

CRITICS ON HINGULA

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ABSTRACT

Hingula is an eccentric drug which has a wide range of therapeutic usage in *ayurveda*. Regardless of its betterment in the management of many diseases, no research article is published till date. The main aim of this article is to review *hingula* and cinnabar which is disclosed in the classics.

KEYWORDS: *Hingula*, cinnabar.

INTRODUCTION

Rasashastra is a branch of *Ayurveda* which deals with metallo-mineral preparations aimed at achieving *Lohavada* & *Dehavada*. These preparations became acceptable due to its assimilatory property in the minute doses. There are mainly classified as *maha rasa*, *upa rasa*, *sadarana rasa*, *lohas/dhatus*, *ratnas*, *uparatnas*, *sudha varga*, *sikata varaga etc.*, There is numerous formulations which are prepared out of these classification. *Hingula* is classified under *sadarana rasa*.^[1] *Hingula* plays a very important role in *rasa Shastra*, it is used after *shodhana* for both internal and external purpose. It is the chief ore of *parada* (Mercury) and belongs to *Sadharana rasa Varga*.^[1] It has been included under both *Maharasa* and *Sadharanarasa Vargas*.^[2]

Table No 1: Showing Classification of Hingula According To Various Texts.

Sl. No	Rasagrantha	Maharasa	Uparasa	Sadharana rasa
1	RV ^[3]	+	-	-
2	RHT ^[4]	+	-	-
3	RCh ^[5]	+	+	-
4	R.Chu ^[6]	-	+	-
5	BP ^[7]	-	+	-
6	AP ^[8]	-	+	-
7	AK ^[9]	-	+	-
8	RSS ^[10]	-	+	-
9	Rasopanishath ^[11]	-	-	+
10	RJN ^[12]	-	-	+
11	RRS ^[13]	-	-	+

History: For the first time *Hingula* has been quoted while explaining the tests of gold and how it is spoiled when it comes in contact with *Hingula*. There are no references of this material either in *Vedas* or in *Samhitas*.^[14]

Hingula has been quoted for the first time in *Koutilya Artha Shastra*, in testing of Gold and its use to discolour gold.^[15] It was said to be available in “*Darada desha*” (northern part of India) in earlier days, but now it is unavailable in any parts of India.^[16]

Occurrence^[17]

Generally occurs due to the result of volcanic activity and near hot springs. Important places of occurrence are Spain, Italy, Western states of U.S.A and Mexico. Cinnabar is also prepared artificially, by combining Mercury and Sulphur. Artificial cinnabar is prepared in India in Surat and Kolkata but there is no natural source available in India

Vernacular Names^[18]

Sanskrit	–	<i>Hingula, Darada.</i>	Hindi	–	Hingula, Singaraph.
Bangali	–	Hingula.	Gujarati	–	Hingalo.
Assami	–	Janjaphar	Pharsi	–	Sangarph.
English	–	Cinnabar.	Telugu	–	Ingalikam
Kannada	–	Hingalika.	Marathi	–	Hingula

Synonyms^[19]

<i>Charmaragandhika</i>	–	Business men used to keep in a bag of wool.
<i>Darada</i>	–	It was brought from ‘ <i>Darada desha</i> ’ near Kashmir.
<i>Hamsapada</i>	–	Resembles the colour of feet of swan.

<i>Kapisheershaka</i>	–	Colour resembles the head of monkey.
<i>Mleccha</i>	–	It was imported from other countries (Greek)
<i>Rakta</i>	–	Red Colour.
<i>Rakta Kaya</i>	–	Red colour.
<i>Rasodbhava</i>	–	Source of Rasa.
<i>Ratnaragakari</i>	–	It was used as coating material in preparation of utensils.
<i>Shukatunda</i>	–	Resembles the colour of beak of Parrot.
<i>Supeethaka</i>	–	Refers to yellow colour.

Types

According to source^[20]

1. *Khanija* (Mineral) – Obtained from mines.
2. *Kritrima* (Artificial) – Prepared artificially from *Parada* and *Gandhaka* in *Mrudanga Yantra*.^[21]

According to colour and Properties^[22]

1. *Charmara* – *Shukavarna* i.e, colour of parrot
2. *Shukatunda* – Yellowish in colour.
3. *Hamsapada* – Colour is similar to *pravala* with white streaks, coloured like Hibiscus flower.

