WJPMR, 2025, 11(12), 57-63

Review Article

WORLD JOURNAL OF PHARMACEUTICAL AND MEDICAL RESEARCH

www.wjpmr.com

Impact Factor: 6.842

ISSN (O): 2455-3301

ISSN (P): 3051-2557

Coden USA: WJPMBB

AYURVEDIC INSIGHT OF BHASMA IN AMAVATA

Sharma Shivani[1], Rupali[2*]

[1]Assistant Professor, Department of *Rasa Shastra* and *Bhaishajya Kalpana*, Smt. Urmila Devi Ayurvedic College of Medical Sciences, Hoshiarpur, Punjab.

[2]Assistant Professor, Department of *Rog Nidan Evam Vikriti Vigyan*, Smt. Urmila Devi Ayurvedic College of Medical Sciences, Hoshiarpur, Punjab.

***Corresponding Author: Rupali**

Assistant Professor, Department of Rog Nidan Evam Vikriti Vigyan, Smt. Urmila Devi Ayurvedic College of Medical Sciences, Hoshiarpur, Punjab.

DOI: https://doi.org/10.5281/zenodo.17746088

How to cite this Article: Sharma Shivani1, Rupali2* (2025). Ayurvedic Insight Of Bhasma In Amavata. World Journal of Pharmaceutical and Medical Research, 11(12), 57–63.

Article Received on 25/10/2025 **Article Revised on 14/11/2025** **Article Published on 01/12/2025**

ABSTRACT

Amavata, a chronic inflammatory disorder described in *Ayurveda*, closely parallels Rheumatoid Arthritis in its clinical presentation of joint pain, swelling, stiffness, and systemic features arising from the interaction of aggravated *Vata Dosha* and accumulated *Ama*. Traditional *Ayurvedic* management emphasizes *Deepana, Pachana, Vata-shamana* and *Shothahara* therapies, in which *Bhasma* preparations play a significant role. *Bhasmas*—calcined metallic and mineral formulations—possess unique physicochemical properties including *Sukshma* (nano-sized particles), *Laghu, Deepana* and *Rasayana* qualities that enhance their bioavailability, tissue penetration, and therapeutic efficacy. Contemporary analytical studies (TEM, SEM, XRD) confirm that *Abhraka, Swarna, Lauha, Tamra, Naga* and *Vanga Bhasmas* contain nanoparticles ranging from 10–100 nm, correlating with modern nanomedicine concepts. These nanoparticles exhibit anti-inflammatory, antioxidant, immunomodulatory and mitochondrial-enhancing actions, supporting their role in *Amavata* by promoting *Ama-pachana, Agni-deepana, Vata-shamana, Srotoshodhana* and tissue rejuvenation. This conceptual review integrates *Ayurvedic* principles with modern scientific findings to elucidate the pharmacodynamics, safety, and therapeutic rationale of *Bhasma* in *Amavata*, highlighting their potential as natural nanomedicines for effective management of inflammatory joint disorders.

KEYWORDS: *Amavata*, *Bhasma*, *Nanomedicine*, *Rasaushadhis*, Rheumatism.

INTRODUCTION

Amavata is a chronic, painful disorder first described by *Madhavkara* in Madhav Nidana, characterized by the simultaneous aggravation of *Vata Dosha* and accumulation of Ama (undigested metabolic toxins) in the body. Clinically, it resembles Rheumatoid Arthritis, presenting with *Sandhi Shoola*(Joint pain), *Sandhi Shotha* (Swelling), *Stambha*(Stiffness)and systemic symptoms like heaviness and fatigue.[1] The management of *Amavata* aims to eliminate *Ama*, pacify *Vata* and reduce inflammation, thereby correcting the underlying pathophysiology.

