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CARDIOPROTECTIVE POTENTIAL OF BHASMA: A COMPREHENSIVE REVIEW OF MECHANISMS & THERAPEUTIC APPLICATIONS

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INTRODUCTION

Cardiovascular diseases (CVDs) remain one of the leading causes of mortality and morbidity worldwide, encompassing a wide range of disorders affecting the heart and blood vessels, including coronary artery disease, hypertension, stroke, arrhythmias, and heart failure. The growing prevalence of sedentary lifestyles, unhealthy dietary habits, stress, diabetes, obesity, and aging populations has significantly increased the global burden of cardiovascular disorders. Despite substantial advances in modern pharmacotherapy and interventional cardiology, long-term management of CVDs often remains challenging due to adverse drug reactions, high treatment costs, drug resistance, and incomplete restoration of cardiac function. Consequently, there is increasing scientific interest in exploring traditional systems of medicine and natural therapeutics for safer and more holistic cardioprotective strategies.[6,11]

Ayurveda, the ancient Indian system of medicine, emphasizes a holistic approach to health by maintaining harmony among body, mind, and spirit. Among its specialized branches, Rasa-Shastra deals with the preparation of herbo-mineral and metallic

formulations known as Bhasmas. Bhasmas are unique Ayurvedic nanomedicines produced through repeated purification (Shodhana) and incineration (Marana) processes, resulting in highly bioavailable and therapeutically potent formulations.9 Traditionally, these preparations have been extensively utilized for the management of chronic ailments, including metabolic disorders, respiratory diseases, neurodegenerative conditions, and cardiovascular abnormalities. Classical Ayurvedic texts describe several Bhasmas such as Swarna Bhasma, Abhraka Bhasma, Mukta Bhasma, Pravala Bhasma, and Lauha Bhasma as possessing rejuvenating (Rasayana), antioxidant, adaptogenic, and tissue-strengthening properties that may contribute to cardiovascular protection.

Variability in preparation methods, safety concerns related to heavy metal content, lack of standardized dosage regimens, and limited mechanistic studies continue to pose challenges for their wider clinical acceptance. Therefore, a comprehensive evaluation of available evidence is necessary to bridge traditional. Ayurvedic knowledge with modern biomedical understanding. This review aims to critically examine the cardioprotective potential of various Ayurvedic Bhasmas, focusing on their pharmacological mechanisms, therapeutic applications, physicochemical characteristics, and safety profiles.

AIM

To evaluate potential of Bhasma in cardiovascular disease through its mechanism.

OBJECTIVES

1. To assess cardioprotective action of different Bhasma.
2. To know the mechanism of different Bhasma.

MATERIALS AND METHODS

Different classical texts of Ayurveda, modern medicine websites & Ayurvedic as well as modern articles.

IDENTIFICATION OF THE KEYWORDS

Sr. No.	Category	Keywords
1.	Disease /condition	Cardioprotective activity, myocardial infarction, coronary vascular disease, IHD
2.	Intervention	Bhasma, Herbo-metallic medicine
3.	Mode of activity/activity assessed	Serum cholesterol, S. triglycerides, Free fatty acids, HB, LOX (Lysyl oxidase) activity, S.G.P.T., S.G.O.T., Serum alkaline phosphatase,
4.	In-vivo study model	L-Isoprenaline induced, isoproterenol (ISO)-induced.
5.	Animal strain	Albino rats, male Sprague Dawley rats

Action of Bhasma on Cardiovascular Pathology

Ayurvedic bhasma formulations act through multiple mechanisms that mention below pathological processes.

Sr. no.	Bhasma	Mechanism
1.	Swarna Bhasma	Antioxidant, anti-inflammatory, free radical scavenging.[19]
2.	Lauha Bhasma	Corrects anemia, improves O2 delivery, decreases free radicals.[15]
3.	Kasis Bhasma	Corrects anemia, improves O2 delivery[13,16]
4.	Abhraka Bhasma	Antioxidant, reduces lipid peroxidation
5.	Mukta Bhasma	Cooling, calming effect, antioxidant[12]
6.	Praval Bhasma	Myocardial conductance stabilizer[9]
7.	Tamra Bhasma	Antioxidant, cardioprotective lipid metabolism regulation[18]
8.	Swarna makshik Bhasma	Enhances lysyl oxidase vascular repair
9.	Rajata Bhasma	Antioxidant, reduces lipid peroxidation[5]
10.	Kansya & Pittala Bhasma	Lipid metabolism regulator.[2]
11.	Vimala Bhasma	Lipid metabolism regulator.[2]
12.	Vanga bhasma	Lipid metabolism regulator.[2]

Cardioprotective Activities of Selected Bhasmas.

