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Brief Review of literature on *Puti Lohas*

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ABSTRACT

Rasashastra is a science which deals with the pharmaceuticals of medicines out of mercury, minerals, metals, gem stones and animal products etc. *Loha* and *Dhatu* are considered as one and the same. *Puti Lohas* are those drugs which emit bad smell while they are melting. Many references of *Puti Lohas* are available in Ayurvedic classics since *Vedakala* to modern texts. *Puti Lohas* cannot be degraded since they are having their own identity in mineralogy and clinical practice of Ayurveda.

Key words: *Putiloha, Dhatu, Shodana, Jarana, Marana.*

INTRODUCTION

The Sanskrit word “*Dhatu*” comes from *Veda* “*Dha*” meaning to support. There are 7 basic *Dhatu*s (tissues) which support the living body. The Sanskrit word “*Loha*” derived from a root “*luha*” meaning to pull. Thus ores, from which metals are extracted were known as ‘*Loha*’.

In context of *Rasashastra* the word *Dhatu* denotes a metal, *Loha* and *Dhatu* considered as one and the same in ancient scriptures of Ayurveda. Almost all metals are derived from ores which means concentrations of appropriate minerals accessibly situated at or near the earth’s surface. The word ‘*Puti*’ means bad, obnoxious or dirty. The metals mentioned in this group are supposed to emit obnoxious smell, while they are melting, so these are called as *Putilohas*. There are 3 *Putilohas* viz, *Naga, Vanga, Yashada*.

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HISTORICAL BACKGROUND^[1]

In Indian history, mercury was the first metal used for medicinal purpose, numerous mentions have been made about various metals and minerals since *Vedic* period.

Vedic Periods

1. In *Rigveda* mention of Gold has been made denoting its usage for Ornaments and the Gold smith was called as *Karmar* in those days.
2. In *Yajurveda* there are many references of Gold, Silver, Copper, Lead, Tin, and Iron are present.
3. In *Atharvaveda* there are many references of metals present they called *Swarna* as *Harita, Chadi* as *Rajata, Loha* as *Shyamamaya Loha, Tamra* as *Lohithamaya Loha*.
4. Various references about metals are found in ancient scriptures like *Ramayana, Mahabharata, Agnipurana* and *Vishnu Dharmottara Purana*.
5. In *Yagnavalka Smriti*^[2] also explain the 6 *dhatu*s and he explain the loss of the individual metals when heating on fire (*Agni*).
6. In *Manu Smriti* also explain 8 *Dhatu*s they are *Swarna, Rajata, Tamra, Loha, Kansya, Riti, Naga, and Vanga*. In that explanation about *Shodana* of *Dhatu*s with the *Jala, Ksara, and Amla*.

Samhita Period

After knowing about the medicinal importance of the *Dhatus* they have explained in our *Chikitsa Granthas*. In *Charaka Samhita*^[3] also explain the 8 *Dhatus*, *Swarna*, *Rajata*, *Tamra*, *Trapu*, *Pittalam*, *Kansya*, *Sisa* and *Ayas* (iron). In *Susruta Samhita*^[4] also explain about 6 *Dhatus*, *Swarna*, *Rajata*, *Tamra*, *Krishna Loha*, *Trapu*, *Sisam* they are used as *Aushadha*, *Sastra* and *Upakarana*. In *Astanga Sangraha*^[5] the *Marana* of metals have been explained, he also explain *Swarna*, *Rajata*, *Tamra*, *Kansya*, *Trapu*, *Sisa*, *Krishna Loha*.