In Ayurvedic pharmaceutics, *Bhasma* preparations-calcined mineral and metallic ashes-play a significant therapeutic role in *Amavata* due to their *Deepana, Pachana, Sbhothahara* and *Vata-Kapha Shamana*actions.[2] Recent analytical studies using Transmission Electron Microscopy (TEM) and X-Ray Diffraction (XRD) have revealed that Bhasma consist of nanoparticles in the range of 10-100nm, which exhibit enhanced bioavailability, tissue penetration and target specificity.[3] These properties correlate with the modern nanomedicine and nanocarrier concepts, suggesting that Bhasma function as natural nanoparticles that can act at the cellular level.

Hence, *Bhasma* like *Abhraka Bhasma, Lauha Bhasma, Swarna Bhasma, Tamra Bhasma* etc. provide an integrative manangement of *Amavata*, bridging the wisdom of *Ayurveda* with modern nanoscience.

AIMS AND OBJECTIVES

To evaluate the role of Bhasma (Nanoparticles) in the management of *Amavata* with reference to Ayurvedic and modern perspective.

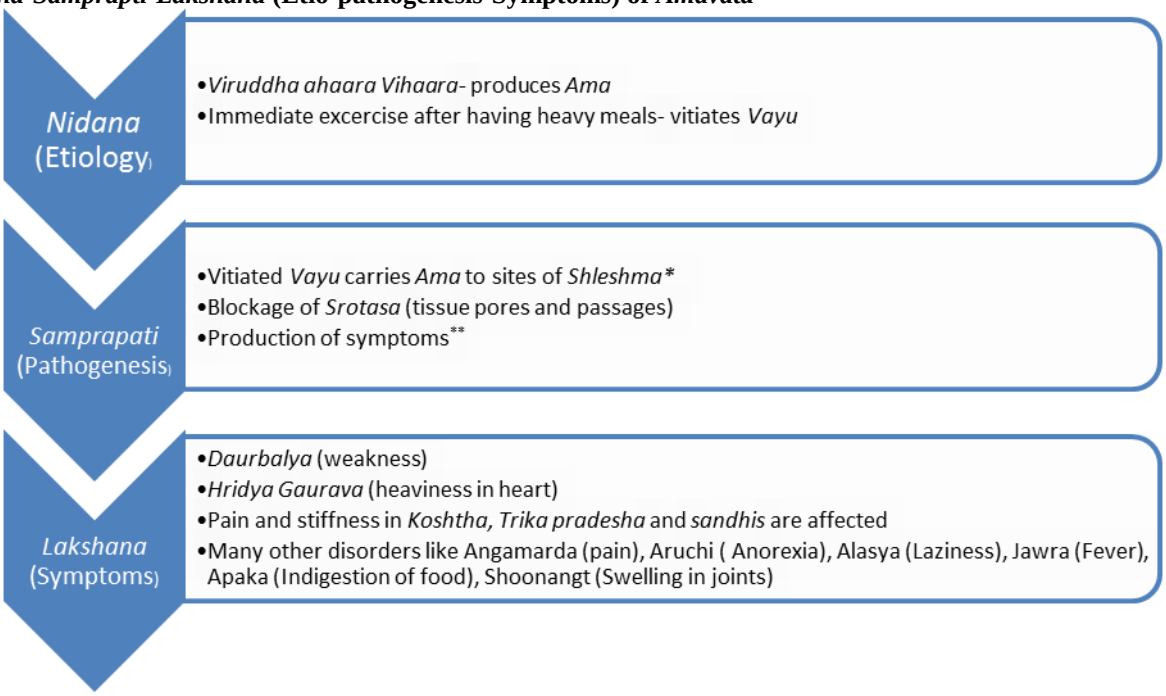
OBJECTIVES

1. To understand the pharmacodynamics of *Bhasma* in *Amavata*.
2. To correlate *Bhasma* properties with modern nanomedicne principles.
3. To highlight their efficacy and safety in inflammation and joint disorders.

