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SHANKARA VATI: A LITERARY REVIEW WITH SPECIAL REFERENCE TO ITS CARDIOPROTECTIVE POTENTIAL

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ABSTRACT

Rasashastra is specialized branch of *Ayurveda* mainly deals with *Rasa-Dravyas* which possess properties of *Rasayana*. *Kharaliya Rasayana* is one of most frequently used *Murchitha Parada Yoga*. *Shankara Vati* is a *Kharaliya Rasayana* prepared with *Kajjali* of *Shudha Parada, Shudha Gandhaka, Loha Bhasma, Naga Bhasma* and *Bhavana* with seven *Dravyas namely Kakamachi Swarasa, Chitrakamoola Kwatha, Ardraka Swarasa, Jayanthi Swarasa, Vasa Swarasa, Bilwa Patra Swarasa* and *Arjuna Twak Kwatha* having *Hridya* properties. *Shankara vati* is indicated in *Hridroga, Jeerna-Jwara, Prameha, Kasa, Shwasa, Amavata and Grahani.* The literary review demonstrates that each constituent of *Shankara Vati – Dwiguna Kajjali, Loha Bhasma, Naga Bhasma,* and all seven *Bhavana Dravyas* has documented *Hridya* activity or evidence of cardioprotective properties in classical literature and modern pharmacological studies. Although the formulation is classically indicated in *Hridroga,* a consolidated literary review evaluating its cardioprotective basis is lacking.

KEYWORDS: *Shankara Vati, Hridya, Hridroga,* Cardioprotective potential.

1. INTRODUCTION

Cardiovascular diseases[1] (CVDs) are a broad group of disorders affecting the heart and blood vessels. They encompass a wide spectrum of conditions ranging from structural heart defects to vascular diseases, many of which share common pathophysiological pathways including atherosclerosis, thrombosis, inflammation, and hemodynamic dysfunction. According to WHO, in 2022 they accounted for an estimated 19.8 million deaths which is about 32% of all deaths globally with more than four in five attributable to myocardial infarction or stroke and roughly one third occurring in people under seventy years of age.

In *Ayurveda* the heart is described as *Hridaya* which is the *Moola* of both the *Rasavaha* and the *Pranavaha Srotas*. Pathological derangement of these *Srotas* gives rise to *Hridroga*. *Nidana* according to *Madhavakara* are *Ati-ushna, Adhyashana, Vegaghata, Atichintana, Abhighata*. *Acharya Charaka, Madhavakara, Vagbhata* describe five subtypes - *Vataja, Pittaja, Kaphaja, Sannipataja* and *Krimija Hridroga.*

Kharaliya Rasayana is one of most frequently used *Murchitha Parada Yoga*. The principle used in preparation of *Kharaliya Rasayana* is based on *Bhavana* which enhances the therapeutic efficacy and particle size reduction.

Shankara Vati[2] *is* a *Kharaliya Rasayana* prepared with *Kajjali* of *Shudha Parada, Shudha Gandhaka, Loha Bhasma, Naga Bhasma* and *Bhavana* with seven *Dravyas namely Kakamachi Swarasa, Chitrakamoola Kwatha, Ardraka Swarasa, Jayanthi Swarasa, Vasa Swarasa, Bilwa Patra Swarasa* and *Arjuna Twak Kwatha* having *Hridya* properties. *Shankara vati* is indicated in *Hridroga, Jeerna-Jwara, Prameha, Kasa, Shwasa, Amavata and Grahani.*

The formulation is indicated in *Hridroga, Jeerna-Jwara, Prameha, Kasa, Shwasa, Amavata,* and *Grahani*. Despite

its classical indication in cardiac disorders, a comprehensive literary review examining the cardioprotective rationale of each ingredient remains unavailable. The present review was undertaken to address this gap.

2. MATERIAL AND METHODS

2.1 Source of Data: The present review is based on systematic compilation of data from the following

Classical Sources: *Bhaishajya Ratnavali*, *Rasaratnasamucchya*, *Rasatarangini*, *Rasayogasagara*, *Charaka Samhita*, *Sushruta Samhita*, Textbooks of *Rasashastra* and *Dravyaguna Vijnana*.