Hamsapada variety is considered to be the best and *charmara* is considered to be having least qualities.

According to another reference, *Shukatunda* and *Charmara* are considered similar and hence only two types of *Hingula* have been explained.^[23]

1. *Shukatunda*
2. *Hamsapada*

Grahya Lakshana

<i>Japakusuma Varnabha</i>	–	It resembles the colour of petals of red hibiscus flower.
<i>Peshane Sumanoharaha</i>	–	When grinded its colour becomes beautiful.
<i>Mahojvala</i>	–	Reflects in sunlight.
<i>Bharapurna</i> ^[24]	–	Heavy in weight
<i>Shveta Rekha</i>	–	Having white or silvery streaks.
<i>Pravalabha</i> ^[25]	–	Resembles <i>pravala</i> .

Shuddha Hingula lakshana^[26]: Initially it is red in colour but after *shodhana* the redness increases and looks like ripened *Bimbiphala*.

Ashuddha Hingula Sevanajanya Lakshana: *Ashuddha Hingula*, if consumed causes *andhya* (blindness), *kshainya* (weakness), *klama* (fatigue), *bhrama* (giddiness), *Moha Prameha*^[27], *Kustha* and *Klaibya*.^[28] Hence it should be only after proper *Shodhana*.

Shodana

Table no 2: Showing different methods and media for Hingula shodhana.

Sl. No	Method	Media	RT ^[29]	AP ^[30]	RRS ^[31]	R.Chu ^[32]	RJN ^[33]
1	Bhavana	Ardraka swarasa	+	+	+	+	+
2	Bhavana	Lakucha swarasa	+	+	+	-	+
3	Bhavana	Nimbu swarasa	+	-	-	+	-
4	Bhavana	Amlavarga dravya, Meshi ksheera	-	-	-	-	-
5	Swedana	1. Jayanti swarasa 2. Nimbu swarasa 3. Kanji	-	-	-	-	+

Hingulottha Parada

Hingula is the main ore of *Parada*. The *Parada* which is extracted from *Hingula* in *damaru yantra* by *Urdhwapatana* method is pure and devoid of nagadi Sapt-Kanchuka doshas^[34] and has the qualities of *Samaguna Gandhaka Jirna Parada*.^[35] It is equal to *Asta Samskarita Parada*.

Methods employed

Various methods have been employed for the extraction of *Parada* from *Hingula*.

Urdhwapatana Vidhi *Adhahpatana Vidhi*

Tiryak patana Vidhi *Nadayantra etc.*

Yantras used for the extraction of *Parada* are:

1. *Urdhwa Patana yantra*^[36]
2. *Patana yantra*.^[37]
3. *Vidhyadhara yantra*.^[38]
4. *Damaru yantra*^[39]
5. *Adhahpatana yantra*^[40]
6. *Tiryakpatana yantra*^[41]
7. *Nada yantra*^[42]

For extraction of *Parada* from *Hingula*, *Hingula* must be triturated with juices of either *Nimbu* or *Paribhadra* or *Nimba patra* for 3 hrs and dried and kept in any of the above said

yantra and sealed well. Then heated by cooling the other pot where *Parada* is condensed. Mercury is extracted and squeezed through the cloth.

Adhahpatana Vidhi^[43]

- *Hingula* is triturated with *Ardraka* or *Nimbu swarasa*, paste is applied to the inner surface of the upper pot.
- Lower pot filled with water is placed in the earth. And mouth of upper pot is placed over the mouth of the lower pot and *Sandhi Bandhana* is done and dried
- *Vanopalas* are placed over the upper pot and fire is given.
- After *swanga sheeta*, *Parada* is collected from lower pot and washed.

Tiryak Patana Vidhi: By distillation apparatus.

Urdhwa Patana Vidhi^[44]

- *Hingula* is subjected to *Mardana* with the *swarasa* of either of the following drugs for 1 day: *Paribhadra*, *Changeri* or *Jambeera nimbu*.
- The dried *Hingula* after *Mardana* is subjected to *Patana* in *Urdhwa patana yantra*. The *Parada* thus obtained will be devoid of *sapta kanchuka dosha*.
- This *Parada* is again subjected to *mardana* with 1/16th part of *Haridra churna* or with *Saindhava lavana* and *Nimbu swarasa* for 2 days.
- It is then filtered with 4 layered cloths and *Parada* is collected.