MATERIALS AND METHODS

This conceptual study is based on a critical review of classical Ayurvedic textssuch as *Madhav Nidana*, *Rasa Tarangini*, *Rasa Ratna Samuchhya* along with modern scientific literature. *Bhasma* like *Abhraka Bhasma*, *Lauha Bhasma*, *Tamra Bhasma* and *Naga Bhasma* were selected for the *Deepana*, *Pachana* and *Shothahara* actions In *Amavata*. Analytical studies employing TEM, SEM and XRD were reviewed to establish that Bhasma possess nanoparticles (10-100nm) with enhanced bioavailability and targeted therapeutic effects compared to modern nanomedicine.

***Nidana-Samprapti-Lakshana* (Etio-pathogenesis-Symptoms) of *Amavata*[4]**



Correlation with Rheumatoid Arthritis

Rheumatoid Arthritis (RA)is the most common persistent inflammatory arthritis, occurring throughout the world and in all ethnic groups. The prevalence is 0.8-1.0% with female to male ratio of 3:1. The clinical course is prolonged, with intermittent exacerbations and remissions.[5]

Etiopathogenesis[6]

Genetic, epigenetic and environmental factors

⇩

Infiltration of the synovial membrane with lymphocytes, plasma, dendritic cells and macrophages

⇩

Lymphoid follicles formed within the synovial membrane

⇩

T and B cell interactions lead B cells to produce cytokines and antibodies

⇩

Synovial macrophages activated by immune complexes producing inflammatory cytokines

⇩

Cytokines act on synovial fibroblasts

⇩

Promote swelling of the synovial membrane and damage to tissue and cartilage

⇩

Osteocytes activated by RANKL and chondrocytes by cytokines drive destruction of bone and cartilage respectively.

Clinical features of RA[7]	Features of Amavata[8]
Pain	*Sandhishoola, Angamarda*
Joint swelling	*Sandhishoth*
Stiffness in joints of hands, feet wrists	*Sandhigraha*
Large joint involvement	*Sandhishoola-shotha-graha*
Systemic symptoms	*Aruchi, Pipasa, Alasya, Gaurava, Jwara, Apaka*
Extra-articular features	

To understand the role of *Bhasma* in the management of *Amavata*, it is essential to review the properties and therapeutic significance of commonly used *Bhasma*. Ayurveda describes several *Rasaushadhi* with potent *Deepana*, *Pachana* and *Shothahara* and *Rasayana* actions that help correct *Agnimandya*, eliminate *Ama* and pacify *Vata Dosha*. Among them *Abhrak Bhasma*, *Swarna Bhasma*, *Rasa-sindoo*r are most frequently employed due to their proven efficacy and safety.

Bhasma* used in *Amavata

S. No.	Name of *Bhasma*	Rasa	Guna	Virya	Vipaka	Present in formulations
1.	*Kajjali*	-	-	-	-	*Amavatari Rasa, Sameerpannaga Rasa, Amavatari Vajra Rasa, Ramban Rasa, Amavateshwara Rasa, Panchanan Rasa Lauha, Vatagajendrasingha Rasa, Brihat Yograj Guggulu*
2.	*Abhraka Bhasma*[9]	*Madhura* (Sweet), *Kashaya* (Astringent)	*Laghu* (Light), *Snigdha* (Unctuous)	*Ushna* (Hot)	*Madhura* (Sweet)	*Amavatari Vajra Rasa, Panchanan Rasa Lauha, Vatagajendra Singh Rasa, AmapramathiniVatika, Vidangadi Lauha*
3.	*Swarna Bhasma*[10]	*Madhura* (Sweet)	*Laghu* (Light), *Snigdha* (Unctuous)	*Sheeta* (Cold)	*Madhura* (Sweet)	*Swarna Vasant Malti Rasa, Swarna Malini Vasant Rasa, Soota Shekhara Rasa, Swarna Pushpa Rasa.*
4.	*Lauha Bhasma*[11]	*Kashaya* (Astringent), *Tikta* (Bitter)	*Laghu* (Light), *Ruksha* (Dry)	*Ushna* (Hot)	*Katu* (Pungent)	*Amavatarivajra Rasa, Amavateshwar Rasa, Triphladi Lauha, Panchanan Rasa Lauha, Vatagajendra Singh Rasa, AmapramathiniVatika, Vidangai Lauha*
5.	*Tamra Bhasma*[12]	*Tikta* (Bitter), *Kashaya* (Astringent), *Katu* (Pungent)	*Laghu* (Light), *Ruksha* (Dry), *Tikshna* (Sharp)	*Ushna* (Hot)	*Katu* (Pungent)	*Vatagajendra Singh Rasa, Amavateshwar Rasa*
6.	*Naag Bhasma*[13]	*Kashāya* (Astringent), *Madhura* (Sweet)	*Guru* (Heavy), *Snigdha* (Unctuous)	*Ushna* (Hot)	*Madhura* (Sweet)	*Vatagajendra Singha Rasa*
7.	*Vanga Bhasma*[14]	*Madhura* (Sweet), *Kashāya* (Astringent)	*Laghu* (Light), *Snigdha* (Unctuous)	*Sheeta* (Cold)	*Madhura* (Sweet)	*Brihat Yograj guggulu*