Period of Rasa Shastra

Almost all the *Rasa Shastra* texts explain the *Dhatus*. In *Rasarnava*^[6] explain 6 *Dhatus* *Swarna*, *Rajata*, *Tamra*, *Tiksna Loha*, *Vanga* and *Sisa* and he explain types of each *Dhatu*. In *Rasahrudaya Tantra*,^[7] *Dhatus* are classified into 3 groups, *Sara Loha*, *Satva Loha* and *Puti Loha*. In *Rasaratna Samucchaya*^[8] also classified *Dhatus* into 3 groups, *Shudda Loha*, *Puti Loha*, and *Mishra Lohas*. In *Rasa Tarangini* also explain 7 *Dhatus*. *Yogaratanakara* also explain 7 *Dhatus* in that he added *Parada*. In *Rasamrutam* also explain about *Lohas* in 2nd chapter and below an attempt is made to describe the name, synonyms, types, *Grahya Swaroopa*, methods of *Shodhana*, *Jarana*, *Marana*, *Guna*, *Karma*, *Matra*, *Anupana* and *Yoga* in brief tabular form of *Puti Lohas*.

1. Naga (Lead)

Character	Details
Name	Sanskrit - <i>Naga</i> , English - Lead, Hindi - <i>Sisa</i> , Latin - Plumbum, Symbol - Pb
Synonyms ^[9]	<i>Sisa</i> , <i>Sisaka</i> , <i>Naga</i> , <i>Nagaka</i> , <i>Bhujanga</i> , <i>Ashivisha</i> , <i>Kuveduka</i> , <i>Kuranga</i> , <i>Sarpa</i> , <i>Sindurakarana</i> , <i>Vabra</i> , <i>Yogesta</i> .
Chemical Name	Plumbum (Pb)

<i>Varga</i>	<i>Dhatu (Putiloha)</i>
Types ^[10]	<i>Kumara</i> and <i>Shabala/Shamala</i>
<i>Grahya Swaroopam</i> ^[11]	Lead is a bluish grey, heavy metal, the freshly cut surface shows a bright metallic luster, which is however quickly lost on exposure to air due to oxidization, it is soft may be scratched with the finger nail and makes a black streak on paper, when heated it emits a foul odour.
<i>Agrahya Swaroopam</i> ^[12]	Opposite to above said qualities.
Specific Gravity	7
Hardness	1.5
Melting Point	327.5°C
<i>Shodhana</i>	<i>Samanya Shodana</i> : ^[13] <i>Naga</i> is to be melted and poured in a <i>Pithara Yantra</i> containing <i>Tila Taila</i> , <i>Takra</i> , <i>Gomutra</i> , <i>Kanji</i> and <i>Kulattha Kwatha</i> for 7 times each. <i>Vishesha Shodana</i> : 1. Lead is heated in an iron vessel with the fuel of <i>Khadhira</i> wood, on melting it is quickly poured into the <i>Triphala Kwatha</i> , <i>Kumari Swarasa</i> or <i>Karavira Swarasa</i> for 7 times, the lead gets purified. ^[14] 2. Melted Lead is poured into <i>Churnodaka</i> for 7 times, the lead gets purified. ^[15] 3. Melted Lead is poured into <i>Nirgundi Swarasa</i> containing <i>Haridra Churna</i> for 3 times to purify lead specifically. ^[16]

<i>Jarana</i> ^[17]	Pure lead is melted over fire in an iron pan and added ¼ th part mercury then <i>Ahiphena Churna</i> (<i>Papaver Somniferum</i> Linn.) little by little is added and go on rubbing with iron ladle, when lead converts into powder form, it should be collected at the center of an iron pan and strong heating may be applied for few hours and allowed for <i>Swanga Sheeta</i> (self cooling).
<i>Marana</i> ^[18]	Equal quantity of <i>Manashila</i> powder is added to <i>Jarita Naga</i> and triturated it with <i>Atarusa Swarasa</i> (<i>Vasa Swarasa</i>) and apply <i>Laghu Puta</i> by <i>Putra</i> system, from 2 nd <i>Putra</i> onwards add 1/4 th part of <i>Manashila</i> and repeat the procedure for 7 times, by this method lead certainly converts into <i>Bhasma</i> form.
<i>Guna</i> ^[19]	<i>Rasa</i> - Madhura, Tikta, Katu, <i>Guna</i> - Guru, Snigdha, Sara. <i>Virya</i> - Usna <i>Karma</i> - Lekhana, Dipana, Vatanasana, Balya, Pramehagna, Sukrala, Vajikarana, Vrusya, Krimigna, Chaksusya, Ayusya, Kanti Vardaka.
<i>Vyadhi Prabhava</i> ^[20]	<i>Asrigdara, Meha, Arsas, Vataroga, Vyana, Gulma, Grahani, Atisara, Krimi, Kamala, Kusta, Visa, Swasa, Trusna, Medhoroga, Pandu, Amavata</i> etc.
<i>Matra</i> ^[21]	¼ - 1 Ratti (30-120mg)
<i>Anupana</i> ^[22]	<i>Madhu</i>
<i>Yogas</i> ^[23]	<i>Trilokyacintamani Rasa, Manikya Rasa, Trivanga Bhasma,</i>