Sr. no.	Bhasma	Cardioprotective activity
1.	Swarna bhasma	Reduces plaque, improves circulation, myocardial protection[2]
2.	Lauha bhasma	Reduces cardiac workload, improves circulatory efficiency[15]
3.	Abhraka Bhasma	Prevents endothelial dysfunction, arterial stiffness.[2]
4.	Mukta Bhasma	Stabilizes vascular system, anti-arrhythmic, anti-hypertensive[14]
5.	Praval Bhasma	Anti-arrhythmic, anti-inflammatory.[9]
6.	Tamra Bhasma	Improves cardiac function, reduces hyperlipidemia.[2]
7.	Swarna makshik Bhasma	Stabilizes atherosclerotic plaques, vascular protection
8.	Rajata Bhasma	Lipid lowering, endothelial protection
9.	Kasis Bhasma	Reduces cardiac workload, Improves oxygen supply.
10.	Kansya & pittala Bhasma	Reduced lipid level, Reduced plaque formation.[2]
11.	Vimala bhasma	Reduced lipid level, Reduced plaque formation.[2]
12.	Vanga bhasma	Reduced plaque formation.[2]

Swarna Bhasma helps in reducing oxidative stress by neutralizing free radicals, thereby protecting cardiovascular tissues from damage. It also decreases vascular inflammation and reduces atherosclerotic plaque formation.[19]

Lauha Bhasma is beneficial in anemia and cardiovascular weakness by increasing hemoglobin levels and improving oxygen delivery to tissues. It enhances tissue oxygenation and reduces cardiac workload, thereby improving overall heart efficiency.[9,15]

Kasis Bhasma is used to support Rakta Dhatu and conditions associated with impaired blood physiology. By supporting normal haemopoietic and circulatory functions, it may contribute to improve iron status and supports red blood cell production, which helps in correcting anemia and reducing hypoxia. By improving oxygen supply to tissues, it reduces cardiovascular stress and supports circulatory function.[13]

Abhrak Bhasma is considered a potent Rasayana in Ayurveda. It exhibits antioxidant activity that helps reduce oxidative stress and endothelial injury. It decreases lipid

peroxidation, reduces plaque formation, and improves endothelial-dependent vasodilation, vascular dysfunction and arterial stiffness, thereby supporting cardiovascular health.[2]

Mukta Bhasma has a cooling and calming effect on the cardiovascular system. It supports blood pressure regulation, stabilizes vascular tone, and helps in reducing stress-related cardiac disturbances. Its proposed actions include supporting normal cardiac rhythm and maintaining vascular stability.[12,14]

LOX functions

- Cross linking collagen & elastin.
- Crosslinking collagen & elastin.
- Stabilizing fibrous cap of plaques.
- Maintaining vascular wall integrety.

Swarna Makshik Bhasma, is traditionally regarded as a Rasayana and Balya preparation. Due to its copper content, enhances lysyl oxidase (LOX) activity. This helps in cross-linking collagen and elastin, stabilizing fibrous plaques, and maintaining prevents plaque rupture, reduces the progression of atherosclerosis, decreases thrombus formation, and improves vascular repair.[2]

The properties of the **Rajat bhasma** suggest its role in improving lipid metabolism and reducing abnormal lipid accumulation in blood vessels. By lowering total cholesterol and correcting the lipid profile, it may help in reducing lipid deposition within arterial walls, thereby showing potential action against atherosclerosis and related cardiovascular disorders.[2]

Pravala Bhasma provides calcium-mediated cardiac support and improves cardiac conductance9. It stabilizes myocardial excitability. Pravala Bhasma possesses predominantly Sita and Pittahara properties and is traditionally used for disorders associated with aggravated Pitta. It reduces inflammation in vascular conditions, and is beneficial in conditions such as cardiac fibrillation, myocardial excitability, and inflammatory disorders.[1]

Tamra Bhasma is traditionally considered useful in disorders involving Kapha and Meda, which makes it relevant to the Ayurvedic understanding of metabolic and lipid-related disorders. It acts mainly through correction of lipid metabolism. Its hypolipidemic and

cardioprotective effects help reduce atherosclerotic changes and improve cardiovascular health.[9,18]

Vimala Bhasma improves mitochondrial respiration and increases beta-oxidation, thereby enhancing energy metabolism and regulating lipid metabolism genes. It helps reduce lipid levels in hyperlipidemia and decreases plaque formation in atherosclerosis, thereby potentially supporting vascular health.[2]