1. *Kajjali*[15]- The word *Rasaushadhis* emphasizes the importance as a prime ingredient *Rasa* (synonym of *Parada*), mercury in English. Another element, which plays an important role next to *Rasa* among *Rasaushadhis* is *Gandhaka* (Sulphur). *Kajjali* is the primary compound of these two basic ingredients. It has *Rasayana* (counteracting the effects of ageing) and *Yogavahi* (which potentiates the action of drug and also carries the drug to its action site) properties when prescribed with the particular adjunct (*Sahapana*) and vehicle (*Anupana*). In a previous study, the SEM study of *Kajjali* sample shows about 90% of particles range from 60nm to 200nm. For the effective role in therapeutic bioavailability of metallic and mineral preparation, particle size is one of the important factors, as it decides the permeability of drug through cells, tissues and blood capillaries. It has been reportedthat nanoparticles exhibited a size dependent uptake from the intestine and its passage via the mesentery lymph supplyand lymph node to the liver with significant absorption of particles<100nm.

2. *Abhraka Bhasma*- Biotite mica enriched with Fe(2+) ions are widely used as a major mineral ingredient in traditional pharmaceutical science of alchemy.[16] *Abhraka Bhasma* (mica ash), a pharmaceutical product containing treated mica has been used as major ingredient in many formulations used in *Amavata*. The conversion of *Abhraka* into *Abhraka Bhasma* involves purification steps that particularly influence the structural distortion while cracks and spallations of the micaceous plateseating and quenching can form nano-size particles. Carboxylic acids and other organic molecules present in quenching media through an ion exchange process serve

as chemical modifiers of mica.[17] These nano-oxide particles are converted into a more favourable oxidation form for human consumptionwhen the herbo-metallic mixture is incinerated in closed vessels.[18] *Abhraka Bhasma* is *Madhura, Snigdha, Sheeta* in nature.[19] It helps in *Deepana*and has *Rasayana*property.[20] It is commonly used Ayurvedic drug against many diseases and has hepatoprotective action. When used with correct *Anupana*, it helps to cure all the diseases.[21]

3. Swarna Bhasma[22] -*Swarna Bhasma* (Gold *Bhasma*) has been used therapeutically in Indian System of Medicine since centuries. *Swarna Bhasma* has been well characterized physicochemicallyand since it contains more than 90% of gold nanoparticles, it may also be therapeutically applied in similar lines like Gold nanoparticles. It has been demonstrated that uptake of Gold nanoparticlesoccurred in the small intestineby absorption through single, degrading enterocytes in the process of being extruded from a villus and gold nanoparticles typically less than 58 nm in size ultimately reached blood and various organs through blood. These biosynthesized Gold nanoparticles achieved positive wound repair mechanisms in inflammatory function. These are an alternative source for treating inflammation in a natural way. Inflammation is a cascade process that produces immune responsive compoundssuch as interleukinsand cytokinins which can be produced by keratinocytes including T Lymphocytes, BLymphocytes and Macrophages. Various inflammatory mediatorsssuch as enzymes, antibodies are secreted from the endocrine system. Other potential anti-inflammatory agents such as cytokines, IL-1, IL-2 are secreted from the primary immune organs. These anti-inflammatory mediators induce the healing process. *Swarna Bhasma* is *Snigdha* in nature and has *Madhura Vipaka* which help in pacifying vitiated *Vata*.[23] Some *Acharya* are also of the opinion that it has *Madhura, Tikta, Kashaya* and *Katu Rasa* which helps it in *Deepana Karma.*