Contemporary Sources: Peer-reviewed publications indexed in PubMed, Scopus, and Google Scholar on the pharmacological activities of constituent ingredients, with particular focus on antioxidant, anti-inflammatory, and cardioprotective properties.

3. RESULTS

3.1 Formulation review of *Shankara* Vati

Shankara Vati is a *Kharaliya Rasayana* whose primary reference is the *Bhaishajya Ratnavali* (Hrudrogadhikara, chapter 33, verses 50–54). Additional references are available in ***Rasayogasagara*** with differing ingredient compositions and indications. The formulation name is rooted in the involvement of potent *Rasoushadhis* that signify protection of vital functions.

Table 1: The ingredients of *Shankara Vati* as per the reference are.

Ingredient	Chemical Name / Botanical Name	Category	Therapeutic Action
Shudha Parada[3]	*Hydragyrum*	*Rasadravya* utilized for *Kajjali Nirmana*	*Shadrasa*, *Sara*, *Guru*, *Snigdha* *Tridoshahara* ***Yogavahi***, ***Rasayana***, *Deepana*
Shudha Gandhaka[4]	*Sulphur*	*Rasadravya* utilized for *Kajjali Nirmana*	*Madhura/ Katu,Tikta*, *Kashaya* *Sara*, *Snigdha*, *Ushna Virya* ***Vata-kaphahara***, *Deepana*, ***Vishahara***
Loha Bhasma[5]	*Iron*	*Dhatu Varga*	*Tikta*, *Madhura*, *Kashaya* *Sheeta*, *Sara*, *Guru*, *Ruksha* *Lekhana*, *Balya*, *Yogavahi*, ***Rudhirakrit***, *Rasayana* ***Hridroga***, *Shotha*
Naga Bhasma[6]	*Lead*	*Dhatu Varga*	*Tikta*, *Madhura* *Snigdha*, *Sara*, *Guru* *Ushna Virya* ***Lekhana***, ***Deepana***, *Tridoshahara*
Kakamachi Patra Swarasa[7]	*Solanum nigram* Linn.	*Bhavana Dravya*	*Tikta Rasa*, *Katu Vipaka*, *Laghu*, *Ruksha Guna*, *Anushna Virya* *Tridoshahara*, ***Hridya, Rasayana*** ***Hridroga, Shotha***
Chitrakamoola Kwatha[8]	*Plumbago zeylanica* Linn.	*Bhavana Dravya*	*Katu Rasa*, *Katu Vipaka*, *Tikshna Guna*, *Ushna Virya* ***Deepana***, ***Shothahara***
Ardraka Swarasa[9]	*Zinziber officinale* Mill.	*Bhavana Dravya*	*Katu Rasa*, *Madhura Vipaka*, *Tikshna*, *Ruksha*, *Guru Ushna Virya Pachana*, ***Hridya Hridroga***, *Shothahara*, *Agnimandya*
Jayanti Patra Swarasa[10]	*Sesbania sesban* Merill.	*Bhavana Dravya*	*Katu*, *Tikta Rasa*, *Katu Vipaka*, *Laghu*, *Ruksha Guna*, *Ushna Virya* *Vishaghna*, *Deepana*,
Vasa Patra Swarasa[11]	*Adhathoda vasica* Linn.	*Bhavana Dravya*	*Tikta*, *Kashaya Rasa*, *Katu Vipaka*, *Ruksha*, *Laghu Guna*, *Sheeta Virya* ***Hridya***; ***Hridroga***
Bilwa Patra Swarasa[12]	*Aegle marmelos* Linn.	*Bhavana Dravya*	*Sangrahi*, ***Hridya***, ***Shothahara***
Arjuna Twak Kwatha[13]	*Terminalia arjuna* Roxb.	*Bhavana Dravya*	*Kashaya Rasa*, *Katu Vipaka*, *Laghu*, *Ruksha Guna*, *Sheeta Virya*, ***Hridya***; ***Hridroga***