Kansya and **Pittala bhasma** help reduce excess lipids and improve lipid metabolism, thereby reducing dyslipidemia and preventing atherosclerosis. They lower lipid levels in hyperlipidemia and reduce plaque formation in atherosclerosis. These effects may contribute to maintaining vascular health.[2]

Vanga bhasma is mainly used in prameha i.e diabetes. Due to its vata and kaphaghna karma it shows anti-lipidemic activity and supports in cardiac health.[2]

Therapeutic applications of Bhasma[2]

Sr.no.	Bhasma	Indications
1.	Swarna bhasma	1)Atherosclerosis, 2)Ischemic injury
2.	Lauha bhasma	1)Anemia-induced cardiac stress[15]
3.	Abhraka Bhasma	1)Atherosclerosis [2,3] 2)Hyperlipidemia
4.	Mukta Bhasma	1)Hypertension[14] 2)Stress related CVD[12]
5.	Praval Bhasma	1)Arrhythmia 2)Vascular inflammation 3)Cardiac fibrillation.[1]
6.	Tamra Bhasma	1) Atherosclerosis 3) impaired circulation 2) Dyslipidemic 4) oxidative stress [18]
7.	Swarna makshik Bhasma	1)Atherosclerosis 2)Vascular injury
8.	Rajata Bhasma	1)Hyperlipidemia 2)Atherosclerosis
9.	Kasis Bhasma	1)Anaemia 2)Palpitation (hrudrav)[13]
10.	Kansya & Pittala Bhasma	1)Hyperlipidemia 2)Atherosclerosis
11.	Vimala Bhasma	1)Anaemia
12.	Vanga bhasma	1)Atherosclerosis.

DISCUSSION

Cardiovascular diseases remain a major cause of morbidity and mortality worldwide. The present review highlights the potential cardiovascular benefits of various Ayurvedic Bhasmas through their antioxidant, anti-inflammatory, hypolipidemic, cardioprotective, and vascular-protective properties. These actions may help reduce oxidative stress, regulate lipid metabolism, protect vascular endothelial function, and maintain cardiac health.

Swarna Bhasma may provide cardioprotective benefits by reducing oxidative stress and inflammation. Lauha Bhasma and Kasis Bhasma may support oxygen transport by improving iron status and correcting iron-deficiency anemia. Mukta Bhasma may have a calming effect, while Pravala Bhasma may help maintain cardiac function. Abhraka Bhasma may offer antioxidant and vascular-protective effects.

Swarna Makshika Bhasma may contribute to vascular repair and atherosclerotic plaque stabilization, whereas Rajata, Tamra, Vimala, Kansya, and Pittala Bhasmas may influence lipid metabolism and help control hyperlipidemia. Collectively, these properties suggest potential roles for different Bhasmas in cardiovascular health.

The possible mechanisms of action of Bhasmas include free-radical scavenging, reduction of inflammation, endothelial protection, regulation of Lipid metabolism, and support of cellular function. Their fine particle characteristics may influence bioavailability; however, their pharmacological effects and clinical significance require further scientific investigation. Despite promising traditional uses and preliminary findings, important limitations remain, including variations in preparation methods, inadequate standardization, and insufficient evidence regarding dosage, toxicity, and long-term safety. Concerns about heavy-metal toxicity and the lack of large-scale clinical trials also limit their acceptance in modern cardiovascular medicine.

CONCLUSION

Ayurvedic Bhasmas possess significant potential as supportive cardioprotective agents due to their antioxidant, anti-inflammatory, hypolipidemic, cardiotonic, and vascular stabilizing properties. Different Bhasmas act through distinct mechanisms such as reduction of oxidative stress, improvement of lipid metabolism, enhancement of oxygen delivery, stabilization of vascular function, and protection against atherosclerotic changes. These multidimensional actions indicate their possible therapeutic role in conditions such as hypertension,

atherosclerosis, anemia-associated cardiac stress, myocardial dysfunction, and vascular inflammation.

Among the reviewed formulations, *Swarna Bhasma, Lauha Bhasma, Mukta Bhasma, Abhraka Bhasma, Tamra Bhasma,* and *Swarna Makshik Bhasma* showed particularly promising cardioprotective effects. The integration of Ayurvedic principles with modern pharmacological and nanotechnological research may provide new opportunities for development of safer and more holistic cardiovascular therapies.

Nevertheless, scientific validation through standardized preparation techniques, toxicity studies, molecular research, and well-designed clinical trials is necessary before widespread clinical application can be recommended. Future interdisciplinary research may help establish *Bhasmas* as valuable complementary therapeutic agents in cardiovascular disease management.

