



Identification of Chapala: A Mineral Drug of Ayurveda

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Abstract

Chapala is of controversial drug in the field of Rasa Shastra having medicinal importance in Ayurvedic system of medicine. Many Rasa Shastra texts described Chapala as mineral Bismuth or mineral Selenium. In view of this, the present study was undertaken on physicochemical characterization of Chapala for its validation and authentication. Chapala is used therapeutically in the form of Bhasma for the treatment of pain, tumor, cachexia, diabetes mellitus, fever, gynecological disorders and mansural rhythm. However, raw drug identification and characterization plays a vital role for assuring the therapeutic potential of the final drug. The sample of Chapala was collected from local market and authenticated by the subject expert and analysed through properties of the mineral, following classical and physicochemical methods. The results of physical properties of Chapala were compared with the reported physical properties of mineral Bismuth and mineral Selenium. It was observed and concluded that Chapala is a mineral Bismuth with metallic luster, high specific gravity and melting point, hexagonal crystal structure and unseen fracture. All these properties of mineral Bismuth are very well match with the acceptable characteristics of Chapala as described in Ayurvedic classics.

Keywords: Chapala, Maharasa, Mineral, Bismuth, Selenium, Rasa Shastra.

Introduction

Chapala is one of the controversial drug to the field of Rasa Shastra and found in many ancient Rasa literature. Bismuth or Selenium is considered as metallic essence of this controversial mineral. Bismuth or Selenium ores with oxides and sulphides may be considered as Chapala. Due to many controversies and number of opinions regarding the physical and chemical characters of the said mineral Chapala in Rasa literature, the conclusion could not be made about specific mineral those can be analysed to validate the mineral through its ancient features to be declared as authentic and standard Chapala. Affording all efforts, analytical study of Chapala could not become possible due to unavailability of genuine sample as per classical texts. It is hoped that the literature study done in this regard in the current research work will enlighten the researchers to explain the real, genuine Chapala as per the features described in ancient texts and facilitate further research¹. The present study was therefore undertaken to establish the authenticity of the genuine Chapala through its physicochemical analysis.

Materials And Methods

Test samples of Chapala were collected from the local market of Varanasi, U.P. and authenticated by the subject expert. The mineral was subjected for the study of physical properties and validated for the acceptability of genuine sample by adopting different methods.

The identification and physical verification of Chapala was done according to Grahya Lakshana (acceptable properties) reported in Ayurvedic classics¹. The analysis of the physical properties of Chapala was carried out as per the mineralogical descriptions mentioned in Ayurvedic Pharmacopoeia of India².

Results

The collected mineral Chapala was identified and verified as per Grahya Lakshana¹ reported in Ayurvedic classics. Observations are shown in Table-1.

Table-1: Grahya Lakshana (acceptable properties) of Chapala as per Ayurvedic classics.

S. No.	Grahya Lakshana (Acceptable Preoperties)	Physical properties	Observations
1	Shadasra	Six surfaces/hexagonal	+
2	Shatikachaya	Resamble Sphatica	+
3	Snigdha	Smooth in touch	+
4	Guru	Heavy	+

The physical characterisation of Chapala was carried out as per method mentioned in Ayurvedic Pharmacopoeia of India. The results of the mineralogical description of mineral Chapala has been shown in Table-2, Fig-1 along with reported physical properties of mineral Bismuth³ and

Table-2: The results of physical properties of Chapala in comparison with reported physical properties for Bismuth mineral and mineral Selenium.