Nada yantra vidhi^[45]

Bhavita Hingula is powdered and spread uniformly over a cloth or a cotton pad. This cotton pad is then rolled gently into the form of a wick. This wick is placed over burning charcoal. A pot is placed over the wick upside down; Vapours coming out from wick stick inside the pot. *Parada* from the pot is collected.

Pharmacological & Therapeutic Properties

<i>Rasa</i>	-	<i>Tikta</i>
<i>Guna</i>	-	<i>Ushna</i>
<i>Virya</i>	-	<i>Ushna</i> ^[46]
<i>Karma</i>	-	<i>Deepana, Rasayana, Vrishya</i> ^[47] , <i>Netrya, Kanti-Bala-Buddhi vardaka</i> ^[48] , <i>Balya, Medha –AgniVardaka,</i>

Vajikarana, Hridayotsadakara^[49]

Doshagnata - *Sarva doshagna*^[47], *Kapha-Pitta hara*^[48]

Rogagnata - *Prameha, Kushta*^[46], *Pleeha roga, Jwara, Kamala, Garavisha, Amavata, Mandagni, Prameha*^[88], *Hridroga, Aruchi, Amlapitta, Hrillasa*^[49]

Dose - $\frac{1}{2}$ -1 Ratti^[50]

Anupana - *Maricha, Guda, Pippali, Guduchi swarasa, Madhu*^[51]

Preparation of Artificial Hingula

Ashuddha Parada and *Ashuddha Gandhaka* are taken in the ratio of 1:4. This mixture is kept in an iron vessel and *Swalpagni* is given, later $\frac{1}{10}$ th part of *Manashila churna* is added to it and stirred. After self-cooling, cut in to small pieces and put it in to green bottle, subjected to heating in *Valuka yantra* for 7 days. Here first day *Swalpagni* is given later *Mrudu, Madya* and *Tivragni* is given.

Parada and *Gandhaka* are taken in the ratio of 6:1, It is subjected to *Urdhvapatana Yantra*.^[52]

Parada and *Gandhaka* in the ratio of 8:42. Is taken & subjected to *paka* in *Mrudanga yantra*.^[53]

CINNABAR^[54]

Cinnabar is a beautiful bright red or brick red sulphide mineral that is sometimes known as vermilion. It is a major ore for the production of Mercury and is made of a compound called mercury sulfide (also known as mercuric sulfide), which has the chemical formula HgS. Most of the world's mercury supply is obtained from cinnabar. Historically, it has been mined as far back as early Roman times, Cinnabar contains as much as 86% Mercury.

History: It is a historical pigment, Theophrastus Greek botanist, mentions the use of cinnabar, in Greece as early as sixth century BC. It was well known to the Romans and was widely used in China since the third millenium B.C.

Occurrence: Generally occurs due to the result of volcanic activity. Also available near hot spring. Important places of occurrence are Spain, Italy, Western states of U.S.A and Mexico. Cinnabar is also prepared artificially, by combining mercury and Sulphur.

Forms of Cinnabar

- ❖ Hepatic cinnabar is an impure variety in which bituminous and earthy matter are mixed.
- ❖ Metacinnabarite is a black-coloured form of HgS which crystallizes in the cubic form.
- ❖ Synthetic cinnabar is produced by treatment of Hg (II) salts with hydrogen sulfide to precipitate black, synthetic Metacinnabarite.
- ❖ Hypercinnabar, crystallizes in the hexagonal form

Table No. 3: Showing general features of Cinnabar.

Chemical formula	Mercury(II) sulfide, HgS
Colour	Brownish-red
Crystal habit	Rhombohedral to tabular. Granular to massive
Crystal system	Hexagonal
Cleavage	Prismatic, Perfect
Fracture	Uneven to Subconchoidal
Mohs Scale Hardness	2-2.5
Luster	Adamantine to dull
Refractive index	Transparent to opaque
Streak	Scarlet
Specific gravity	8 - 8.2
Density	8.1
Solubility	3.10-26 g per 100 ml water

Medicinal Use of Cinnabar: Cinnabar helps to harmonize and strengthen the relationship between breathing and circulation. It is an effective remedy against chronic recurrent inflammatory diseases. It is a great blood healer, encourages formation of blood corpuscles and detoxifies the body, aids the immune system, helps to avoid infections.

