

BASIC PRINCIPLES OF RASASHASTRA – THE INDIAN PHARMACEUTICS OF HERBO-MINERAL PREPARATIONS

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ABSTRACT :

Basic principles are the fundamental concepts which have been repeatedly tested in various ways and are essential to understand related science. Every science has its own fundamental principles. Rasashastra, a branch of Ayurveda is considered as Indian pharmaceutics of herbo-mineral preparations. The principles associated with foundation and developments of Rasashastra are not clearly indicated and are scattered in various ancient classical texts. Therefore an attempt has been made to review of these fundamental principles in systemic and explanatory way. Therefore in present work an attempt has been made to make a comprehensive review of basic principles of Rasashastra and to elucidate their distinguishing features. *Lohavada* and *Dehavada*; eighteen processing methods of mercury, terminology in Rasashastra, instruments, crucibles, blowers and pit for incineration of metals/minerals, purification, incineration, *Amritikarana*, test for incinerated materials and levigation are the eight basic principles of Rasashastra. Complete understanding of these concepts with view of both Ayurvedic and contemporary science is the key for research and development in Rasashastra.

Key words: Rasashastra, Basic principles, Indian alchemy, Ayurvedic pharmaceutics

INTRODUCTION: Medicine is the backbone of nearly all medical sciences excluding some therapies such as physiotherapy, acupressure, acupuncture etc. Discovery of various medicines is a long history and result of dedicated efforts made by clever researchers. It is understood that these discoveries were made based on experience, numerous experiments, keen observations, repeated evaluation of findings and best logical interpretations of all of these. Such researches have been resulted in establishing various principles which later created the basis of particular medical sciences. Rasashastra, a branch of

Ayurveda is one of such evolved branch which is today can be considered as Indian pharmaceutics of herbo-mineral preparations. Literally, “*Rasa*” means mercury and “*Shashtra*” means science, hence initially Rasashastra is considered as science of mercury. The available literature of Rasashastra strongly indicates that mercury is the basic reason for origination of this science although, therapeutic utilization of metallic-mineral substances though various processing methods for treating numerous diseases is the core subject of Rasashastra.

Basic principles are those facts which have been repeatedly tested in

various ways and are essential to understand related science. It is clear that every science has its own basic principles. Available literature of Rasashastra has few fundamental concepts which are associated with foundation and development of this pharmaco-therapeutic science. The description of these concepts is not very clear and scattered in various ancient classical texts. It is need of hour to make a review of these fundamental principles in systemic and explanatory way. Therefore in present work an attempt has been made to make a comprehensive review of basic principles of Rasashastra and to elucidate their distinguishing features. Available classical texts have been studied basic principles has been collected from texts of *Rasashastra* such as *Rasendramangala* (8th century AD) *Rasendracudamani* (12th century AD), *Anandakanda* (12th century AD), *Rasaratnasamuchchaya* (13th century AD), *Rasendrachintamani* (13th century AD), *Rasendrasarasamgraha* (14th century AD), *Rasakamadhenu* (17th century AD) and *Rasatarangini* (20th century AD) etc. These basic principles have been interpreted according to their rationality, importance and application in view of current scenario.

OBSERVATION: The critical review of classical texts of Rasashastra showed that following concepts are the basic principles of Rasashastra.

1. Concept of Lohavada and Dehavada: Conversion of low precise metals into precious metals such as gold by using specifically processed mercury is known as *Lohavada*. Utilization of such potent mercury for gaining healthy and long life is termed as *Dehavada*. Rasashastra was originated based on this concept of achieving healthy long life by means of processed mercury which can convert

lower metals into gold. According to ancient classical texts both *Dehavada* and *Lohavada* were in existence till 13th century AD, but this science was too secrete and known to very few seers. Today, many references are available related with conversion of copper and lead into silver and gold but the exact knowledge to achieve successes is lost in the timeline.

2. Concept of Parada Ashtadasha Sanskara (Eighteen processing methods of mercury): There are 18 processing methods of mercury which aimed to remove blemishes and to make mercury such potent that it can be used to achieve the purpose of *Dehavada* and *Lohavada*. Among the 18 processing methods, first five are narrated for removing blemishes from mercury; next three are mentioned for increasing potency of mercury; next 8 methods are related with initiating transformation power in mercury to convert any metal into gold; the 17th processing method is testing of transformation power of mercury and the last one is the administration of mercury in human beings.¹

3. Concept of Paribhasha (terminology in Rasashastra): A statement of exact meaning of a word or phrase etc is known as *Paribhasha* (technical term).² There are 78 different terms mentioned in *Rasaratnasamuchchaya*.³ The words which are cryptic and ambiguous are better understood with the help of *Paribhasha*. The study of *Paribhasha* engenders of better comprehension about the science Rasashastra.