S. No.	Physical properties	Observations for Chapala	Reported for Bismuth mineral	Reported for Selenium mineral
1	Physical state	Solid	Solid	Solid
2	Melting point	271°C	271.3°C	221°C
3	Nature of crystal	Massive	Massive	Granular
4	Crystal structure	Hexagonal	Hexagonal	Trigonal
5	Crystal form	Opaque	Opaque	----
6	Color	Silver	Silver	Grayish black, Reddish gray, Red
7	Hardness	2.5	2.0-2.5	2.0
8	Fracture	Hackly to unseen	Hackly to unseen	Flexible
9	Cleavage	Prismatic	Prismatic	Good
10	Transparency	Opaque	Opaque	Opaque
11	Luster	Metallic	Metallic	Metallic
12	Conductivity	Good conductor	Good conductor	Good conductor
13	Magnetism	Magnetic	Magnetic	Magnetic
14	Specific Gravity	9.7-9.8	9.79	4.81
15	Streak	Silver white	Silver white	Red
16	Fizz test	Negative	----	----
17	Heated in open tube	Burns with blue flame	----	----

mineral Selenium^{4,5,6}.

Discussion

The present study was conducted on Chapala, collected from local market. The study was aimed to focus the mineralogical characterization of Chapala according to Grahya Lakshana as explained in Ayurvedic literature as well as the method mentioned in Ayurvedic Pharmacopoeia of India. In India, Chapala is found near the mines of lead, tin and chalcopryrite. It is distributed mainly in Kolar District of Karnataka and Udaipur District of Rajasthan. Generally it occurs in free state in nature often as oxide and sulphide ore⁷. Chapala is used therapeutically for the treatment of tumor (Gulma nashaka), pain (Shoola nashaka), cachexia (sosha nashaka), diabetes millitus (Pramcha nashaka), fever (Jwara nashaka), gynaecological disorders (Sweta pradara) and mensural rhythm (Rakta pradara)¹.

Chapala is one of the drug classified under category of Maharasha⁸. In Rasa Kamdhenu, six types of Chapala are described like Swarna (golden Chapala), Tamra (copper Chapala), Tara (silver chapala, Nag (lead Chapala), Vanga (tin Chapala and Tikshna (iron Chapala). However,

