Churnodaka*[48]

Practical 1.

Ref.: Rasa Tarangini 11/216-218
UÌ£ü²rÉÉåÎlqÉiÉÇ cÉÔhÉïÇ mÉgcÉiÉÉåsÉMüxÉÇÍqÉiÉå |
eÉsÉå ÌuÉÌlÉÍ¤ÉmÉåimÉëÉ¥ÉÎx§ÉrÉÉqÉÇ xjÉÉmÉrÉåSè oÉÑkÉÈ ||
iÉiÉÈ xÉÉUMümÉ§ÉåhÉ xÉÉUrÉåiMüÉcÉmÉÉ§ÉMåü |
cÉÔhÉÉåïSMüÍqÉÌiÉ ZrÉÉiÉÇ iÉjÉæuÉÇ cÉ xÉÑkÉÉåSMüqÉç ||
cÉÔhÉÉåïSMÇü SØRûWûËUiMüÉcÉMÑümrÉÇ ÌlÉkÉÉmÉrÉåiÉç |
iÉjÉÉÌiÉxÉÇrÉiÉålÉåWû ÌmÉkÉÉlÉålÉ ÌlÉUÉåkÉrÉåiÉç ||

Date of Starting :1st Day
Date of Completion:2nd Day

Material Required: Stainless steel vessels, Weighing Balance, Clean cotton cloth, measuring jar, Spoons.

Ingredients : *Churnodaka* was prepared in the ratio of *Churna* : Water i.e. 1:240

1) Churna-4 gm
2) Water (Portable) -960 ml

Procedure

- *Churna of* about 4 gm was taken in a clean stainless vessel and water of about 960 ml was added and stirred well.
- It was kept stand still for 9 hours.
- The supernant fluid was collected and filtered with a clean cloth and kept preserved in green glass bottle.

Observations

- When *Churna* got dissolved in water it turned milky
- After 9 hours of stand still, the *Churna* settled down and the supernant fluid was transparent light milky in color.

Precautions

- It was kept stand still for 9 hrs
- Utensils, vessels and filtering cloth should be clean.
- Filtering should be done properly

Results

- Final quantity of *Churnodaka* obtained is: 900 ml.
- Colour : Transparent light milky.
- Taste: Sour Astringent (Figure-7)

Name of Practical : *Manashila Shodhana* by *Churnodaka*
Practical 2

Ref. : Rasa Tarangini 11/109
Date of Starting :1st Day
Date of Completion :3rd Day

Material Required: Stainless Steel Vessel, Weighing Balance, *Khalwa Yantra,* Measuring Jar, Clean Strong Cotton Cloth etc.

Ingredients

1. *Ashuddha Manashila*:200 gm
2. *Churnodaka*:900 ml

Sanskara Adopted: *Nimajjana Sanskara*

Procedure

- Physical impurities like stone, sand etc. were manually cleaned.
- *Ashuddha Manashila* was taken in a clean *Khalwa Yantra* and made in to small pieces.
- The pieces were spread on a clean strong cotton cloth and *Pottali* was prepared.
- This *Pottali* was tied and kept in clean stainless steel vessel.
- Then *Churnodaka* was added in such a quantity that the *Pottali* got completely immersed.
- It was kept for whole night, next day again the *Pottali* was removed and immersed in new vessel and fresh *Churnodaka* was added.
- It was repeated for 3 days
- After that the *Pottali* was washed with warm water and the *Manashila* pieces were collected carefully.
- *Manashila* pieces were washed with warm water and dried for 6-8 hours.
- After complete drying the *Shuddha Manashila* was collected.

Observations

- The color of *Ashuddha Manashila* was reddish, brownish black tinge with little shining crystalline smooth texture and having peculiar odor.
- The color of *Churnodaka* changed to slight reddish color
- Reddish brown with little shining crystalline smooth texture small pieces of *Shuddha Manashila* were collected after proper drying

Results

•*Ashuddha Manashila*	• 200gm
•*Churnodaka*	• 2700 ml
•*Shuddha Manashila* obtained	• 195 gm
Total duration for *Shodhana* process	4 day (Approx.)