4. Concept of Yantra, Musha, Koshti & Puta (instruments, crucibles, blowers and pit for incineration of metals/minerals): Ancient seers of Rasashastra have invented various

instruments, crucibles, blowers and pit for incineration of metals/minerals. Acharya Somadev, author of Rasaratnasamuchchaya have narrated 31 instruments, 17 types of crucible, 4 types of blower and 10 types of pit in 9th and 10th chapter of his treatise. This concept provides guideline for requirement of various apparatus in pharmacy for processing of mercury, metals, minerals and herbal drugs. Apparatus is one of basic requirement for medicine preparation and hence to understand Rasashastra and for research and development in Rasashastra, knowledge of all these apparatus is necessary.

5. Concept of Shodhana (purification):
In *Rasashastra* generally the metals/minerals and some time few drugs of poisonous nature are found used which are likely to contain some toxic effect also. Hence with a view to remove or minimize their toxicity and to make them suitable for further process a number of purification procedures have been found evolved which is known as *Shodhana*.^{4,5} Here it should be noted that Ayurvedic purification does not mean making metal 100% in its original elemental form, in fact this procedure is related with impregnation of organic molecules in inorganic substances and increasing their bio-accessibility as well as reducing unwanted effects. The metallic preparations are used in the form of *Bhasma* (incinerated powder) and *Shodhana* is first and most important step before preparing their *Bhasma*. *Shodhana* of metals is divided in two steps viz *Samanya Shodhana* (general purification) and *Vishesha Shodhana* (special purification). *Samanya Shodhana* is mostly performed by heating the metal up to red hot stage or up to complete melting then quenching for either three or

seven times in each liquid media viz *Til Taila* (sesame oil), *Takra* (clarified butter), *Gomutra* (cow urine), *Kanji* (sour gruel) and *Kulattha Kwatha* (decoction of *Dolichos biflorus Linn*) respectively.⁶ However *Samanya Shodhana* is preferred only for metals and not for minerals and poisonous herbs. *Vishesha Shodhana* involves similar procedure of heating or quenching but the liquid media is different for different metals.

6. Concept of Marana (incineration):
The metals and minerals are not bio-assimilable in their natural forms. They needed to be converted into such fine form which can be easily assimilable in human body, able to cure various illnesses and did not cause any harmful effect. To achieve this purpose, concept of *Marana* (incineration) was discovered by ancient seers of Rasashastra. The process of making the metals/minerals into a fine powder by applying required quantum of heat is known as *Marana*.⁷ In brief, *Marana* means conversion of metal/mineral into fine nano particles which herbo-mineral, organo-metallic nature and therapeutic potency. In classical texts various methods incineration are mentioned for every metal. These methods can be divided into some categories based on the principle procedure such as incinerated metal prepared after *Jarana* (open pan frying) process, prepared from *Pishti* (amalgam), prepared by *Lepa* (application of layer over metal) method and prepared after open pan frying process followed by *Bhavana* (levigation) and *Puta* (incineration cycles) etc. Many times ancient seers of Rasashastra utilized more than one principle procedures. Detail understanding of incinerated preparation of any metal by a principle process helps to

understand preparative procedure of other metals.

7. Concept of Amritikarana (annihilating harmful properties from incinerated metals/minerals): *Amritikarana* is an important procedure found described in the context of *Marana* process. It is done to remove the remaining bad effects of incinerated metal/mineral which are likely to remain even after *Marana* process.⁸ It is not essentially required for all the incinerated metals/minerals but indicated for Mica, copper and copper containing preparations to make them suitable for therapeutic use.

8. Concept of Bhasma Pariksha (test for incinerated materials): It is well understood from classical literature that the ancient scholars of Rasashastra were well aware of improperly processed and incompletely prepared incinerated preparations. Therefore they have advised to take various tests to confirm complete formation of product. These tests are known as *Bhasma Pariksha*. Few important tests have been discussed here. A specific colour is mentioned for each *Bhasma*. Alteration in specific colour suggests that *Bhasma* is not prepared properly because a particular metallic compound is formed during *Bhasma* preparation and every chemical compound possesses specific colour. *Bhasma* must be *Nischandra* (lusterless) before After proper incineration, luster of metal should not remain if luster is still present, it indicates further incineration.⁹ *Varitara* test, applied to study lightness and fineness of *Bhasma*, is floating character of *Bhasma* on stagnant water surface.¹⁰ This test is based on law of surface tension. *Unama Test* is further assessment of *Varitara* test. A grain of rice is to be kept carefully on the layer of floated *Bhasma*. Observe whether grain

floats or sinks. If grain remains as it is on layer, then *Bhasma* can be considered as excellent (properly prepared). *Rekhapurnata* test means *Bhasma* should be so fine that it can fill furrows of finger tips. A little amount of *Bhasma* is rubbed in between index finger and thumb to observe whether particles can fill furrows of finger tips. This test is applied to study fineness of *Bhasma*. *Bhasma* particles should be of minimum size for easy absorption and assimilation in the body.¹¹ *Apunarbhava* means incapability to regain original metallic form. For this test, *Bhasma* is mixed with equal quantity of *Mitra Panchaka* (seeds of *Abrus precatorius*, honey, ghee, borax and jaggery) and it is sealed in *Sarava Samputa* (earthen pots), thereafter, similar grade of heat used for preparation of particular *Bhasma* is applied and on self cooling product is observed.¹² Lustrous particles in it show presence of free metal, which is indicative of improper incineration. *Niruttha* is to test inability to regain metallic form of metallic *Bhasmas*. In this test, *Bhasma* is mixed with a fixed weight of silver leaf, kept in earthen pots and similar grade of heat is applied and after self cooling, weight of silver is taken. Increase in weight of silver leaf indicates improperly prepared *Bhasma*.¹³