<i>Antrasantaka Rasa, Kandarpasundara Rasa, Kalanala Rasa, Jwarari Rasa, Nrupativallaba Rasa, Yogeswara Rasa, Sucika Barana Rasa.</i>

2. Vanga (Tin)

Character	Details
Names	Sanskrit - <i>Vanga</i> , English - Tin, Hindi - <i>Ranga</i>
Latin Name and Symbol	Stannum (Sn)
Synonyms ^[24]	<i>Vanga, Vangaka, Ranga, Rangaka, SukraLoha, Kurupya, Trapu, Trapusa,</i>
<i>Varga</i>	<i>Dhatu</i>
Types ^[25]	<i>Khuraka</i> (best) and <i>Misraka</i>
<i>Grahya Swaroopa</i> ^[26]	White, soft, smooth, heavy, quick melting and without any sound.
<i>Agrahya Swaroopa</i> ^[27]	Blackish white, hard, not melt easily and associated with other metallic impurities.
Specific Gravity ^[28]	7.3
Hardness ^[29]	6.7
Melting Point ^[30]	232 ⁰ C
<i>Shodhana</i>	<i>Samanya Shodhana</i> - <i>Vanga</i> is to be melted and poured in a <i>Pithara Yantra</i> containing <i>Tila Taila, Takra, Gomutra, Kanji,</i> and <i>Kulattha Kwatha</i> for 7 times each.

	<i>Vishesha Shodhana</i> ^[31] - Melted <i>Vanga</i> is poured in the pot containing <i>Nirgundi Swarasa</i> and <i>Haridra Churna</i> for 3 times.
<i>Jarana</i> ^[32]	Pure <i>Vanga</i> is kept in an Iron Pan and heated, while melting, powder of <i>Apamarga</i> 1/4 th part is sprinkled over it little by little rubbing with an Iron ladle, till it becomes powder form completely.
<i>Marana</i> ^[33]	<i>Jarita Vanga</i> powder is triturated with <i>Kumari Swarasa</i> or <i>Satavari Swarasa</i> or milk cream and prepare its <i>Chakrikas</i> , dry them and close in a <i>Sarava Samputa</i> and apply <i>Ardha Gajaputa</i> heat such 7 <i>Putas</i> certainly convert <i>Vanga</i> into <i>Bhasma</i> form.
<i>Guna</i> ^[34]	<i>Rasa</i> - <i>Tikta, Katu, Amla, Kashaya</i> and <i>Kincith Lavana</i> . <i>Guna</i> - <i>Ruksa, Laghu, Sara, Usna, Teekna</i> . <i>Virya</i> - <i>Usna. Karma</i> - <i>Balya, Dipana, Pacana, Medha, Vrishya, Kaphapittahara, Ishat Vataprakopa</i> .
<i>Vyadhi Prabhava</i> ^[35]	<i>Kasa, Swasa, Kapha Roga, Medho Roga, Prameha, Ksaya, Krimi, Pandu, Ratrisweda, Ojomeha, Agnimandya, Vrana, Aruci</i> .
<i>Matra</i> ^[36]	1 - 2 <i>Ratti</i>
<i>Anupana</i> ^[37]	<i>Honey, Ghee, Milk, Guduchi Swarasa, Haridra Rasa</i> .
<i>Yogas</i> ^[38]	<i>Trivanga Bhasma, Swarna Vanga, Nityananda Rasa, Anetrakya Rasa, Indu Vati, Lakshmivilasa Rasa, Mahashanka Vati</i> .