Precautions

- Utensils and vessels should be clean and disinfected.
- *Ashuddha Khandakya Manashila* should be made in to small pieces before subjecting to the process.
- *Pottali* should be prepared from a strong cotton cloth.
- *Pottali* should completely get dipped in *Churnodaka*.
- Fresh *Churnodaka* was taken daily for *Nimajjana*.

- After proper *Shodhana* the pieces were carefully washed with warm water and collected carefully and dried. (Figure-8)

Name of the practical: Preparation of *Bhrungaraja Swarasa*

Practical 3.

Ref.: General method of *Swarasa* preparation
Date of Starting :1st Day
Date of Completion:1st Day

Material Required: Stainless steel vessels, Knife, Mixer Grinder, Weighing Balance, Clean cotton cloth, Measuring jar, Spoons.

Ingredients :

Bhrungaraja -10 kg

Procedure

- *Bhrungaraja* was washed in water and cleaned externally.
- With a clean knife it was chopped in to small pieces
- Then put in mixer grinder and *Kalka* was prepared.
- Then *Kalka* was squeezed with a clean cloth and juice was extracted.
- It was filtered with clean cotton cloth and filtered liquid was collected as *Bhrungaraja Swarasa.*

Observations

- *Bhrungaraja* was cut in to small pieces of 1 inch size.
- During the grinding little frothing was observed.
- As it was very hard to remove the *Swarasa*, 250 ml of water was added during grinding
- It took approximately 1.30 hours to extract the juice
- The color of extracted juice was dark greenish.

Precautions

- Utensils, vessels and filtering cloth should be clean.
- Squeezing should be done properly to extract maximum juice.

Result

- Final quantity of *Bhrungaraja Swarasa* obtained is: 1.8 ltr.
- Colour : Dark green color.
- Taste: *Katu, Tikta Rasa* (Figure-9)

Name of Practical : *Manashila Shodhana* by *Bhrungaraja Swarasa*

Practical 4.

Ref. : Rasa Tarangini 11/110
Date of Starting :1st Day
Date of Completion :2nd Day

Material Required: Stainless Steel Vessel, Gas Stove, Spatula, Weighing Balance, Measuring Jar, Clean Strong Cotton Cloth, and Mercury Thermometer etc.

Ingredients :

1. *Ashuddha Manashila*:200 gm
2. *Bhrungaraja Swarasa*:1.8 ltr.

Sanskara Adopted: Swedana Sanskara

Procedure :

- Physical impurities like stone, sand etc. were manually cleaned.
- *Ashuddha Manashila* was taken in a clean *Khalwa Yantra* and made in to small pieces.
- The pieces were spread on a clean strong cotton cloth and *Pottali* was prepared.
- This *Pottali* was tied to a clean iron rod and the *Pottali* was suspended in a clean stainless steel vessel.
- Then the *Swarasa* was added in such a quantity that the *Pottali* got completely immersed. It was kept on gas stove and fire was ignited (Gas knob was set on sim). This arrangement resembles the *Dola Yantra.*
- The apparatus was heated for 12 hours (Four *Yama*). After that the *Pottali* was washed with warm water and the *Manashila* pieces were collected carefully.
- *Manashila* pieces were washed with warm water and dried for 6-8 hours.
- After complete drying the *Shuddha Manashila* was collected.

Observations :

- The color of *Ashuddha Manashila* was reddish, brownish black tinge with little shining crystalline smooth texture and having peculiar odor.
- During boiling the color of the *Swarasa* changed to dark color
- During heating little peculiar odor of *Bhrungaraja* was felt.
- As the process continued little quantity of *Swarasa* was added as the *Swarasa* evaporated.
- Bright reddish shining crystalline smooth texture small pieces of *Shuddha Manashila* were collected after proper drying.