Extraction of Mercury from Cinnabar: Mercury is extracted by heating cinnabar ore in a current of air and condensing the vapour. The equation for this extraction is:



To produce liquid (quicksilver) mercury, crushed cinnabar ore is roasted in rotary furnaces. Pure mercury separates from Sulphur in this process and easily evaporates. A condensing column is used to collect the liquid mercury.

DISCUSSION

Even though many therapeutic benefits are known researchers are stepping backward to take up single drug for studies. *Hingula*, how far it is effective as a *rasyana*, as a *jwaragna*, as a *pramehagna* etc is debatable issue. Fixing up of dose from infant to age old patients has to be

done. What was the criterion behind classifying *hingula* under *maha rasa*, *upa rasa* and *sadarana rasa* has to be discussed rationally and scientifically. Where exactly *hingula* has to be placed are to be discussed.

CONCLUSION

Hingula is one of the important drug upon which *rasa Shastra* is depended on. *Hingula* is an eccentric drug which has a wide range of therapeutic usage in *Ayurveda* apart from *loha vada*, there is wide range of opportunities to study regarding wonder drugs like *hingula*.

REFERENCES

1. Shri Vagbhatacharya. *Rasa Ratna Samucchaya*. Edited by Pandit Sri Dharmanandana sharma. 2nd Edn. Varanasi: Motilal banarasidas publication; 3rd chapter, version, 1996; 126: 55.
2. Ibid, 6th chapter, version, 45: 113.
3. Bhairavanandayogi. *Rasarnava or Rasatantram* – edited by Dr Indradev Tripathi, with *Rasachandrika Hindi commentary*. edited by Dr. Shri Krishna Dixit. 3rd ed. Varanasi: Choukhambha Samskrit Series Office; 7th Patala, Shloka, 1995; 2: 93.
4. Govinda Bhagavatpada. *Rasa Hridaya Tantram*. *Mugdavabodhini Sanskrit commentary of Chaturbhuj Mishra*. edited by Acharya Doulatram Shastri. 2nd edition. Varanasi: Choukhamba Publications, 2001; 9th Chapter, Shloka 4: 239.
5. Dundukanatha. *Rasendra Chintamani*. Translated by Siddhinandan Mishra. 1st edition. Varanasi: Chaukhamba Orientalia, 2000; 7th Chapter, Shloka 117: 107.
6. Somadeva. *Rasendra Chudamani - Hindi translation* edited by Dr. Siddhinandana Mishra. 3rd edition. Varanasi: Choukhamba Orientalia Publication, 2004; 15th chapter, Shloka 100-102: 148.
7. Bhava Mishra. *Bhava Prakasha - English translation* by Prof. K.R. Shrikantha Murthy. 1st Ed. Varanasi: Krishnadas Academy Publication; 1998; I; 6th ch, Sub ch VIII, Shloka 90-92: 345.
8. Madhava. *Ayurveda Prakasha - Hindi commentary*. edited by Shri Gulraj Sharma Mishra. Varanasi: Chaukhambha Bharati Academy Publication, 1999; 1st Ch, Shloka 426-427: 205.
9. Shastri SVR. *Anandakanda*. Tanjore: S.Gopalan Publication, 1952; 1st ch, Shloka 44–52: 5.

