



ORIGINAL RESEARCH PAPER

Ayurveda

PREPARATION & PHYSICOCHEMICAL ANALYSIS OF RASAKA SATTVA BHASMA

KEY WORDS: Rasaka sattva bhasma.

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ABSTRACT

Rasaka is very important element of Maharasa varga. It is still considered ambiguous but in all opinions it contains Zinc undoubtedly. Hence current study is aimed at Identification of Rasaka, Shodhana of Rasaka, Sattvapattana of Rasaka, Marana of Rasaka Sattva with physicochemical analysis at all stages.

INTRODUCTION:

Rasaka is an ore of Zinc, which was used to extract 'Yashada' (Zinc) in ancient times. It was also used in the preparation of Brass (Pittala). The synonyms, types, shodhana methods, sattvapattana vidhi of Rasaka was elaborately mentioned in Rasarnava the oldest treatise of Rasashastra. Since beginning it was known by the name Rasaka or Kharpara. The sattva obtained from it was named as "Yashada" after the invasion of Arabians to India after 14th century.

Rasaka is still considered ambiguous but in all opinions it contains Zinc undoubtedly. hence market sample containing Zinc is considered for this study.

Sattvapattana is an important process described by ancient Rasacharyas to extract purest form of various rasadravyas which were used for dehasidhhi and lohasidhhi. This process of extraction was not known to the Europeans until 1721 A.D.; but it was known to Indians from 9th century or even before that.

Sadly very little progress or research has been done in this field. Sattva bears more potency than bhasma, even though, the actual usage of sattva in clinical practice is not seen. This arouses a dire need to study the preparatory methods of sattva and its merits and demerits.

AIM:

To provide physicochemical standards for Rasaka Sattva bhasma.

METHODOLOGY OF PREPERATION OF RASAKA SATTVA BHASMA:

Preparation:

A. Identification Of Rasaka

Market samples were collected from various sources and were analyzed for presence of Zinc.

Only one sample contained sufficient amount of Zinc which was available in the market by the name of Jastachi Kalkhapari.

B. Shodhana Of Rasaka

Ref: Rasa Ratna Samucchaya 2/156

Shodhana of Rasaka was done by Nirvapa in Beejpooraka Rasa.

Ingredients And Its Quantity:

Rasaka400gms
Bijapoorak swarasa.....As required.

Observations Shodhana Of Rasaka

No. of process	Bijapoorak Swarasa used	pH of Bijapoorak swarasa	Qty. of Rasaka	Color changes	Effervescence	Smell
1 st	600 ml	2	400 gm	Reddish White	++++ +	Sweetish
2 nd	600 ml	2	410 gm	Reddish Gray	++++	Sweetish
3 rd	600 ml	2	375 gm	Grayish	+++	Sweetish
4 th	600 ml	2	340 gm	Grayish	++	Rotten egg
5 th	600 ml	2	300 gm	Grayish	++	Rotten egg
6 th	600 ml	2	300 gm	Grayish Black	+	Rotten egg
7 th	600 ml	2	300 gm	Grayish Black	+	Rotten egg

C. Rasaka Sattvapattana:

Ref: Rasa tarangini 21/208.

Procedure:

- Shodhita Rasaka is placed in a Khalwa yantra and made into fine powder.
- Equal quantity of all the ingredients was added to Rasaka
- This combination was mixed well by triturating.
- After it attained proper consistency the mixture was placed in moosha.
- Then tivragni was given by using coal to this moosha
- Color of moosha becomes red after 1 hour.
- Tivragni was continued for 2 hours.
- At start fumes came out of moosha with typical crackling sound.
- Smell of Sulphur was observed at this moment.
- Then yellowish colored flames were seen.
- Then bluish & multicolored fumes and flames were seen.
- Agni was stopped when white colored flames were seen which indicates completion of Sattvapattana process.
- Then all the content of moosha was emptied in an iron pan while the content was still hot.
- Tiny silver colored ball like structures were seen along with ash and black clay like particles
- The mixture was water washed several times to remove ash and other impurities
- The sattva was then collected.

Observation During Sattvapātana:

Following observations were made during the process

- When shuddha Rasaka was mixed with ingredients indicated for sattvapātana it formed a uniform clay like substance of yellowish color.
- This mixture was then subjected to tivragṇi.
- At start fumes came out of moosha with typical crackling sound
- Then multicolored fumes and flames were seen (about 15 minutes later). Colored flames are indicators of separation and liquefaction of metallic contents in the mixture. This process is termed as Bijavart or Lohavart in Rasashastra.
- Smell of burning was experienced after this.
- Moosha turned red due to heat in about 30 min.
- Contents of moosha were liquefied by this time which was evident on stirring with a Shalaka.
- Agni was stopped when white colored flames were seen which indicates completion of Sattvapātana process. White flames indicate total separation of metallic contents and completion of Sattvapātana process. This process is termed as Shuddhavart.
- Then all the content of moosha was emptied in an iron pan while the content was still hot it was black in color.
- Tiny silver colored ball like structures were seen along with ash and black clay like particles
- The mixture was water washed several times to remove ash and other impurities. With each wash silvery material became more evident.
- The sattva was then collected which was silvery black colored.

