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A REVIEW ON CHAPALA- A CONTROVERSIAL MINERAL IN INDIAN ALCHEMY

HUSSAIN G^{*1} AND PAGAD A²

¹Associate Professor, ² Assistant Professor, Dept. of Rasashastra & Bhaishajya Kalpana, Sri
Dharmasthala Manjunatheshwara College of Ayurveda & Hospital, Hassan

***Corresponding Author: Ms. Gazala Hussain: E Mail: gazalanabeel@gmail.com**

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ABSTRACT

Rasashastra is a branch in Ayurveda pharmaceutics that deal with Indian alchemy. Varied origin of dravya are utilized in Ayurveda pharmaceutics namely metals, minerals, gemstones, marine drugs, etc. Some of the minerals are rare or difficult to procure at present. Some ores are a question of controversy. Though a detailed description about the properties, types, selection criteria are available in the texts of Ayurveda pharmaceutics, it remains a subject of controversy in identifying, and selecting the genuine mineral at present. Chapala is one such mineral ore that is mentioned under the group of maharasa. At present various scholars have opined their views related to it; a few opine it to be Bismuth, Selenium, ore of tin, etc. But a recent study on Chapala has put light, that it is an ore of Bismuth.

Keywords: Chapala, Rasashastra, Bismuth, Selenium, Ore

INTRODUCTION

Chapala is grouped under Maharasa in Rasashastra where minerals that are profusely utilised in Parada samskara are grouped. Chapala is named so as it melts at a low temperature like tin. The origin of

Chapala is from the mines of Makshika (Pyrite). It is said to be useful in binding mercury (rasa bandhakara). In different texts of rasashastra, varied types of Chapala are explained.

Table 1: Varieties of Chapala

Sl. No.	Based on the colour		Based on the metallic content
1	Gaura (yellow) Hemabha (colour similar to gold)	Shweta (White)	Swarna
2	Sweta (white) Taraabha (colour similar to silver) Above two are used for Rasa bandha	Krishna (Black)	Tara
3	Aruna (Red)	Harita (Green)	Tamra
4	Krishna (Black) [1]	Rakta (Red) [2]	Naga
5			Vanga
6			Tiksna [3]

Various colours of chapala described in ancient texts may be attributed to the traces of elements present in the mineral such as Sulphur, Antimony, Iron, Copper, Arsenic, etc. The above varieties may be correlated with the following varieties of Bismuth (mineral) described in modern literature; where the Shweta type of Chapala is said to be related to Native Bismuth, Pita variety to Bismuth Oxide or Bismuth ochre, Aruna to Bismuth sulphide or Iron oxide and Krishna as Bismuth Sulphide.

Modern Description:

The Bismuth which is found in nature is called Native Bismuth that has hexagonal, rarely rhombohedral crystals and is usually reticulated, platy or with compact masses. Basal Cleavage generally conspicuous with Hardness of 2- 2.5, Specific Gravity- 9.7, brittle, slightly malleable when heated, a metallic lustre, opaque, reddish white often with brassy turnist colour, streak shiny lead grey coloured.

Native Bismuth often contains traces of Arsenic, Sulphur, Selenium and Tellurium, usually found in veins associated with Silver, Cobalt, Lead, zinc and Tin ores. Metallic Bismuth is obtained from Native Bismuth and Bismuthinite (Bi_2S_3) which closely resembles with stibnits (Sb_2S_3) but heavier than stibnite. The metal is used in the manufacture of easily fusible alloys with lead, Tin, Copper, Antimony and cadmium. The melting point of some of these alloys is as low as 64°C [4].

Properties:

It is said to have properties of lekha (scraping), snigdha (unctuous), does loha and dehasiddhi, increases the properties of mercury, tikta (bitter) in taste, ushna veerya (hot in potency) and madhura in vipaka.

Chapala is lustrous like Sphatika (alum) having six edges, is snigdha (unctuous), heavy does alleviation of tridosha, is vrishya (aphrodisiac) and does bandhana of Parada [5].