10. Gopalkrishna. Rasendra Sara Sangraha - English translation, edited by Dr. Ashoka. D. Satpute, 1st ed. Varanasi: Choukhambha Krishnadas Academy Publication, 2003; 1st chapter, Shloka 226: 140.
11. Sharma B. Rasopanishat. Kaleda, Ajmer: Krishna Gopala Ayurveda Bhavana, 1956; 6th ch, Shloka 3: 104.
12. Mookerjee B. Rasa Jala Nidhi - compiled in Sanskrit. with English translation. 3rd ed. Varanasi: Chaukhamba Publishers, 1998; II: 242.
13. Vagbhata. Rasaratna Samucchaya. Vigyanabodhini Hindi commentary by Dr D.A Kulkarni. New Delhi: Meharchand Lachamanadas Publications; Reprint, 2010; 3rd Chapter, Shloka, 120: 64.
14. Shri Gopal Krishna. Rasendra Sara Sangraha. English translation. Edited by Dr. Ashoka. D. Satpute. 1st Edition. Varanasi: Chaukhambha Krishnadas Academy publication, 2003; 146-147.
15. Chanakya virachitha Koutilya Arthashastra - Kannada translation by T.G. Sidapparadhya. 1st Edition. Mysore: Vishvavidyalaya, 1965; 2nd Adhikarana, 12th Chapter, 461.
16. Bhairavanandayogi. Rasarnava or Rasatantram – edited by Dr Indradev Tripathi. with Rasachandrika Hindi commentary. edited by Dr. Shri Krishna Dixit. 3rd ed. Varanasi: Choukhambha Samskrit Series Office, 1995; 7th Patala, Shloka 2: 93.
17. Vagbhata. Rasaratna Samucchaya - Edited by Pandit Dharmanandana Sharma. 2nd ed. Varanasi Motilal Banarasidas Publications, 1996; 3rd Ch, shloka 147: 60.
18. Yadavaji Trikamji Acharya. Rasamritam. English translation Edited by Dr. Damodar Joshi. 2nd Edition. Varanasi: Chaukhambha Sanskrit Bhavana publication, 2003; 26.
19. Shri Sharma sadananda. Rasa Tarangini. Hindi translation. Edited by Pandit Kashinath Shastri. 11th Edition. Reprint. Varanasi: Motilal banarasidas Publication; 2004. 9th Taranga, verses 1-2: 198.
20. Ibid, version 4: 199.
21. Ibid, 4th Taranga, verses 22-27: 49-50.
22. Acharya Shri Madhava. Ayurveda Prakasha. Edited by Gulrajsharma Mishra. Reprint. Varanasi: Chaukhambha Bharati Academy publication, 2007; 2nd chapter, version 71: 273.
23. Shri Vagbhatacharya. Rasa Ratna Samucchaya. Edited by Pandit Sri Dharmanandana Sharma, 2nd Edition. Varanasi: Motilal Banarasidas publication, 1996; 3rd chapter, version 147: 6.

24. Shri Sharma Sadananda. Rasa Tarangini. Hindi translation. Edited by Pandit Kashinath Shastri. 11th Edition reprint. Varanasi: Motilal banarasidas Publication, 2004; 9th Taranga, version 3: 199.
25. Shri Vagbhatacharya. Rasa Ratna Samucchaya. Edited by Pandit Sri Dharmanandana sharma. 2nd Edition. Varanasi: Motilal banarasidas publication, 1996; 3rd chapter, version 149: 60.
26. Ibid 3rd Chapter, shloka 149: 60.
27. Acharya Shri Madhava. Ayurveda Prakasha. Edited by Shri Gulrajsharma Mishra. Reprint. Varanasi: Chaukhambha Bharati Academy publication, 2007; 2nd chapter, version 73: 274.
28. Shankar, Rasachandamsu. Edited by Dattaram Vaidya. Translated in Kannada by Dr. A. Halasikar. Hubli: Atreya Sadana; Ganesh Pet, 1850; Purvakandha, Version 294: 78.
29. Shri Sharma sadananda. Rasa Tarangini. Hindi translation. Edited by Pandit Kashinath Shastri. 11th Edition. Reprint. Varanasi: Motilal Banarasidas Publications; 2009. 9th Taranga, shloka, 12-15: 201.
30. Madhava. Ayurveda Prakasha - Hindi commentary. edited by Shri Gulraj Sharma Mishra. 2nd ed. Varanasi: Chaukhambha Bharati Academy Publication, 2007; 2nd ch, shloka 74-75: 274.
31. Vagbhata. Rasaratna Samucchaya, Vigyanabodhini Hindi commentary by Dr.D.A Kulkarni. New Delhi: Meharchand Lachamanadas Publications; Reprint, 2010; 3rd Ch, Shloka 142-143: 69.
32. Somadeva. Rasendra Chudamani. Hindi translation by Dr.Siddhinandana Mishra. 3rd Ed. Varanasi: Choukhambha orientalia publication, 2004; 11th chapter, Version 110: 196.
33. Bhudeb Mookerjee. Rasa Jala Nidhi or Ocean of Indian Chemistry. Medicine and Alchemy. compiled in Sanskrit text with English translation. 3rd Ed. Varanasi: Chaukhambha Publishers, 1998; 3: 3rd chapter, 226.
34. Shri Sharma sadananda. Rasa Tarangini. Hindi translation. Edited by Pandit Kashinath Shastri. 11th Edition. Reprint. Varanasi: Motilal banarasidas Publication, 2004; 9th Taranga, version 5-10: 199-200.
35. Shri Vagbhatacharya. Rasa Ratna Samucchaya. Edited by Kaviraja Sri Ambikadatta Shastri. 9th Edition. Varanasi: Chaukhamba Surabharati Prakashana, 1995; 3rd Chapter, version 151: 88.
36. Sharangadhara. Sharangadhara samhita Edited by Srikanth murthy. 1st Edition. Varanasi: Chaukamba orientalia publication, 1984; 2nd Volume, 12th chapter, 159.