Gold salt appears to be slow acting neurotoxic drugs that significantly decreas the intrasynovial concentration of substance P, a well known inflammatory neuropeptide, in arthritis patients. Swarna Bhasma is useful in the treatment of rheumatoid arthritis. It works on ANA (Antinuclear antibody), Swarna Bhasma destroys the production of ANA. It has Vatanulomak and Aampachak properties.[24]

4. Lauha Bhasma[25]- Recent studies show that Heating & Quenching and the calcinations bring microcracks on the surface of the iron, which improved the reactivity with the herbal constituents in addition to incorporating nanostructured features. Further, the use of plant products facilitated the removal of F^{e3+} present in the raw material by forming soluble complexes. The F^{e2+} present in the raw materials also form an insoluble complex with the herbal constituents in the presence of UV radiation. Lauha Bhasma is Tikta, Snigdha and Sheeta in nature, its Tikta Rasa helps in Agnivardhanawhile Snigdha nature helps in normalizingaggrevated Vata, therefore it is used in Amavata, Amadosha, ShothaYakrita disorders and in Lekhana Karma.[26]

5. Tamra Bhasma- Copper (Tamra Bhasma)- Tamra Bhasma is used as a single drug and also in combination with many medicinal plant juices and then repeated calcinations performed with air so that the metallic state is transformed into the corresponding oxide form/ Bhasma form.[27] Likewise Abhraka Bhasma, the principle involved in Tamra Bhasma is same that give it nano-size form. It is used for the management of Arthritis and also has hepatoprotective effect.[28] It is Tikta, Kashaya, Madhura and Amla in Rasa, and Katuin Vipaka. It helps in Kaphanashana, Lekhana and also alleviates pain and swelling[29] thereby relieving symptoms of Amavata.

X-ray diffraction analysis and scanning electron microscopy results revealed that the crystallite size of *Bhasma* powder was less than 100 nm and nano crystallites of agglomerated size in micrometer.[30]

6. Naga Bhasma: Heating and Quenching procedure during purification and heat treatment or incineration can reduce particle size of Naga Bhasma upto nanometers. Naga Bhasma being Tikta in Rasa, and Snigdha in nature, is Vata-Kaphaghna (main cause of Amavata), Deepana, relieves Amashoola, Amashotha and eventually helpful in treating Amavata.[31]

Vanga Bhasma-The XRD of *Vanga Bhasma* showed its crystalline structure. The major component (over 95%) was Tin Oxide, possibly Cassiterite. The predominant peaks in the sample (*Vanga Bhasma*) corresponded to major phase comprising SnO2. During the synthesis of nanomaterials, amorphous materials are subjected to calcination to transform the same to crystalline materials, with degree of crystallinity increasing with increasing calcination temperature.(15) Vanga Bhasma is also prepared by calcination at a high temperature of 800-1000 °C. This also facilitates the formation of nano sized *Vanga Bhasma* particles.[32]

1. *Sukshma Strotogamitva* (Nano-level penetration)[33]

Bhasma- Particle size = 1-100nm

This *Sukshmatva* allows them to cross biological membranes and reach deep *Dhatu*(tissues)- exactly where *Ama* and *Vata* have localized.

Thus, act directly at the site of inflammation and obstruction.

