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HEART DISEASE IN AYURVEDA III : A HISTORICAL PERSPECTIVE

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ABSTRACT

Data on all aspects of diagnosis and treatment of heart disease was collected from Charaka Samhita, Sushruta Samhita, Ashtanga-sangraha, Ashtangahridaya, Chakradatta, Sharangadhara Samhita and Bhaishajyaratnavali which cover a period of nearly two thousand years. This communication reviews the historical aspects of the subject. Chronology and frequency distribution of the 229 single drugs used in the preparation of the 146 formulations identified from the survey are determined. The results are discussed and special mention is made of the areas of future research.

Introduction

The ancient Indian medical system of Ayurveda is based on a set of unique concepts. Basing on the six schools of Indian philosophy, Ayurveda maintains that the states of health and disease are influenced by three humours namely vāta, pitta and kapha collectively known as tridōṣa. Because of the wholistic approach to solve problems of health and disease, Ayurveda is able to offer guidelines for the diagnosis and treatment of many diseases for which Western medicine is yet to develop effective medicines devoid of adverse side-effects[1]. As a part of our studies on the scientific evaluation of ayurvedic medical literature[2-4], we undertook an extensive search of seven Sanskrit medical texts for cardiological information. Thirteen single drug remedies and 133 multi-component formulations indicated in heart disease were identified[5,6]. This communication treats the subject from the point of view of history of medicine. Attempt has also been made to determine the chronology and frequency-distribution of 229 single drugs used in the preparation of these formulations.

Agniveśa, the author of Caraka

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Saṁhitā flourished in the eighth century BC. The Saṁhitā of Suśruta is also believed to be equally time-honoured. Aṣṭāṅgahṛdaya and Aṣṭāṅgasaṅgraha are attributed to Vāgbhaṭa (600 AD), Cakradatta to Cakrapāṇidatta (1100 AD), Śārṅgadhara Saṁhitā to Śārṅgadhara (1300-1400 AD) and Bhaiṣajyaratnāvalī to Govindadāsa (1800 AD)[7-10]. While Caraka Saṁhitā, Suśruta Saṁhitā, Aṣṭāṅgasaṅgraha, and Aṣṭāṅgahṛdaya are treatises on the theory and practice of Ayurveda, Cakradatta and Bhaiṣajyaratnāvalī deal with the treatment of diseases only. Same is the case with Śārṅgadhara Saṁhitā which is the only authoritative text on ayurvedic pharmacy.

Materials and Methods

The seven texts were carefully examined in their entirety for infomation on all aspects of heart disease. Key words like hṛdrgoa, hṛdpīḍa, hṛdārti, hṛdgada (heart disease), hṛcchūla, hṛdruk (piercing pain in precordial region), hṛdgraha (seizing pain in precordial region) etc. were used for locating the relevant portions of the texts. After analysis and categorisation of the drug formulae, frequency-distribution of each constituent was determined. Ingredients of all formulations including their variants were subjected to study.

Results and Discussion

All the seven authors unanimously agree that heart disease is of five varieties viz., vātaja (vāta-dominant), pittaja (pitta-dominant), kaphaja (kapha-dominant), sannipātaja (due to combinations of the tridoṣa) and krimija (due to "worms"). However, the presentation of medical information shows interesting patterns in the seven texts. Caraka mainly presents the data on heart, disease in the trimarmīya chapter dealing with the three vital areas of the head, the heart and the pelvis[11]. Suśruta Saṁhitā describes heart disease in the hṛdroga pratiṣēdha chapter[12]. Aṣṭāṅgasaṅgraha and Aṣṭāṅgahṛdaya include heart disease in a chapter entitled chardihṛdrogatṛṣṇācikitsā (treatment of emesis, heart disease and thirst)[13,14]. Not withstanding, Cakradatta and Bhaisajyaratnāvalī contain chapters solely devoted to the treatment of the disease[15, 16].

Causes of heart disease

According to Ayurveda, heart and the alimentary tract are the central points where channels conducting the vital energy (prāṇa) converge. Heart and ten vessels are said to be the conduits for rasa, one of the seven dhātu (tissue elements) which constitute the human body[17]. Vitiation of these channels results in symptoms characteristic of diseases collectively known as hṛdroga (heart disease)[18,19].