3.2 Review on Principal ingredients

3.2.1 *Kajjali* [*Shudha Parada* (1 Part) + *Shudha Gandhaka* (2 Part)]

Kajjali is a jet black coloured homogenous mixture of *Shudha Parada* and *Shudha Gandhaka* in 1:2 ratio. *Parada* is denoted as *Shivateja* (essence of Lord *Shiva*) possesses *Tridoshahara, Rasayana, Yogavahi* and *Krimighna* properties while *Gandhaka* is denoted as *Gouriteja* (Essence of *Parvati*) possesses *Ushna Virya, Vata- kaphahara*, *Garavisha*, *Deepana* and *Amapachana* properties. Together the *Yogavahi* property acts as carrier and enhances the bioavailability of the other drugs.

3.2.2 *Loha Bhasma*

Loha Dhatu belongs to *Shudha Dhatu Varga. Loha Bhasma* is *Tikta-Madhura-Kashaya, Sheeta, Guru, Ruksha, Balya, Vrishya, Chakshushya, Rudhirakrit, Lekhana,* and *Tridoshahara*. Its *Vyadhi Prabhava* specifically lists *Hridroga* among its indications, alongside *Sotha, Shula, Pandu, Kamala, Medoroga, Kasa, Shwasa,* and *Prameha*. Iron plays a fundamental role as a component of haemoglobin, myoglobin, and iron-sulphur proteins essential for mitochondrial electron transport. Its *Chakshushya, Rudhirakrit,* and *Balya* properties reflect its role in haematopoiesis and oxygen transport critical for myocardial oxygen delivery and function.

3.2.3 *Naga Bhasma*

Naga categorised under *Putiloha.Naga* is described as *Tikta-Madhura, Snigdha, Guru, Ushna Veerya, Deepana, Rechaka, Grahi, Lekhana, Medhya, Vatakaphahara,* and *Tridoshahara*. *Balya* property helps to strengthen *Hridaya*. Its classical indications include *Prameha, Vatavyadhi, Grahani, Gulma,* and *Raktapradara*.

3.3 Review on *Bhavana Dravya* and their Cardioprotective potential

3.3.1 *Kakamachi*: *Kakamachi* (family Solanaceae) belongs to *Guduchyadi Varga* of *Bhavaprakasha Nighantu* and *Surasadi Gana* of *Sushruta*. Its *Karma* includes *Hridya* and its *Rogagnata* lists *Hridroga*, making it a principal herb in this formulation.

Chemically, the leaves are rich in riboflavin, nicotinic acid, vitamin C, and *β*-carotene; fruits contain steroidal glycol-alkaloids including solamargine, *α*- and *β*-solanigrine. Contemporary pharmacological research has demonstrated that aqueous extracts of *Solanum nigrum* significantly reduce elevated cardiac serum markers (including troponin and CK-MB) in doxorubicin-induced cardiotoxicity models, with histological evidence of cardiomyocyte protection. The cardioprotective activity is attributed to its antioxidant and anti-inflammatory alkaloid and flavonoid content.[14]

3.3.2 *Chitraka:* *Chitraka* classified under *Deepaniya, Shoolaprashamana* and *Lekhaniya Gana* has *Katu Rasa, Ushna Virya, Sothahara* and *Krimighna* properties. The active principle plumbagin (5-hydroxy-2-methyl-1,4-naphthoquinone) has been extensively studied. Plumbagin demonstrates significant cardioprotective potential through inhibition of NF-κB and MAPK signalling pathways, reduction of inflammatory cytokines, and attenuation of oxidative stress. Its potent *Deepana* and *Sothahara* properties contribute to reducing the inflammatory burden on cardiac tissue. Additional constituents including isozeylinone, chitrantone, and *β*-sitosterol contribute to its cardio-metabolic efficacy.[15]