2. *Ama-pachana* and *Agni-deepana Karma* (Metabolic activation)[34]

- *Bhasma* stimulate *Jathragni* and *Dhatvagni*, helping digest and metabolize ***Ama*.**
- They normalize metabolism both at the gut level (correcting *Agni*) and cellular level (enhancing mitochondrial & enzymatic activity).

Modern correlation

- Nanoparticles of metals like *Suvarna* (Au), *Rajata* (Ag), *Tamra* (Cu), and *Abhraka* (Mica) exhibit antioxidant, anti-inflammatory, and mitochondrial-boosting properties — helping clear inflammatory toxins and repair tissue.

3. *Vata-Shamana* (Neuromuscular modulation)[35]

- *Bhasmas* like *Suvarna*, *Vanga*, and *Abhraka* pacify *Vata* by stabilizing nerve conduction and tissue nutrition (*Dhatuposhana*).
- This reduces *shoola* (pain) and *stambha* (stiffness) in *Amavata.*

Modern view

- Gold and silver nanoparticles modulate cytokines like TNF-α, IL-1β, IL-6, reducing inflammatory signaling — which parallels *Vata-shamana* and *Shotha-hara* actions.

4. *Rasayana* Effect (Tissue rejuvenation & *Oja vardhana*)[36]

- Many *Bhasmas* act as *Rasayanas* — strengthening *Dhatus*, enhancing *Ojas*, and supporting immune modulation.
- This is crucial in *Amavata*, where chronic inflammation leads to *Dhatukṣaya* (tissue depletion).

Modern correlation

- Nanoparticles stimulate antioxidant defenses (↑ SOD, catalase, glutathione), support cartilage repair, and modulate immune responses — equivalent to *Rasayana karma*.

5. *Srotoshodhana* (Channel cleansing)[37]

- Due to *Ama* accumulation, *srotas* (microchannels) become blocked.
- The *Laghu* (light) and *Shukṣma* (fine) nature of *Bhasmas* helps remove *Srotorodha* by clearing micro-obstructions, restoring free flow of *Vata* and nutrients.

Modern link

- Nanoparticles improve microcirculation and lymphatic drainage, reduce oxidative sludge and inflammatory debris, acting as detoxifying agents at the cellular level.

DISCUSSION

Ayurvedic concept	Modern Mechanism	Result in *Amavata*
Suksmatva	Nanoparticle penetration	Site-specific action at joints
Agni-deepana/ Ama Pachana	Enzyme & mitochondrial activation	Detoxification, reduced inflammation
Vata- Shamana	Cytokine & nerve modulation	Pain relief & mobility
Srotoshodhana	Improved circulation & drainage	Reduced Stiffness & Swelling
Rasayana	Antioxidant, immune modulation	Tissuew rejuvenation & Vitality

The successful preparation of any *Ayurvedic* formulation depends on the proper selection of ingredients based on their main action, palatability, stability, shelf life, synergism, bio-enhancers, and antidotal properties. These ingredients may be of metallic, mineral, or herbal origin. Formulations containing only metallic or mineral substances may not be fully compatible with the body due to their inorganic nature, whereas purely herbal preparations may not be potent enough to counter severe diseases. To achieve balance, ancient *Acharyas* since the 8th century introduced ***Rasaushadhis***, formulations combining metallic and herbal ingredients to enhance therapeutic efficacy and stability.

Rasaushadhis may also include metals or minerals processed with herbal media. Their preparation involves several stages, from simple triturating to complex heat treatments, resulting in nano-sized particles. The processing of crude metals into nano-particles mainly involves **purification (*Shodhana*)** and **calcination (*Maraṇa*)**. During purification, metals and minerals are treated with herbal extracts through procedures such as *Bhavana* (levigation), *Mardana* (trituration), *Swedana* (boiling), and *Nirvapa* (heating and quenching). These steps remove impurities, soften metals, and convert them into nano-oxide forms.