9. Concept of Bhavana (levigation): *Bhavana* is a process in which the material is completely submerged with the liquid media (herbal juice, decoction etc.) and triturated till complete absorption of liquid into the powder.¹⁴ *Bhavana* is an important procedure in *Marana* of metals. It is well understood that to facilitate *Bhavana*, metal should be either in amalgam form or in powder form. Therefore *Jarana* (frying in open pan) procedure is advised in the *Marana* methods of metals which utilize

herbal media for *Bhavana*. Depending upon different references available in texts, the *Bhavana* process can be carried out by adopting these two methods.^{15,16} Lavigation method in which the material is mixed with liquid media and ground till the whole material becomes like dough.¹⁷ The material is mixed with particular liquid media and ground continuously for the specific period. Soaking method in which the duration of whole process is not indicated, then liquid media is to be added to the material and whole recipe should be left under sunrays during day time and as it is in vessel during night time.¹⁸ Quantity of *Bhavana Dravya* (amount of liquid media) should be taken either as much as that the powdered drugs becomes completely wet,¹⁹ the material can get completely immersed,²⁰ the whole recipe can be made into dough, or the weight of *Bhavana Dravya* should be equal to the amount of material to be levigated.²¹ *Kwatha/Swarasa* or any other *Dravya* used for *Bhavana* should be equal or similar in properties and potency of *Bhavya Dravya*. It is the basic relation between the particular the particular media and specific material.²²

DISCUSSION: It is a well known fact that every science has gone through changes and modifications done by researchers in related field. Advancement in technologies, new researches according to contemporary needs can be considered as basis of changes and modifications in any branch of science. Rasashastra is not an exception to this reality. Achieving salvation was the main aim of ancient Indians and maintaining health, longevity of life for continuous meditation was the key requirement. Therefore prime importance was given to concept of *Lohavada* and *Dehavada* from 8th to 13th

century AD. It is believable that few seers achieved success in conversion of copper and lead into gold by using processed mercury. However the science of mercury processing was kept highly secret and rarely passed to next generation which resulted in complete vanishing of such miraculous knowledge. Great facility and financial support is needed for research in the field of *Lohavada* and *Dehavada*. Similar situation is applicable to 18 processing methods of mercury. Today these methods are considered as tedious, time consuming and expensive. First eight processing methods are possible to perform and are used upto some extent. Therefore the knowledge of atleast first eight processing methods is essential for understanding of Rasashastra.

Using a specific term for a particular process, for a group or for defining a special concept is one of the best way to make a science precise as well as systematic. The *Paribhasha* i.e. terminology utilized in Rasashastra are very well explained by Acharya Vagbhat in 8th chapter of his treatise *Rasaratnasamuchchaya*. The classical description of instruments, crucibles, blowers and pit for incineration of metals/minerals is with the view of ancient knowledge availability of materials. Much advancement have been done in this field in recent time and this have included in Ayurvedic drug manufacturing such as use of distillation apparatus in place of *Tiryagapatana Yantra*, cast iron crucible at place of *Vajramusha*, electric muffle furnace and use of liquid petroleum gas replaced *Koshthi* and *Puta* etc. Such modifications are acceptable and need of hour for large scale manufacturing, minimizing labor cost, time and for large scale manufacturing of medicines.

It is interesting to mention that few concept of Rasashastra such as concept of purification, concept of incineration, concept of *Amritikarana*, concept of test for incinerated materials and concept of *Bhavana* (levigation) holds their unique value and need to be strictly followed as per classical guideline to achieve desired results mentioned in Ayurvedic texts. The available literature of Rasashastra is source of vast information for discovering new formulations as there are many methods narrated for purification, incineration, levigation etc and change in single drug/media in any of these processes may alter the therapeutic potential of final product. Although, it is clear that the knowledge of basic principles of Rasashastra is essential for understanding, research and development of this pharmaco-therapeutic science. In present work the scattered basic principles have been reviewed in brief and this information will prove obliging for general understanding of Rasashastra.

CONCLUSIONS: There are eight basic principles of Rasashastra which includes *Lohavada* and *Dehavada*; eighteen processing methods of mercury, terminology in Rasashastra, instruments, crucibles, blowers and pit for incineration of metals/minerals, purification, incineration, *Amritikarana*, test for incinerated materials and levigation. Keen understanding of these concepts with view of both Ayurvedic and contemporary science is the key to understand as well as for research and development in Rasashastra.

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