Opinion of various scholars:

In a treatise of Rasashastra, Yadavji quoted the opinion of late Dr. Vamana Ganesh Desai which he has written in his book 'Bharatiya Rasashastra' and according to this chapala may be taken as Bismuth.

It is also viewed by Late Sri D. A. Kulakarni in his commentary on 'Rasaratna samuccaya', three reasons for this i. e., Bismuth melts early on fire like tin than the other metals, its appearance is similar to sphatika i. e., having six facets and is available with sulphur containing minerals like swarnamakshika in mines. All these points have been mentioned in the ancient texts also regarding chapala. More over the specific gravity of bismuth is also 9 and chapala is also claimed to be guru (heavy) [6].

As per Prof. D A Kulkarni in the commentary of Rasaratna Samucchaya he opines that Bismuth ore are found naturally and that is termed as Chapala in rasashastra. The varieties of Chapala as mentioned in Ayurvedic texts correlate with the compounds of bismuth. For example, bismuth oxide is yellowish-white in colour (Shweta chapala), bismuth sulphide is black in colour (Krishna chapala), whereas bismuth sulphide, when rich in iron oxide, looks red in colour (Aruna chapala) [7].

But none of the properties of Chapala, mentioned in Ayurvedic texts, are found in bismuth. Moreover, it is mentioned that Chapala melts like Vanga (tin). The melting point of tin is 232°C, as against that of bismuth is 271°C. Thus, rescinding the concept that Chapala can be taken as Bismuth [8].

In the text, Rasamritam author opines that chapala has been included in maharasa group where all the drugs are minerals, the rasaka included in this group is a mineral of Zinc and from which brass is made in ancient times. Likewise chapala mentioned in ancient texts under Maharasa group may also be taken as a mineral related to vanga (tin) metal as according to text also it is said to melt early like that of vanga (Tin).

Hence the possibility of it being a mineral of tin is more acceptable than any other mineral. It may also contain some amount of Iron which when subjected to Marana may convert into red coloured bhasma as has been claimed in the text and by Yadavji [9].

Yadavji also quoted the opinion of late Sri Narendranath mitra referred to in 'Rasatarangini' and according to that chapala is considered to be a selenium containing mineral.

The properties, varieties and medicinal properties of Selenium are as follows: Selenium looks like steel, shining grey in colour. Goura variety of Chapala is also grey in colour and it resembles one of the properties. The cut surface of selenium shows flowery designs. It correlates with 'Pushpakriti' as described in Ayurvedic texts. One variety of selenium is red, which melts between 170°-180°C. Aruna and Krishna varieties of Chapala mentioned in texts, melt quickly i.e. they have a low melting point. Pure Selenium melts at 217°C, which is near to that of tin (232°C). Selenium crystals are hexagonal in structure. The same has been described in texts of Rasashastra. Selenium, in modern medicine, is used in sterility, debility, orchitis, etc. Similarly, Chapala is aphrodisiac and strengthens the body.

Though selenium is invented recently, the similarities between Chapala and Selenium indicate that the ancient Ayurveda scholars knew this metal since those days. The inferences drawn from the similarities between Chapala and Selenium, does not indicate that precisely Chapala means Selenium. But the traditional thought that Chapala means Bismuth, is said to be far from the truth based on the above arguments. Thus as per the above reasoning Chapala is to be taken as Selenium [10].

A research was carried out where following the classical and contemporary knowledge, an attempt was made to evaluate and validate the genuine Chapala by comparing the physical properties of mineral Bismuth and mineral Selenium and it was concluded that genuine Chapala is Bismuth mineral [11].

CONCLUSION

Chapala is a mineral that is mentioned under the category of Maharasa in the treatises of Rasashastra. It is correlated to various minerals and metals, like Bismuth, Selenium or a mineral of tin. An analytical study carried out on Chapala has put light that it can be taken as a mineral ore of Bismuth. The research article highlights that Chapala is mineral Bismuth with metallic luster, high specific gravity and melting point, hexagonal crystal structure and unseen fracture. These properties of mineral Bismuth are said to match well with the acceptable characteristics of Chapala as described in rasashastra text.

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