In calcination, the purified materials are transformed into ***Bhasma*** through repeated *Bhāvana* with herbal decoctions and controlled heating (*Agni Saṃyoga*). The herbal extracts, rich in secondary metabolites like flavonoids, alkaloids, and phenolic acids, assist in reducing ionic forms into metallic nanoparticles.

When these nanoparticles are incorporated into medicines, they are termed ***Rasaushadhis*** or Ayurvedic nanomedicines. They possess unique properties such as: use in small doses, absence of unpleasant taste, rapid action, effectiveness in critical diseases, and long shelf life—qualities highly valuable in managing chronic disorders like ***Amavāaa***.

When these nanoparticles are involved in the preparation of medicines, then the medicines are called as *Rasaushadhis* or nanomedicines having following properties-

Alpamatropyogitvatarucherprsangatah
Kshipramarogyadayitvataaushdhebhyoadhikorasah.

which means *Rasaushadhis* are used in

- Lesser quantities
- Produce no Aruchi
- Faster action
- Used in critical diseases

- Have Longer shelf lives

REFERENCES

1. Kumbhare (Patil) Minakshi, Chaudhary V., Varhadi Shilpa. Amavata (Rheumatoid Arthritis): An Overview. (Ayurline) International journal of Research in Indian Medicine, 2019. Jan-Mar; 03: Issue 1 st.
2. Gupta K.L. Virupaksha, Pallavi G, Patgiri BJ, Prajapati PK. Critical review on the pharmaceutical vistas of Lauha Kalpas (Iron formulations). Journal of Ayurveda and Integrative Medicines, 2012 Jan-Mar. 3(1): 21-28.
3. Bhattacharya B, Jha CB. Evolution of Authentic Rasaushadhis towards Pharmaceutical Requirements, International Journal of Pharmacology and Therapeutics, 2016; 6(2): 11-19.
4. Acharya Madhava, Tripathi Brahmananda (Rep. Ed. 2005). Madhava Nidana, Varanasi, India: Chaukhambha Subharati Prakashan, Part 1, Chapter 25, Verse 1-6.
5. Davidson, Stanley & amp; Colledge, Brian R. et al. (Ed.) (Rep. 2014 A.D.). Davidson's Principles &amp Practice of Medicine (22nd ed.). British Library Catalouging in Publication Data, Chapter 25, Page no. 1096.
6. Davidson, Stanley & Colledge, Brian R. et al. (Ed.) (Rep. 2014 A.D.). Davidson's Principles & Practice of Medicine (22nd ed.). British Library Catalouging in Publication Data, Chapter 25, Page no. 1096.
7. Davidson, Stanley & amp; Colledge, Brian R. et al. (Ed.) (Rep. 2014 A.D.). Davidson's Principles & Practice of Medicine (22nd ed.). British Library Catalouging in Publication Data, Chapter 25, Page no. 1097.
8. Acharya Madhava, Tripathi Brahmananda (Rep. Ed. 2005). Madhava Nidana, Varanasi, India: Chaukhambha Subharati Prakashan, Part 1, Chapter 25, Verse 6.
9. *Rasatarangini* (by Sadananda Sharma), Taranga 11, verses 20–24.
10. Sharma S. *Rasatarangini.* 15th Taranga, verses 19–24. Delhi: Motilal Banarsidass, 2011.
11. Sharma S. *Rasatarangini.* 19th Taranga, verses 9–12. Delhi: Motilal Banarsidass, 2011.
12. Sharma S. *Rasatarangini.* 17th Taranga, verses 10–15. Delhi: Motilal Banarsidass, 2011.
13. Sharma S. *Rasatarangini.* 18th Taranga, verses 20–24. Delhi: Motilal Banarsidass, 2011.
14. Sharma S. *Rasatarangini.* 18th Taranga, verses 84–88. Delhi: Motilal Banarsidass, 2011.