3. *Yasada* (Zinc)

Character	Details
Name ^[39]	Sanskrit - <i>Yasada</i> , English - Zinc, Hindi - <i>Jasta</i>
Latin Name and Symbol	Zincum (Zn)
Synonyms ^[40]	<i>Yasada, Jasada, Ritihetu, Kharparaja, Ranga Sankara</i> .
<i>Varga</i>	<i>Dhatu (Putiloha)</i>
<i>Grahya Swaroopa</i> ^[41]	White, shiny, smooth, soft, heavy and quickly melts on fire.
<i>Agrahya Swaroopa</i> ^[42]	Hard, not melts easily and <i>Ruksa Prabham</i> .
Specific Gravity	7.15
Melting Point	419 ⁰ C
<i>Shodhana</i>	<i>Samanya Shodhana</i> - <i>Yasada</i> is to be melted and poured in a <i>Pithara Yantra</i> containing <i>Tila Taila, Takra, Gomutra, Kanji</i> and <i>Kulattha Kwatha</i> for 7 times each. <i>Vishesha Shodhana</i> ^[43] - Melted <i>Yasada</i> should be poured in <i>Choorndaka/Snuhi Ksheera/Nirgundi Swarasa</i> for 7 times, or <i>Goksheera</i> for 21 times
<i>Jarana</i> ^[44]	<i>Shodhita Yasada</i> is melted on fire, put <i>Bhanga</i> and <i>Ahipena</i> (<i>Papavar Somniferum</i> Linn.) powder on little by little and rub it carefully with an Iron ladle till <i>Yasada</i> completely converts into powder form .
<i>Marana</i> ^[45]	<i>Jarita Yasada</i> powder is sieved through cloth and subject it to <i>Kumari Swarasa Bhavana</i> then prepare its <i>Chakrikas</i> and allow them to dry then apply <i>Gajaputa</i> heat by <i>Puti</i> system, In this

	way by repeating the process 7 times <i>Yasada</i> converts into <i>Bhasma</i> form.
<i>Guna</i> ^[46]	<i>Rasa - Tikta, Kashaya, Katu. Guna - Sheeta. Virya - Sheeta Virya, Karma - Chaksusya, Buddivardaka, Shramahara, Kaphapitta Nasaka, Vata Samaka.</i>
<i>Vyadhi Prabhava</i> ^[47]	<i>Prameha, Netraroga, Pandu, Kasa, Swasa, Ratrisweda, Vrana, Vranasrava, Atyadika Rajasrava, Kampavatanasaka.</i>
<i>Matra</i> ^[48]	½ - 1 Ratti
<i>Anupana</i> ^[49]	<i>Makkhana, ghee, milk, milk cream</i>
<i>Yogas</i> ^[50]	<i>Trivanga Bhasma, Shilajatvadi Lauha, Laghuvasanta Malati Rasa, Swarnavasanta Malati Rasa, Yasadamruta, Malahara.</i>

DISCUSSION

The word 'Puti' means bad, obnoxious or dirty. The 3 metals mentioned in this group are supposed to emit obnoxious smell while they are melting, so these are called as *Puti Lohas*. The knowledge of *Puti Lohas* was present science *Veda Kala*. The *Puti Lohas* are used in our classics as Instruments and Medicines to treat the disease. *Puti Lohas* are available in different alloy forms these alloys are used in our day today life. eg: *Naga* and *Vanga* are present in alloys like Solder, Tempemetal, Pewter, Wood Metal. *Yasada* present in alloys like *Pittala* etc. Many dissertation works are done over these *Puti Lohas* to prove their effect in treating many diseases.

CONCLUSION

Hence by considering all the discussion points we can conclude that *Naga, Vanga* and *Yasada* are called as *Puti Lohas* and they are mentioned in Indian classics since ancient days. Pharmaceutically there are many formulations prepared by *Putilohas* and shows its benefits over many diseases. Application of *Putilohas* as been proved by many thesis works, hence *puti*

lohas are having unique importance in Ayurvedic classics.

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