D. Rasaka Sattva Marana

Ref: Rasa Ratna Samucchaya 2/168

Procedure

- Shuddha Rasaka was taken in Iron vessel
- It was heated with continuous stirring
- Shuddha Haratala was sprinkled and mixed well with constant heat and stirring
- This process was repeated until both were mixed well (60 min)

Observations:

- Shuddha Rasaka was taken in Iron vessel. It was heated with continuous stirring
- Shuddha Haratala was sprinkled and mixed well with constant heat and stirring
- Rasaka Sattva became red when heated.
- When Haratala was added to it small red flames were seen.
- For some moments the whole mixture turned yellow then again turned black.

Physicochemical Analysis Of Rasaka, Shuddha Rasaka And Sattva Bhasma:

Organoleptic Characters:

Character	Raw Rasaka	Shudha Rasaka	Rasaka Sattva	Sattva Bhasma
Colour	Reddish white	Yellow	Black	Black
Odour	Characterless	Amla	Odourless	Odourless
Taste	Characterless	Amla	Tasteless	Tasteless
Touch	Rough	Rough	Rough	Smooth

Physicochemical Characters:

Character	Raw Rasaka	Shudha Rasaka	Rasaka Sattva	Sattva Bhasma
pH	9.46	9.08	8.18	8.38
Total Ash	63.28%	76.84%	96.57%	99.46%
Acid insoluble Ash	5.49%	6.39%	20.16%	26.47%
Moisture content	<0.1%	0.28%	<0.1%	<0.1%
Zn content	51.19%			58.08%

Atomic Absorption spectrophotometry of Rasaka Sattva Bhasma:

Sr. No.	Constituents	Result (%)
1	Zn	58.08
2	Na	1.06
3	K	0.87
4	Fe	1.24

Inference:

Zn is obtained mainly as Sattva of Rasaka along with some other metals in traces

DISCUSSION:

• **Pharmacological study**

Collection Of Sample:

Before going for the preparation of Rasaka sattva bhasma, preliminary works like, Identification of Rasaka, collection / procurement of drug, shodhana and Sattvapātana were adopted.

As the Rasaka has synonym as, "Yashada Karana" it can be identified as an ore of Zinc. According to modern chemistry three rich sources of Zinc are mentioned. They are Zinc carbonate, Zinc oxide, Zinc sulphide.

Before selecting market sample, the Rasaka samples available in local market were collected and analyzed for Zinc percentage. It was found that, many of these samples contained only 1.59% or less percentage of Zinc; major percentage was mud and Iron.

Shodhana Procedure Of Rasaka:

Method adopted for shodhana is according to Rasa Ratna Samucchaya 2/156. Rasaka shodhana was done by Nirvapa in Bijapooraka Rasa (pH-2), this process was repeated 7 times as directed in the text and following observations were made.

After Nirvapa in swarasa; effervescence was observed. With each process, effervescence continued but it decreased gradually. Effervescence indicates the presence of carbonate in it. Color of sample also changed from yellowish grey to blackish grey. Size of the sample reduced with each process due to reaction between carbonate and acid. Percentage of loss during Shodhana was 25%.

Concept Of Sattvapātana:

The Saar or basic content of a Dravya is called as Sattva. It is said that sattva of dravyas is 100 times more effective. R.R.S. defines sattva as; when sattva yukta dravyas are mixed with amla, kshar and dravyas of dravak gana and heated in a Koshthi extract of the sattva yukta dravyas is obtained which is called Sattva. Unfortunately very little work is done on this subject.

Sattvapātana Procedure Of Rasaka:

The method of the preparation of the Rasaka sattva is according to R.T. 2/208. All the ingredients were authenticated from Dravyaguna department of the institute. All contents were mixed with Shuddha Rasaka and kept in Mooka moosha. Moosha was then subjected to high heat of furnace (Bhatti/ Koshthi) following observations were made during the process.

At the beginning flames of red color were observed with typical crackling sound because of water contents in the mixture. Gradually color of the flame changed to blue and finally white. Colored flames are indicators of separation and liquefaction of metallic contents in the mixture. This process is termed as Bijavart or Lohavart in Rasashastra. White flames indicate total separation of metallic contents and completion of Sattvapātana process. This process is termed as Shuddhavart.

Though not indicated in texts the Sattva obtained contained

many organic wastes in form of ash. It was washed with water as heavy particles of Sattva form a residue. Small balls or droplets of Sattva were observed which were blackish silvery in color. Tankana melts during the procedure helping rise of temperature. Other organic materials go through a reaction with oxide form of metal. Both these procedures i.e. heat and reaction of organic material with oxides helps in extraction of Sattva.

Marana Of Rasaka Sattva:

The method of preparation of Rasaka Sattva bhasma is according to R.R.S. 2/168. The sattva obtained cannot be used as medicine directly as it is in pure metallic form. Hence marana of sattva is very important. Shuddha Haratala is used for this process. During this process the metallic sattva is converted to powder form. It changes its color, loses its malleable and ductile properties, and finally is ready to use for medicinal purpose.

All methods given for Rasaka sattva marana in all texts are similar in two ways; 1) all texts have used Kataha yantra (Kadhai) for this procedure. This method of marana is used only for marana of Pooti Loha. 2) Haratala is used in abundance for this process, which is Ariloha of Vanga and also used in Yashada marana. These common factors indicate that Rasaka sattva can be Yashada.

CONCLUSION:

Zn is main content of Rasaka. In Rasaka sattva, amount of Zn is 58%.

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