Temperature and Duration

Day	Heating Device	Duration	Temp. ^{0}C
1st	Gas Stove	12 hours	$62^0 – 95^0$C
1st	Sun Shade	6-8 hours	36^0 -- 38^0C

Results

•*Ashuddha Manashila*	:	•:	200gm
•*Bhrugaraja Swarasa*	:	•:	1.8 ltr.
•*Shuddha Manashila* obtained :		•:	192gm
Total duration for *Shodhana* process		:	2 day (Approx.)

Precautions

- Utensils and vessels should be clean and disinfected.
- *Ashuddha Manashila* should be made in to small pieces before subjecting to the process.
- *Pottali* should be prepared from a strong cotton cloth.

- *Pottali* should completely get dipped in *Swarasa* and it should not touch the bottom of the vessel.
- Heating should be controlled and temperature should be maintained about 62-95^{0}C inside the vessel.
- Temperature should be checked time to time with the help of mercuric thermometer.
- Continuous adding of *Swarasa* should be done as it gets evaporated.
- After proper *Shodhana* the pieces were carefully washed with warm water and collected carefully and dried. (Figure-10)

Name of the practical: Preparation of *Nimbuka Swarasa*
Practical 5

Ref.: General method of *Swarasa* preparation
Date of Starting :1st Day
Date of Completion:1st Day

Material Required: Stainless steel vessels, Knife, Clean cotton cloth, Measuring jar, Lemon Squeezer.

Ingredients :

1) *Nimbuka Phala* (Lemon) -10 Numbers (Medium size)

Procedure :

- *Nimbuka Phala* was washed in water and cleaned externally.
- With a clean knife it was cut in the middle in to two equal pieces
- Then put in lemon squeezer and *Swarasa* was squeezed.
- It was filtered with a clean filter and filtered liquid was collected as *Nimbuka Swarasa*.

Observations :

- *Nimbuka* was cut in to two pieces.
- *Swarasa* of about 50 ml was obtained from 10 *Nimbukas*
- It took approximately 30 min to squeeze the juice
- The color of extracted juice was light peach.

Precautions

- Utensils, vessels and filtering should be clean.
- Squeezing should be done properly to extract maximum juice.

Result

- Final quantity of *Nimbuka Swarasa* obtained is: 50ml.
- Colour : Translucent dirty white color.
- Taste: *Amla Rasa* (Figure-11)

Name of Practical : *Manashila Shodhana* by *Nimbuka Swarasa*

Practical 6.

Ref. : Rasa Tarangini 11/111
Date of Starting :1st Day
Date of Completion :7th Day

Material Required: Stainless Steel Vessel, Weighing Balance, Measuring Jar, Clean Strong Cotton Cloth, *Khalwa Yantra* (Porcelain) etc.

Ingredients :

1. *Ashuddha Manashila* :200gm
2. *Nimbuka Swarasa*:Q.S.

Sanskara Adopted: *Bhavana Sanskara*[49]

rÉccÉÔÍhÉïïÉxrÉ kÉÉiuÉÉSæSìïuÉæÈ xÉqmÉåwrÉ vÉÉåwÉhÉqÉç |
pÉÉuÉlÉqÉç iÉlqÉiÉqÉç ÌuÉelÉæÈ pÉÉuÉlÉÉ cÉ ÌlÉaÉSèkrÉiÉå |
Rasa Tarangini 2/49

Procedure

- Physical impurities like stone, sand etc. were manually cleaned.
- *Ashuddha Manashila* was taken in a clean *Khalwa Yantra* and made in to small pieces.
- Then lemon juice of Q.S. was added until the *Churna* gets completely dipped in *Swarasa*.
- Slowly *Bhavana* (trituration and lavigation) for at least 6 hours a day.
- Then after drying of *Swarasa* the next day again fresh *Swarasa* is added and *Bhavana* was given.
- *Bhavana* is repeated for 7 days.
- After last *Bhavana* it is kept for complete drying
- After complete drying the *Shuddha Manashila* was collected.

Observations :

- The color of *Ashuddha Manashila* was reddish brownish black tinge with little shining crystalline smooth texture and having peculiar odor.
- Remarkable constant increase in weight was noted.
- Odor of *Bhavana Dravya* along with the smell of *Manashila*.
- Shiny particles completely disappeared.
- Yellowish orange small flakes of *Shuddha Manashila* were collected after proper drying.