REFERENCE

1. Menon J5, Vijayasankar AV, Karalam BS, Balasubramani SP. A study on correlation between method of preparation, surface properties, and medicinal properties of traditional drug: Praval Bhasma. Ancient Sci. Life., 2024; 38(384): 111-116. doi:10.4103/asLasl_107_22
2. Vuyyuru S, Kovi S. The role of Rasaushadhies in the management of Srotosanga w.s.r to Atherosclerotic Vascular disease. J Ayu. Int. Med. Sci., 2025; 10(2): 101-113. doi:10.21760/jaims.10.2.14
3. Teli P, Kasabe S, Jadhav J, Kanase A. Abhrak Bhasma and Si02 contemplated levels of serum cholesterol, triglycerides and free fatty acids in single dose of CC14 intoxicated rat. World J. Pharm. Sci., 2015; 4(9): 1133-1141.
4. Begum R, Chavadi VB. Antimicrobial activity of Abhraka Bhasma prepared with Gomutra, for evaluation of its broad spectrum activity. J. Ayu. Int. Med. Sci., 2017; 2(5).
5. Bhavani MD, Sridurga C. Evaluation of antioxidant activity of Rajata bhasma & Rajata yoga. Ayushdhara. 2017; 4(3).
6. Netala VR, Teertam SK, Li H, Zhang Z. A comprehensive review of cardiovascular disease management: Cardiac biomarkers imaging modalities, pharmacotherapy, surgical interventions, and herbal remedies. Cells, 2024; 13(17): 1471. doi:10.3390/cells13171471.

7. Kundu J, Kundu S. Cardiovascular disease (CVD) and its associated risk factors among older adults in India: Evidence from LASI Wave 1. Clin Epidemiol Glob Health. 2022; 13: 100937. doi:10.1016/ j.cegh.2021.100937
8. Pareek A, Bhatnagar N. Revisiting ancient therapeutic potential of Ayurvedic bhasma. Int J. Pharm. Sci. Res., 2018; 9(8): 3150-3165, doi:10.13040/IJPSR.0975-8232.9(8).3150-65
9. Pal D, Sahu CK, Haldar A. Bhasma: The ancient Indian nanomedicine. J. Adv. Pharm. Technol. Res., 2014; 5(1): 4-12. doi:10.4103/2231-4040.126979
10. Khabade S, Rathi B, Rathi R, Khan M. Cardio-protective (Hridya) formulations described in Yogaratnakara. Drugs Cell. Ther. Hematol., 2021; 10(1): 3750.
11. Lopez EO, Ballard BD, Jan A. Cardiovascular disease. In: StatPearls. Treasure Island (FL): StatPearls Publishing; 2023 Aug 27.[Internet]
12. Joshi N, Sharma K, Peter H, Dash MK.Standardization and quality control parameters for Mukta Bhasma (calcined pearl). Anc. Sci. Life., 2015; 35(1): 42-51. doi:10.4103/0257-7941.164542
13. Chouhan S, Haldar P. Comparative clinical study of Kasis bhasma and Phaltrikadi kwath on Pandu roga. World J Pharm. Sci., 2022; 11(3): 1325-1334. doi:10.20959/wjpps20223-21355.
14. Kumar S, Kumari R, Dash R, Paras K, Singh VB. Ayurvedic management of Hypertension. J Ayu. Int. Med. Sci., 2022; 7(5): 146-149.
15. Health benefits of Lauh Bhasma. Manipal Cigna Health Insurance; [cited 2026 Jun 3]. Available from: manipalcigna.com[Internet].
16. Tubaki BR, Benni JM, Rao N, Prasad UNR. Effect of Ayurveda medications (Kasīsa Bhasma and Dhatrī Avaleha) on iron deficiency anaemia: A randomized controlled study. Anc. Sci. Life., 2016; 36(1): 48-55. doi:10.4103/0257-7941.195406.
17. Rejikumar K. Abhrak. Truemeds; 2026 Mar 17 [cited 2026 Jun 3]. Available from: truemeds.in[Internet].
18. Jagtap CY, Nayak SV, Ravishankar B, Prajapati PK. Cardioprotective activity of Tamra bhasma and Somnathi Tamra bhasma. Researchgate.net:2010 Mar
19. Joshi P, Vyas PP, Singhal HK.A critical appraisal on Suvarna(gold)Bhasma. Int. Journal Research Ayurveda Pharma., 2023; 14(5): 58-62. doi:10.7897/2277-4343.1405146.