3.3.3 *Ardraka*: *Ardraka* is classified under *Deepaniya, Shulaprashamana,* and *Arshoghna Gana* of *Charaka Samhita*. Its *Karma* includes *Hrudya, Pachana, Bhedhana, Vrushya, Shulahara,* and *Vibhandhahara*, and its *Rogagnata* lists *Hridroga*. Pharmacologically, its bioactive constituents gingerols (particularly [6]-gingerol), shogaols, and paradols exert multi-mechanistic cardioprotection: antioxidant activity via scavenging of reactive oxygen species, anti-inflammatory action through COX-2 inhibition, anti-platelet activity, antihypertensive effects, and improvement of lipid profiles by reducing LDL cholesterol and triglycerides. Studies confirm its role in management of hypertension, obesity, atherosclerosis, and cardiac oxidative stress, validating its classical *Hridya* designation.[16]

3.3.4 *Jayanti*: *Jayanti* is classified under *Shimbi Kula*and its *Karma* includes *Mutrala, Vishagna, Deepana, Krimighna,* and *Shwitragna*. Contemporary research on *Sesbania grandiflora* (of the same genus) documents cardioprotective mechanisms including: scavenging of free radicals and prevention of lipid peroxidation through flavonoids and phenolic compounds; upregulation of endogenous antioxidant enzymes — glutathione peroxidase, catalase (CAT), and superoxide dismutase (SOD); suppression of reactive oxygen species (ROS) generation; and enhancement of endothelial nitric oxide synthase activity, thereby promoting nitric oxide production — a key vasodilatory and anti-inflammatory mediator that reduces vascular inflammation and cardiac injury.[17]

3.3.5 *Vasa*: *Vasa* is classified under *Guduchyadi Varga* of *Bhavaprakasha Nighantu* its *Karma* includes *Hridya, Shwasahara, Kasahara, Raktapittahara, Trishnashamaka, Kamalahara,* and *Mehahara*, with *Hridroga* listed prominently in its *Rogagnata*.Key chemical constituents include Vasicine and vasicinone are pharmacologically active bronchodilators. Kaempferol, a flavonoid, has documented cardioprotective properties through attenuation of oxidative stress, inhibition of myocardial apoptosis, and reduction of pro-inflammatory cytokines. The *Raktapittahara* and *Sheeta Veerya* properties of *Vasa* contribute to its anti-inflammatory effects.[18]

3.3.6 *Bilwa*: *Bilwa* is classified under *Shothahara, Arshogna Gana* of *Charaka* and *Brihatpanchamoola* of

Sushruta. The *Karma* of *Bilwa Kanda* includes *Hridya, Kasahara, Ruchya,* and *Agnivardaka*. Leaves contain rutin and marmesinin. Rutin is a well-characterised bioflavonoid with cardioprotective properties including: reduction of myocardial infarct size, inhibition of platelet aggregation, improvement in lipid profiles, and potent antioxidant activity reducing lipid peroxidation in cardiac tissue.

3.3.7 *Arjuna Twak*: *Arjuna* is classified under *Udaraprashamana Gana* of *Charaka* and *Nyagrodadi* of *Sushruta*. Its *Prabhava* is explicitly stated as *Hridya*, and *Hridroga* is its foremost classical indication. Its *Karma* includes *Hridya, Vranahara, Bhagna,* and *Raktapittahara*. *Rogagnata* encompasses *Hridroga, Medoroga, Prameha, Trshna, Bhagna, Urakshata, Kshaya,* and *Raktapitta*. The bark of *Terminalia arjuna* contains hydrolysable tannins (up to 15%), triterpenoid saponins, arjunolic acid, *β*-sitosterol, ellagic acid, arjunic acid, arjunine, arjunetinc acid, and minerals (calcium, aluminium, magnesium). Contemporary pharmacological research provides robust evidence for its cardioprotective mechanisms: flavonoids reverse endothelial dysfunction and reduce arterial pressure through vasorelaxation; tannins exert antioxidant activity against lipid peroxidation; saponins regulate platelet aggregation and lipid metabolism; and arjunolic acid demonstrates significant myocardial protective effects.[19]