Results :

•*Ashuddha Manashila*	:	•:	200 gm
•*Nimbuka Swarasa*	:	•:	Q.S.
•*Shuddha Manashila* obtained	:	•:	205 gm
Total duration for *Shodhana* process		:	8 days (Approx.)

Precautions:

- Utensils and vessels should be clean and disinfected.
- *Ashuddha Manashila* should be made in to small pieces before subjecting to the process.
- Trituration was done carefully
- After proper *Shodhana* it was dried carefully and collected. (Figure-12)

Figure 1. Ashudda Manashila (Khandakya)

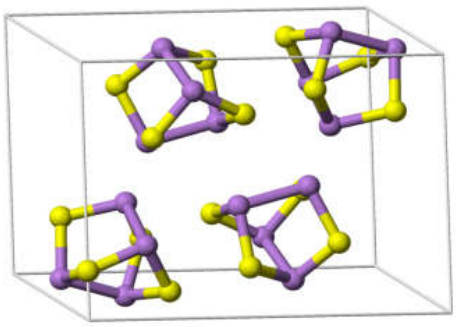

Figure 2. Atomic Structure of Arsenic Disulphide

Figure 1. Churna

Figure 4. Nimbuka Plant

Figure 5. Nimbuka

Figure 6. Churnodaka

Figure 7. Churnodaka

Figure 8. Shuddha Manashila (By Churnodaka)

Figure 9. Bhrungaraja Swarasa

Figure 10. Shuddha Manashila Bhringaraja Swarasa

Figure 11. Nimuka Swarasa

Figure 12. Shuddha Manashila By Nimbuka Swarasa

DISCUSSION

The present research work was planned with an aim to establish Standard Operating Procedure (S.O.P) for *Shodhana* procedures of *Ashuddha Khandakhya Manashila* by *Churnodaka, Bhringaraja Swarasa and Nimbuka Swarasa*. To find out the effect of different S*hodhana* medias on the physico-chemical properties of *Manashila*. Went through the whole literature on *Manashila* available from *Vedic* period to the advancement of present time. To achieve the goal of present study, the work has been divided in three major parts – Conceptual study which includes Drug review and Concept of *Shodhana,* Pharmaceutical study, Analytical study. Analysis and results of each study are discussed in this section. Analytical study of *Ayurvedic* drugs has become the need of present hour. In ancient days, the drugs were prepared by the physicians himself, with the help of experienced, assistants in their own pharmacies attached to their clinics. Now a days the trends have been entirely changed. The demand of *Ayurvedic* drugs have been increased by many folds and availability of raw materials are limited. So, there are of chances of production of low quality drugs for the commercial benefits.

The increasing demand for *Ayurvedic* drugs have made it necessary that some sort of uniformity in the manufacturing of *Ayurvedic* medicine should be brought out. The need has also been felt for statutory control to ensure standards of *Ayurvedic* drugs. The quality of final products depends on the raw material used, intermediate process as well as on the pharmaceutical procedure adopted. Intermediate process also include the *Shodhana* procedure, where in different *Shodhana* media have different property which may result in mode of absorption, assimilation and action of the main drug. Various methods have also been prescribed for *Shodhana* of different drugs. Chemical analysis of any drug should be known well before experimental and clinical trials. Chemical study ensures not only chemical constituents but also suggests us standards of any preparation. It not only gives standards of the products but indirectly gives suggestions for further advancement if required. The increasing demand for *Ayurvedic* drugs have made it necessary that some sort of uniformity in the manufacturing of *Ayurvedic* medicine should be brought out. The need has also been felt for statutory control to ensure standards of *Ayurvedic* drugs. To evaluate the quality of finished products, it becomes necessary to subject the drugs for various analytical studies. The drugs should be understood and interpreted in the light of advanced chemistry to provide scientific background. For *Manashila*, which is an important drug of *Ayurveda, Shodhana* has been prescribed in various media and different methods are also available. For the present study, *Shodhana* of *Manashila* as per Classical reference of *Rasa Tarangini* (Ayurvedic Formulary of India, 2003). Analysis was carried out at Central Laboratory, Bhagavathi Ana Labs Pvt. Ltd., Industrial Estate, Sanathnagar, Hyderabad. The analytical study was undertaken with an aim to suggest suitable parameters and their expected values for routine quality control of the below samples

