



Chapala Nirnaya – An Experimental Study to Identify the Chapala

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ABSTRACT

Chapala is a controversial drug in the field of Rasashastra having medicinal importance in Ayurvedic system of medicine. Many Rasashastra Granthas described Chapala is one of the mineral drug which comes under the group of Maharasavarga, due to its less utilisation, controversial opinion and absence of validation of Chapala. The use of Chapala Bhasma is not seen in the present formulations. The Rasashastra text book describes Chapala as mineral Bismuth or mineral Selenium. To overcome from controversy, the present study was undertaken on physico chemical characterisation of Chapala, for its validation, identification, authentication and utilisation of Chapala. The Chapala is mainly used therapeutically in the form of Bhasma for management of Shoola (Pain), Gulma-tumour, Prameha- Diabetes mellitus, Pradaravikara-Gynaecological disorders, Artavavikara- menstrual disorders. Raw drug characterisation and identification plays a vital role for assuring the therapeutic potential of final drug. The study is carried by following characterising principles explained in Rasa Grantha with reference to availability, origin, association with other minerals, types and its physico chemical parameters. The results of physical properties of Chapala were compared physical properties of mineral Bismuth and mineral Selenium. In this study, it was observed that Chapala is mineral selenium with all characters explained as Grahya Lakshana.

Keywords: Chapala, Maharasa, Bismuth, Selenium, Physico chemical, Rasashastra

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INTRODUCTION

Chapala is a substance; mineral in origin and it is included in Maharasa group of drug. There are many literatures were found in Rasashastra, but the explanation of Chapala is given in very few Rasashastra Granthas. Rasarnava the earliest book to mention the properties and action of Chapala is salient about its occurrence. In these texts we can get the explanation regarding origin, types, properties, qualities, methods of shodhana (purification), marana (incineration), satwapatana, pharmacological action, and therepeutical indication of Chapala. But as time passed, uses of Chapala become less and gradually disappeared. Now a day there is no specific mineral or metal, which termed as Chapala. The present day's scholars of Rasashastra have different opinions regarding Chapala. Some of them try to specify Bismuth as Chapala; others opine Selenium should be considered as Chapala. To rule out these differences of opinions proper identification by classical and modern method, pharmaceutical, pharmacological study should be carried out.

MATERIAL AND METHODS

The study is designed to identify and validate the Chapala in present scenario, the different following parameters explained in Rasa Granthas are taken for the study

- 1-Swarna makshikakhanijotbhava [1] it occurs or originates from copper pyrite ores
- 2- Naga Sambhavaha Chapala [2] it is available with led
- 3-Vanga Sambhava Chapala [2] it is associated with tin
- 4-Vangavat dravate Vanhau [3] it melts like tin
- 5-The Grahyalakshana of Chapala [4].

Swarn makshikakhanijotbhava

The 4 different ores of Chalcopyrite (Swarna makshika) is collected from different parts of the country and subjected for AAS (Atomic Absorption spectroscopy) – among 4 samples the presence selenium in different percentage is documented but there was no trace of Bismuth is identified. (Table 1).

Table 1: AAS analysis of Swarna makshika Samples collected from different states

ASS-Method	Cu	S	Se	Bismuth
Sample-1	34%	63.02%	2.98%	Not Found
Sample-2	42%	52%	6%	Not Found
Sample-3	38%	58.5%	2.9%	0.03%
Sample-4	41%	57.2%	1.8%	Not Found

Vangavat Dravate Vanhanou

Melting point test is conducted on Melting Point Detector 3 times to Standardize the melting point. *Vangavat dravate* reference to melts like tin, the comparators were analysed with melting point of Tin-23.9°C. (Table 2).

Table 2: Melting Point test values

	1 st	2 nd	3 rd	
Bismuth	274°C	272.2°C	273°C	N-271.4°C
Selenium	220°C	220°C	218°C	N-221.4°C

Naagsambhava and Vangasambhava Chapala

It refers that the Chapala is mainly originated from the ores of Lead and Tin. When we go through the modern metallurgy the Selenium is originated from ores of Clasthalite, Psedemite and Letharge. But Bismuth occurs in its native form and found with any ores of Lead or Tin. (Table 3)

Table 3: Comparison of Bismuth and Selenium with Grahyalaxanas of Chapala

Chapala	Selenium	Bismuth
I. Utpathi (Origin) Makshikabhumiyo dhava (which occurs in the area of cu-mine)	+	-
II. Bheda (Types)[10]		
Sweta	+	+
Krishna	+	+
Harita	+	-
Rakta	+	+
Karbura	+	-
Peeta	+	-
Goura	+	+
Vangachapala	+	-
Nagachapala	+	-
III Physical properties ⁴	+	+
- Sphatikhabha (Transperent crystal)	+	-
- Shadashra. (Hexagonal-3m)	+	-
- Guru (heavy)	2	2-2.5
- Shighda (Malleable)	+	-
- Vanga vat dravate (Which melts in 232 ^o) c	217°C	271.3°C

(+ denotes properties present, - denotes properties absent)

DISCUSSION

Occurrence: In Rasapaddatichapala is to occur where Makshika is found abundantly. Bismuth & Selenium occurs in association with copper. But Bismuth is found free in nature in mines, associated with Zinc, Copper, Tin & Silver ores. Naturally it is chiefly found in oxide, sulphide, & 2 carbonates. Selenium always found in conjunction with Copper & Sulphur. Selenium has been mainly obtained from anode slimes in Copper refineries [1].

Availability: Bismuth is available in 4 allotropic forms like Oxide, Sulphate, & Carbonate. Now a days mining of Bismuth is stopped so it has become rare element to procure. Selenium is mainly produced by smelting copper i.e., 1.5kg of Selenium is obtained from smelting 1 tons of Copper. Which is similar with the versions of Rasaacharyas [2].

Drug selection: By comparing the origin, occurrence, availability, types, properties (both physical & Chemical), and their the rapeutical properties, it can be said that Selenium is having most of the properties of Chapala mentioned in classics compared to Bismuth [3].

As there are different opinion regarding Chapala in terms of identification & availability the scholars opines that Chapala as Bismuth and some says Selenium. To rule out identification & Comparison both the drugs ie, Bismuth & Selenium were taken for the study. As there is a scarcity in natural or native forms of

Bismuth & Selenium pure metal sample were taken for the study and subjected for the processes, which are mentioned in classics [4].

The Samples of makshika were collected from Gujarat (Sample 1), Karnatak (Sample 2), Uttara Pradesh (Sample 3) and Rajasthan (Sample 4). All these samples show presence of Selenium. The melting test and grahyaagrahyalaxan as of Chapala are evidently seen in Selenium compared to Bismuth [5].

CONCLUSION

By this study it is observed that the Origin, Occurrence and physical properties explained for Chapala is observed more in Selenium compared to Bismuth. Hence one can consider Selenium as Chapala.

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