15. Wijenayake A et al. The role of herbometallic preaparations in traditional medicine—a review on mica drug processing and pharmaceutical applications. Journal of Ethnopharmacol, 2014 Sep; 155(2): 1001-1010.
16. Wijenayake A et al. The role of herbometallic preaparations in traditional medicine—a review on mica drug processing and pharmaceutical applications. Journal of Ethnopharmacol, 2014 Sep; 155(2): 1001-1010.
17. Wijenayake A et al. The role of herbometallic preaparations in traditional medicine—a review on mica drug processing and pharmaceutical applications. Journal of Ethnopharmacol, 2014 Sep; 155(2): 1001-1010.
18. Wijenayake A et al. The role of herbometallic preaparations in traditional medicine—a review on mica drug processing and pharmaceutical applications. Journal of Ethnopharmacol, 2014 Sep; 155(2): 1001-1010.
19. Kulkarni Duttatreya Anant (Rep. 2017 A.D.) Rasratna Samuchhya. New Delhi, India: Meharchand Lachchamandas Publication, Chapter 2, Verse 2. Page no. 18.
20. Kulkarni Duttatreya Anant (Rep. 2017 A.D.) Rasratna Samuchhya. New Delhi, India: Meharchand Lachchamandas Publication, Chapter 2, Verse 2. Page no. 18.
21. Kulkarni Duttatreya Anant (Rep. 2017 A.D.) Rasratna Samuchhya. New Delhi, India: Meharchand Lachchamandas Publication, Chapter 2, Verse 2. Page no. 18.
22. Paul Will, Sharma C.P. Blood compatibility studies of Swarna Bhasma (gold bhasma, an Ayurvedic drug. International Journal of Ayurveda Research, Jan- Mar, 2011; 2(1).
23. Kulkarni Duttatreya Anant (Rep. 2017 A.D.) Rasratna Samuchhya. New Delhi, India: Meharchand Lachchamandas Publication, Chapter 5, Verse10-11. Page no. 93.
24. Journal of Ayurveda and Integrated Medical Sciences, July - Aug 2021; 6(4). The role of Swarna Bhasma in the treatment of Autoimmune disease.
25. NO REFERENCE
26. Sharma, Sadananada & amp; Shastri Kashinatha. (Rep. 2014 A.D.). Rastarangini (11th ed.). Delhi, India: Motilal Banarsidas Office, 20 th Tarang, Verse 83, 84, 90. Page no. 507-510.
27. NO REFERENCE
28. Study on physical properties of Ayurvedic nanocrystalline Tamra Bhasma by employing modern scientific tools, Journal of Ayurveda and Integrative Medicine R.Kr. Singh et al. / Journal of Ayurveda and Integrative Medicine, 2019; 10: 88-93.
29. NO REFERENCE
30. Analytical study of Vanga Bhasma, ISSN: 0976-5921
31. Mishra Gulraj S. (Rep. ed. 2007 A.D.). Ayurveda Prakasha. Varanasi, India: Chaukhmbha Bharti Academy, Chapter 3, Verse 145-146. Page no. 373.
32. Kulkarni Duttatreya Anant (Rep. 2017 A.D.) Rasratna Samuchhya. New Delhi, India: Meharchand Lachchamandas Publication, Chapter 5, Verse 171. Page no. 126.
33. Chakraborty S. et al., J. Ayurveda Integr Med (2021): "Bhasmas exhibit nanoscale properties

enabling enhanced bioavailability and targeted tissue action."
34. Sarkar PK et al., Indian J Exp Biol (2015): "Metal-based Ayurvedic preparations enhance enzymatic activity and modulate oxidative stress."
35. Jain TK et al., Molecular Pharmaceutics (2009): "Gold nanoparticles attenuate arthritis by suppressing inflammatory cytokines."
36. Patwardhan B et al., J Ethnopharmacol (2014): "Rasayana drugs exhibit adaptogenic and immunomodulatory actions."
37. Nanoparticles improve microcirculation and lymphatic drainage, reduce oxidative sludge and inflammatory debris, acting as detoxifying agents at the cellular level.