Sample 1. *Raw Khandakya Manashila*
Sample 2. *Shuddha Manashila* (By *Churnodaka*)
Sample 3. *Shuddha Manashila* (By *Bhrungaraja Swarasa*)
Sample 4. *Shuddha Manashila* (By *Nimbu Swarasa*)

Analytical Parameters

The 4 samples were analyzed by using the following parameters:

I. Organoleptic characters:

- Colour - *Rupa*
- Odour - *Gandha*
- Consistency - *Sparsha*
- Taste - *Rasa*

II. Physico-chemical parameters:

- Determination of Foreign Matter of *Ashuddha Manashila*
- Loss on drying at 110^0C
- Ash Value (Water insoluble)
- Ash Value (Acid insoluble)
- Water Soluble Extractive
- Alcohol Soluble Extractive
- Determination of Sulfur as S

III. Inductively coupled Plasma – Mass spectroscopy (ICPMS)

Table no 5.2 reveals that Sample 1 i.e. *Ashuddha Manashila* is having reddish with brown tinge and shiny, peculiar odor with crystalline smooth surface. Sample 2 i.e. *Shuddha Manashila (Churnodaka Shodita)* was reddish brown with little shiny, peculiar odor, crystalline smooth texture. Sample 3 i.e *Shuddha Manashila (Bhringaraja Swarasa Shodhita)* was bright reddish shiny color, peculiar odor, and crystalline smooth texture. Sample 4 i.e *Shuddha Manashila (Nimbuka Swarasa Shodhita)* was yellowish orange non shiny, peculiar odor and flakes, which were later converted into powder. The first three samples were having *Katu Tikta Rasa* and fourth sample is having *Katu, Tikta, Amla Rasa*

Table no. 5.3 reveals that in *Ashuddha Khandakya Manashila* there is 2% of foreign matter, which reveals the adulteration, is not more. Loss on drying was found less in *Ashuddha Manashila* and more in *Shuddha Manashila (Nimbuka Swarasa Shodhita)*. Water soluble ash was found less in *Shuddha Manashila (Nimbuka Swarasa Shodhita)* and more in *Shuddha Manashila (Bhringaraja Swarasa Shodhita)*. Acid insoluble ash was found less in *Shuddha Manashila (Churnodaka Shodita)* and more in *Shuddha Manashila (Bhringaraja Swarasa Shodhita)* and *Shuddha Manashila (Nimbuka Swarasa Shodhita)* . Water soluble extractive was found less in *Ashuddha Manashila* and most in *Shuddha Manashila (Nimbuka Swarasa Shodhita)*. Alcohol soluble extractive was found less in *Shuddha Manashila (Bhringaraja Swarasa Shodhita)* and more in *Shuddha Manashila (Nimbuka Swarasa Shodhita)*. Determination of Sulfur reveals that it is less in *Shuddha Manashila (Nimbuka Swarasa Shodhita)* and more in *Shuddha Manashila (Bhringaraja Swarasa Shodhita)*. Arsenic as As is less in *Shuddha Manashila (Bhringaraja Swarasa Shodhita)* and more in *Shuddha Manashila (Nimbuka Swarasa Shodhita)*. By performing *Shodhana* procedure, moisture content was increased. Ash value was reduced, water soluble ash was reduced. Acid insoluble ash was increased. Water soluble extractive was increased compared to *Ashuddha Manashila* and was maximum in *Shuddha Manashila (Nimbuka Swarasa Shodhita)*. Alcohol soluble extractive was also increased compared to *Ashuddha Manashila* and was maximum in *Shuddha Manashila (Nimbuka Swarasa Shodhita)*. Sulfur as S was equal in most of the samples but was reduced in *Shuddha Manashila (Nimbuka Swarasa Shodhita)*. Arsenic as as was equal and slight decrease was found.