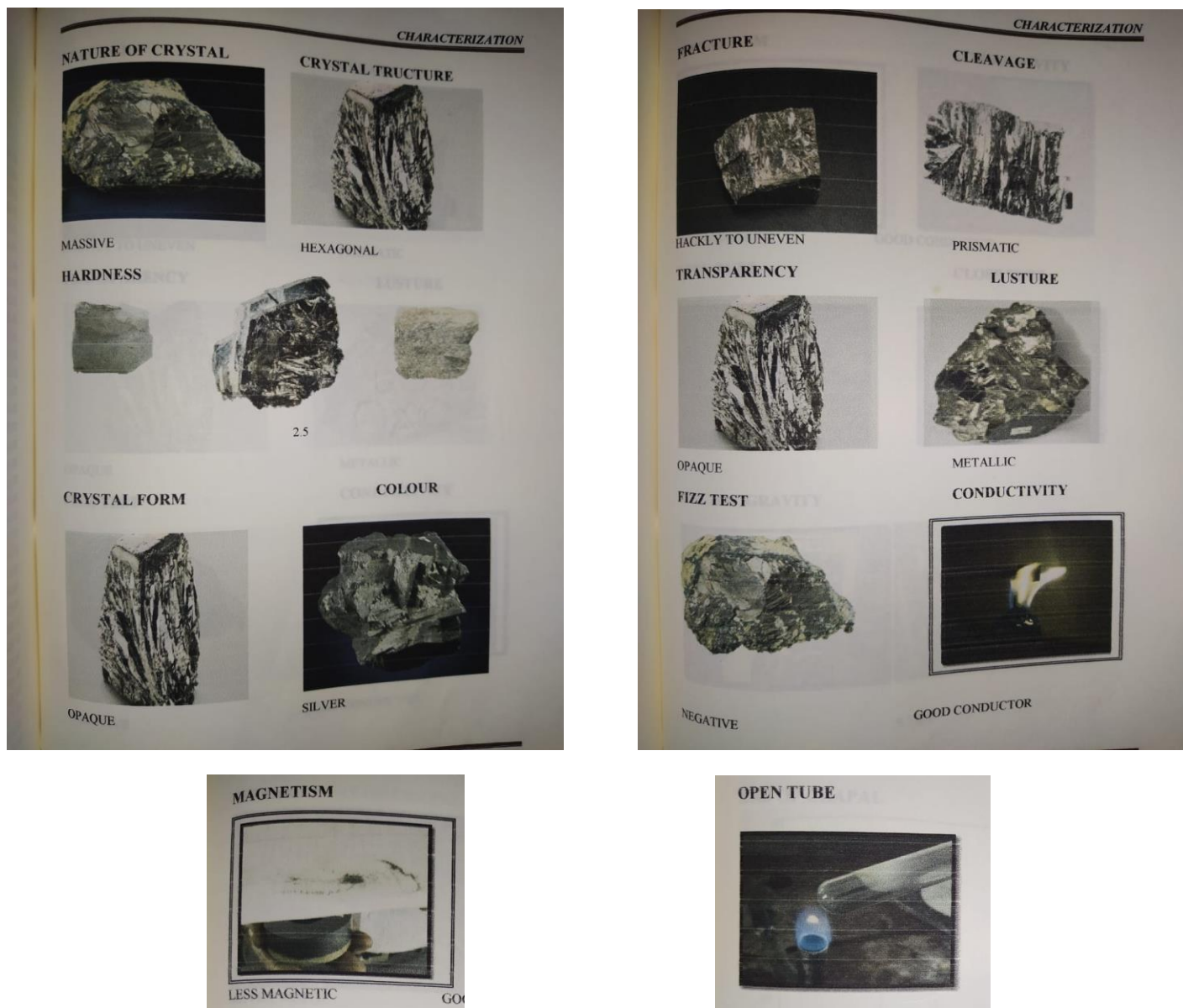


Figure-1: Test conducted for physical properties verification of Chapala

S, Fe, Cu and As elements are present in trace amount in Chapala and this classification is due to the color change is based on presence of trace elements in different variety of Chapala⁹.

The physical properties of minerals are directly related to their classical and structural characteristics. The most useful physical properties for identifying the minerals are color, luster, streak, hardness, melting point, cleavage, fracture and crystal structure. Some of the other properties such as magnetism, specific gravity transparency and taste are helpful in identifying certain minerals¹⁰. The most of the physical properties verified in this study are very well match with the reported physical properties of mineral Bismuth³, Table-2. The properties mentioned as Grahya Lakshana in classical text such as Shadasra, Sphatikachaya, Snigdha and Guru (Table-1) are very well match with the physical properties of mineral Bismuth. Many ancient Rasa Shastra texts mentioned Chapala as controversial drug of mineral Bismuth or mineral Selenium. In view of this controversy, a comparison of reported physical properties of mineral Bismuth³ and mineral Selenium^{4,5,6} were compared (Table-2). The properties of mineral Bismuth very well match with Chapala, whereas mineral Selenium possess different physical properties. Selenium showed low specific gravity (4.81) whereas specific gravity of Chapala (9.7-9.8) is very high and tallies with mineral Bismuth (9.7) as

well as the melting point of Selenium is also low (221°C) as compared to Chapala (271.3°C) and Bismuth (271.3°C). All these data supported Chapala to be as mineral Bismuth.

Following the standards of classical as well as contemporary reference, the present study confirm the authenticity of Chapala to be as Bismuth mineral. However, Chapala is used therapeutically in the form of Bhasma (incinerated ash) after the process of Shodhana (purification) with Triphala Kwatha¹¹. The particle size of Bhasma reduced significantly, considered as nanomedicine which may facilitate absorption of the drug into body system¹².

Conclusion

The acceptable properties of every metals and minerals has been mentioned in Ayurveda. The analytical standards of Chapala are not reported till date. Following the classical and contemporary knowledge, and attempt has been made to evaluate and validate the genuine Chapala by comparing the reported physical properties of mineral Bismuth and mineral Selenium and it was concluded that genuine Chapala is Bismuth mineral. The present study may be helpful in preparing genuine Chapala Bhasma as an active drug.

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