3.4 Disease Review – *Hridroga* and Cardiovascular disease

The disease manifesting in *Hridaya* is termed as *Hridroga*.[20] *Aharaja Nidana* (Ati-*ushna, Guru, Ruksha, Ajeerana Ahara*); *Viharaja Nidana* (*Vega Vidharana*); *Manasika Nidana* (Bhaya, *Chinta*). *Nidana Sevana* leads to *Vatadi Dosha* vitiation causing *Dhatu Vikruti* and *Hridya Vikruti* finally presenting as *Hridroga*. *Samanya Lakshana* of *Hridroga* includes *Vaivarnya, Ruja, Pramoha, Trishna, Kasa Kaphotklesha, Chardi* and *Hikka.*

Cardiovascular diseases (CVDs) are a broad group of disorders affecting the heart and blood vessels. They encompass a wide spectrum of conditions ranging from structural heart defects to vascular diseases, many of which share common pathophysiological pathways including atherosclerosis, thrombosis, inflammation, and hemodynamic dysfunction.

Dosha disturbances and *Sroto Dushti* described in classical pathogenesis of *Hridroga* corresponds broadly to the mechanism of CVDs. *Shankara Vati* indicated in *Hridroga* thus addresses both the classical disease concept and its modern pathophysiological correlations.

DISCUSSION

The present literary review reveals the pharmacological importance of *Shankara Vati* referenced in *Hridroga-adhikara* of *Bhaishajya Kalpana*. The *Rasadravyas* in the formulation *Shankara Vati* namely *Kajjali* provides *Yogavahi* property; *Loha Bhasma* has *Lekhaniya, Rudhirakrit, Yogavahi Karma* which clears the *Srotorodha* and does *Raktha Dhatu Poshana*; *Naga Bhasma* has *Balya* and *Rasayana Karma* which strengthens the *Hridaya*. Among the *Bhavana Dravyas, Arjuna Twak Kwatha* represents the most extensively documented cardiac herb, with pharmacological evidence of endothelial protection, antioxidant activity, platelet regulation, and myocardial preservation. *Ardraka* and *Vasa* are independently classified as *Hridya* with explicit inclusion of *Hridroga* in their classical indications. *Kakamachi* has contemporary experimental evidence of direct cardioprotection in doxorubicin models. *Jayanti* demonstrates antioxidant enzyme upregulation (SOD, CAT, glutathione peroxidase) and nitric oxide pathway enhancement. *Bilwa Patra* and *Chitraka* contribute anti-inflammatory, antioxidant, and *Shothahara* properties that collectively reduce the inflammatory and oxidative stress burden on the myocardium. The formulation's classical indications *Hridroga, Jeerna-Jwara, Prameha, Kasa, Shwasa, Amavata,* and *Grahani* encompass a range of systemic metabolic and inflammatory conditions, many of which share pathophysiological links with cardiovascular risk.

CONCLUSION

Shankara Vati is a classically documented *Kharaliya Rasayana* with a well-established indication in *Hridroga*. The present literary review demonstrates that the cardioprotective rationale of the formulation is firmly grounded in the *Hridya* properties of each of its ingredients: *Dwiguna Kajjali*, *Loha Bhasma* and *Naga Bhasma* through classical *Hridroga* indications; and all seven *Bhavana Dravyas* namely *Arjuna Twak, Ardraka, Vasa, Kakamachi, Bilwa, Jayanti,* and *Chitraka* through independently documented *Hridya* activity and contemporary evidence of antioxidant, anti-inflammatory, and direct myocardial protective mechanisms.

The convergence of classical *Hridya Prabhava* across all constituent ingredients, combined with the pharmacological evidence for ROS attenuation, anti-inflammatory activity, and endothelial protection, provides strong justification for *Shankara Vati* as a rationally formulated cardioprotective action. Further in-vitro, in-vivo and clinical studies are recommended to comprehensively validate its therapeutic potential.

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