IV. Phase identification by diffract gram using x ray diffraction method (Mullen *et al*., 1972)

From Auger parameter (AP) values it appears that the samples are As2S2. AP values for AS-O are much lower than that for sulphide. For example AP:As203 = 1263.3 and AP: As205 = 1263.6. We tried to get at% of As and S on the surface. However XRD can get the exact phase. Trace of oxide is found in sample 2 and sample 4. The amount of oxide (As-O) is shown in the table 5.3. Its small, but its presence is very much seen in the spectra. Sample 3 was sputtered for 30 min (removing app 60 A) and the oxide was removed. The stoichiometric ration of As and S was seen. So the oxide may be residing only on the sample surface.The change of color of the sample might have caused by the S on the surface. We found that the S amount varies in different samples as shown in Table 5.3. This shows the role of different media in deciding the absorption, assimilation, effect and excretion of the drug. So due to these there may be changes in mode of action and also disease and disease condition.

Conclusion

- *Manashila* is used both internally and externally.
- Out of three types of *Manashila, Khandakhya Manashila* is therapeutically used in most of the *Rasa Granthas (Uttarottara Sreshta)* and yields more *Satwa.*
- *Shuddha Manashila* is not used alone. It is administered along with herbal drugs or is an important ingredient in popular formulations like *Shwaskuthara Rasa, Kalanala Rasa, Trilokyachintamani Rasa, Kshayakesari Rasa, Manashiladhi Ghrita* etc.
- *Ashuddha Khandakhya Manashila* is reddish, brownish black tinge with shining crystalline smooth texture and having peculiar odor.
- *Shuddha Manashila (Churnodaka Shodita)* was reddish brown with little shiny, peculiar odor, crystalline smooth texture.
- *Shuddha Manashila (Bhringaraja Swarasa Shodhita)* was bright reddish shiny color, peculiar odor, and crystalline smooth texture
- *Shuddha Manashila (Nimbuka Swarasa Shodhita)* was yellowish orange non shiny, peculiar odor, smooth and flakes, which were later converted into smooth powder
- The first three samples were having *Katu Tikta Rasa* and fourth sample is having *Katu, Tikta, Amla Rasa*
- All relevant analytical data of samples of *Ashuddha* and *Shuddha Manashila* are showing difference in their physical and chemical values. It shows the importance of process of *Shodhana*, which is probably responsible for safe therapeutic uses of *Manashila.*
- This shows the role of different media in deciding the absorption, assimilation, effect and excretion of the drug. So due to these there may be changes in mode of action and also disease and disease condition.
- The properties of liquid media embedded into the *Manashila* during the process of *Shodhana* may augment the effect of *Manashila*.

To prove th **PHARMACEUTICAL STUDY:**

Behind all the pharmaceutical procedures, *Shodhana* has its prime importance, because it is the *Shodhana* by which we can use all the substances as medicine from herbal to mineral in origin, even though they are having many toxic effects on human body. Shodhana is the process of removal of physical, chemical impurities and potentiating of the drugs (Sri Vagbhatacharya *et al*., 1999; Ayurvedic Formulary of India, 2003) By the process of *Shodhana*, the virtues of properties of *Shodhana Dravyas* are inherited into a substance. Standardization of *Ayurvedic* formulations and their manufacturing processes are the need of present hour. So one can check adulteration, identify the spurious material, improve the quality of drugs and maintain the uniformity of the products in different batches. In this way only *Ayurvedic* drugs can be made acceptable worldwide. There are various pharmaceutical processes which have been described for *Shodhana* such as *Swedana, Nirvapa, Avapa, Bharjana, Galana, Shoshana, Patana*, *Bhavana* etc. These are not merely the chemical purification but in a nutshell it can be said that to make substances bio-assimilable, they are subjected to *Shodhana*, the specific process of the addition and separation according to the need of our body. So it has become our prime duty to establish the proper *Shodhana* method in the scientific way in regards to get specific therapeutic effect and get maximum yield as well fulfilling all necessary parameters to make that substance best therapeutic. In the context of present study *Manashila* (*Khandakya*) *Shodhana* have been performed by *Churnodaka, Bhrungaraja Swarasa and Nimbuka Swarasa* as mentioned in *Rasa Tarangini* (Mullen *et al*., 1972). Practical study was carried out under the supervision of our Guide in Dept. of Rasashastra & Bhaishajya Kalpana, N.K.J.A.M.C. & P.G. Centre, Gumpa, Bidar.