37. Shri Vagbhatacharya. Rasa Ratna Samucchaya. Edited by Pandit Sri Dharmanandana Sharma. 2nd Edition. Varanasi: Motilal banarasidas publication, 2006; 9th chapter, version 6-8: 135.
38. Ibid, version 24-25: 138.
39. Ibid, version 57: 142.
40. Ibid, version 9: 136.
41. Shri Vagbhatacharya. Rasa Ratna Samucchaya. Hindi translation Edited by Prof. Dattatreya Ananta Kulkarni. Reprint. New Delhi: Meharchand Lachhmandas publication, 2006; 9th chapter, version 10-12: 164.
42. Prof. Mishra Sidhinandan. Ayurvediya Rasa Shastra. 10th Edition. Varanasi: Chaukhambha Orientalia, 2000; 209.
43. Shri Vagbhatacharya. Rasa Ratna Samucchaya. Edited by Kaviraja Sri Ambikadatta Shastri. 9th Edition. Varanasi: Chaukhambha Amarabharati Prakashana, 1995; 3rd Chapter, version 154: 84.
44. Sri Sharma Sadananda. Rasa Tarangini. Edited by Kashinatha Shastri. 11th Edition. New Delhi: Motilala Banarasidas publication, 1979; 5th Chapter, version 38-42: 82.
45. Acharya Shri Madhava. Ayurveda Prakasha. Edited by Shri Gulrajsharma Mishra. Reprint. Varanasi: Chaukhambha Bharati Academy publication, 2007; 2nd chapter, version 77: 275.
46. Shri Vagbhatacharya. Rasa Ratna Samucchaya. Edited by Pandit Sri Dharmanandana Sharma. 2nd Edition. Varanasi: Motilal banarasi das, 1996; 3rd chapter, version 150: 60.
47. Shri Sharma sadananda. Rasa Tarangini. Hindi translation. Edited by Pandit Kashinath Shastri. 11th Edition. Reprint. Varanasi: Motilal banarasidasa Publication; 9th Taranga, version, 2004; 18-19: 202.
48. Dr. Jha Chandrabhushana. Ayurvediya Rasa Shastra. Reprint. Varanasi; Chaukhambha Surabharati Prakashana publication, 2006; 290.
49. Yadavaji Trikamji Acharya. Rasamritam. English translation Edited by Dr. Damodar Joshi. 2nd Edition. Varanasi: Chaukhambha Sanskrit Bhavana Publication, 2003; 26.
50. Shri Vagbhatacharya. Rasa Ratna Samucchaya. Edited by Pandit Sri Dharmanandana Sharma. 2nd Edition. Varanasi: Motilal banarasi das, 1996; 3rd chapter, version 126: 55.
51. Mahendra bhogika. Dhanvantari Nghantu. Edited by Acharya Priyavrata Sharma and Dr.Guruprasada Sharma. 4th Edition. Varanasi: Chaukhambha Orientalia; 2004. 6th varga, version, 34-35: 184.

52. Acharya Shri Madhava. Ayurveda Prakasha. Edited by Shri Gulrajsharma Mishra. Reprint. Varanasi: Chaukhambha Bharati Academe publication, 2007; 2nd chapter, verses 78-85: 275-277.
53. Shri Sharma sadananda, Rasa Tarangini. Hindi translation, Edited by Pandit Kashinath Shastri, 11th Edition. reprint. Varanasi: Motilal banarasidasa Publication, 2004; 9th Taranga, verses 5-10: 199-200.
54. <http://en.wikipedia.org/wiki/Cinnabar>