Practical study is comprised of

Preparation of *Churnodaka*, Practical 1.
Manashila Shodhana by *Churnodaka* Practical 2.
Preparation of *Bhrungaraja Swarasa,* Practical 3.
Manashila Shodhana by *Bhrungaraja Swarasa,* Practical 4.
Preparation of *Nimbuka Swarasa*, Practical 5.
Manashila Shodhana by *Nimbuka Swarasa*, Practical 6.

Preparation of *Churnodaka* (Sri Sadananda Sharma *et al*., 1989)*:* (Practical 1)

For this preparation the reference of *Rasa Tarangini* 11/216-218 is followed. The utensils used are Stainless steel vessels, Weighing Balance, Clean cotton cloth, measuring jar, Spoons. *Churnodaka* was prepared in the ratio of *Churna* : Water i.e. 1:240 where *Churna of* about 4gm was taken in a clean stainless vessel and water (portable) of about 960 ml was added and stirred well. When *Churna* got dissolved in water it turned milky. It was kept stand still for 9 hours. The supernant fluid was transparent light milky in color was collected and filtered with a clean cloth and kept preserved in green glass bottle. It was about 900 ml and sour astringent taste. (Figure-7)

***Manashila Shodhana* by *Churnodaka:* (Practical 2)**

The reference of *Rasa Ratna Samucchaya* 3/70 was followed. The utensils used are Stainless Steel Vessel, Spatula, Weighing Balance, Measuring Jar, Clean Strong Cotton Cloth etc. *Ashuddha Manashila* of 200 gm and *Churnodaka* of about 900 ml was used. *Nimajjana Sanskara* was adopted**.** The physical impurities like stone, sand etc. were manually cleaned. *Ashuddha Manashila* was taken in a clean *Khalwa Yantra* and made in to small pieces. The color of *Ashuddha Manashila* was reddish, brownish black tinge with shining and having

peculiar odor. The pieces were spread on a clean strong cotton cloth and *Pottali* was prepared. This *Pottali* was kept in a clean stainless steel vessel. Then *Churnodaka* was added in such a quantity that the *Pottali* got completely immersed in *Churnodaka,* and kept stand still for whole night. The process is repeated for 3 days. Every day fresh *Churnodaka* was used. During the process color of the *Churnodaka* changed to slight reddish color. After that the *Pottali* was washed with warm water and the *Manashila* pieces were collected carefully. *Manashila* pieces were washed with warm water and dried for 6-8 hours. Reddish brown with little shining small pieces of 195gm of *Shuddha Manashila* was collected after proper drying. It took atleast 4 days for this complete process. (Figure-8)

Preparation of *Bhrungaraja Swarasa:* (Practical 3)

General method of *Swarasa* preparation was followed. The utensils used are stainless steel vessels, Knife, Mixer Grinder, Weighing Balance, Clean cotton cloth, Measuring jar, Spoons. Totally Bhrungaraja of about 10 kg was used. *Bhrungaraja* was washed in water and cleaned externally. With a clean knife it was chopped in to small pieces. Then put in mixer grinder and Kalka was prepared. During the grinding little frothing was observed. As it was very hard to remove the *Swarasa*, 250 ml of water was added during grinding. Then *Kalka* was squeezed with a clean cloth and juice was extracted. It was filtered with clean cotton cloth and filtered liquid was collected as *Bhrungaraja Swarasa.* It took approximately 1.30 hours to extract the juice. The color of extracted juice obtained was dark greenish and 1.8 litre with *Katu, Tikta Rasa.* (Figure-9)

***Manashila Shodhana* by *Bhrungaraja Swarasa*: (Practical 4)**

For the present practical the reference of *Rasa Tarangini* 11/110, was followed. The utensils used were stainless Steel Vessel, Gas Stove, Spatula, Weighing Balance, Measuring Jar, Clean Strong Cotton Cloth, and Mercury Thermometer etc. *Ashuddha Manashila* of about 200 gm and *Bhrungaraja Swarasa* of about 1.8 litre. The *Sanskara* adopted was *Swedana Sanskara.* Physical impurities like stone, sand etc. were manually cleaned. *Ashuddha Manashila* was reddish, brownish black tinge with little shining and having peculiar odor. *Ashuddha Manashila* was taken in a clean *Khalwa Yantra* and made in to small pieces. The pieces were spread on a clean strong cotton cloth and *Pottali* was prepared. This *Pottali* was tied to a clean iron rod and the *Pottali* was suspended in a clean stainless steel vessel. Then the *Swarasa* was added in such a quantity that the *Pottali* got completely immersed in *Swarasa* and it should not touch the bottom of the vessel. It was kept on gas stove and fire was ignited (Gas knob was set on sim). This arrangement resembles the *Dola Yantra.* Little quantity of *Swarasa* was added as the *Swarasa* evaporated. Heating should be controlled and temperature should be maintained about 62-95^{0}C inside the vessel. The apparatus was heated for 12 hours (Four *Yama*). During boiling the color of the *Swarasa* changed to reddish color. During heating little peculiar odor of *Bhrungaraja* was felt. After that the *Pottali* was washed with warm water and the *Manashila* pieces were collected carefully. *Manashila* pieces were washed with warm water and dried for 6-8 hours. Bright reddish shining small pieces of *Shuddha Manashila* weighing 192 gm was collected after proper drying. It took atleast 2 days for the complete process. (Figure-10)

Preparation of *Nimbuka Swarasa:* (Practical 5)

For the present practical general method of *Swarasa* preparation was followed. The utensils used were stainless steel vessels, Knife, Clean cotton cloth, Measuring jar, Lemon Squeezer. About 10 numbers (Medium size) of *Nimbuka Phala* (Lemon) were taken and washed in water and cleaned externally. With a clean knife it was cut in the middle in to two equal pieces. Then put in lemon squeezer and *Swarasa* was squeezed. It was filtered with a clean filter and filtered liquid was collected as *Nimbuka Swarasa. Swarasa* of about 50 ml was obtained from 10 *Nimbukas.* It took approximately 30 min to squeeze the juice. The color of extracted juice was translucent dirty white color. Its taste is *Amla Rasa* (Figure-11)

***Manashila Shodhana* by *Nimbuka Swarasa:* (Practical 6)**

The procedure was done as per the reference of Rasa Tarangini 11/111. The utensils used are stainless Steel Vessel, Weighing Balance, Measuring Jar, Clean Strong Cotton Cloth, *Khalwa Yantra* (Porcelain) etc.

Ashuddha Manashila of about 200gm and *Nimbuka Swarasa* Q.S. was taken for the present practical. The Sanskara adopted was *Bhavana Sanskara*[49] Physical impurities like stone, sand etc. were manually cleaned. *Ashuddha Manashila* was reddish brownish black tinge with little shining and having peculiar odor. It was taken in a clean *Khalwa Yantra* and made in to small pieces. Then lemon juice of Q.S. was added until the *Churna* gets completely dipped in *Swarasa*. Slowly *Bhavana* (trituration and lavigation) for at least 6 hours a day. Then after drying of *Swarasa* the next day again fresh *Swarasa* is added and *Bhavana* was given. *Bhavana* is repeated for 7 days. Remarkable constant increase in weight was noted. Odor of *Bhavana Dravya* along with the smell of *Manashila*. Shiny particles completely disappeared. After last *Bhavana* it is kept for complete drying. Yellowish orange small flakes of *Shuddha Manashila* were collected after proper drying. *Shuddha Manashila* of about 205 gm was obtained. It took about 8 days for the preparation. (Figure-12)

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