Caraka and Suśruta state that symptoms of heart disease are manifested due to excessive indul-

gence in incompatible food, suppression of natural urges, physical and psychological trauma, fear and anxiety[11, 12]. Caraka further states in the chapter on treatment of rheumatic diseases (vātavyādhicikitsā) that vitiation of vāta in the alimentary tract, if untreated often leads to disorders of the heart[20]. Vāgbhaṭa on the other hand says that the same factors which cause gulma are responsible for causing heart disease [21-24]. Mādhavakara (800 AD), the author of the celebrated text Mādhavanidāna also gives similar opinion on the causative factors of the disease[25].

The influence of nutritional factors on the pathogenesis of heart disease is well-studied in Western medicine. It is documented that excessive consumption of fats and proteins eventually leads to obesity, occlusion and hardening of blood vessels and finally to heart disease[26]. Alcohol, a tīkṣṇa substance according to Ayurveda is proved to cause alcoholic myopathy in addition to its varied effects on the intermediary metabolism[27, 28].

Symptoms

Caraka considers paleness of body, fainting, fever, cough, hiccough, dyspepsia, thirst, nausea and anorexia as general symptoms of cardiac disorders. According to him vātaja heart disease is characterised by a feeling of emptiness and dryness of heart, pain in precordial area and fainting[11]. However Suśruta considers intense pain in precordial region to be an ominous symptom of the vātaja veriety[12]. Vāgbhaṭa also gives emphasis to excruciating pain in precordial area. Nevertheless, he opines that a wise physician should consider intolerance to sound, insomnia, fainting and depressed moods also as typical symptoms[20].

Burning sensation all over the body, thirst, fainting and the like are considered to be symptoms of pittaja heart disease[11, 12, 20]. However, Caraka and Vāgbhaṭa give importance to fever and discolourisation of body also.

Caraka, Suśruta and Vāgbhaṭa unanimously agree that discomfort in precordial region and increased salivation are the heralding signs of kaphaja heart disease [11, 12, 20]. Interestingly, anorexia, dyspepsia, hypersomnia, heaviness in head, fever, cough etc. are also mentioned.

A combination of symptoms of the three major groups is said to be observed in the sannipātaja variety. Though the Sanskrit word krimi literally denotes a worm[29], descriptions available in ayurvedic literature suggest that the word also connotes a subtle pathogen[30, 31]. Thus krimi hṛdroga may be the ayurvedic counterpart of infective endocarditis described in Western medicine[32].

Conditioning of patients prior to therapy

Pre-conditioning of patients prior to drug treatment was not a subject of much discussion in ayurvedic texts anterior to Cakradatta. Starvation, purgation, induced emesis and smearing of pastes of appropriate drugs are usually recommended by Cakrapāṇi and Govindadāsa. In the case of krimi hṛdroga, the patient is fed with goghṛta and meat for three days followed by purgation[15], [16].

Govindadasa gives clear instructions on dietetics of heart patients. Grains of *Oryza sativa* L. (with red bran and endosperm), seeds of *Phaseolus mungo* L., fruits of *Mangifera indica* L., *Momordica charantia* L., *Musa paradisiaca* L., *Punica granatum* L., and *Trichosanthes dioica* Roxb., fresh buttermilk and meat of herbivores inhabiting grasslands or forests are some of the prescribed foods. Food possessing qualities similar to those of the humour (s) in question are strictly prohibited[16].

Ayurvedic practitioners belonging to the traditional school of thought are of the opinion that for achieving excellence in clinical practice a student of the system should study carefully the axioms detailed in the section on fundamental principles (sūtrasthāna) of every classical text and delve into their deeper meanings. Caraka advises that even in the absence of the name of the disease manifested in an individual, detailed information on the humoural imbalance is sufficient to choose the correct line of treatment[33]. A practitioner is therefore expected to extrapolate the axioms in the sūrasthāna and discover their usefulness in diagnosis and therapeutics. This may explain the paucity of information in the four classical texts on pre-treatment and dietetics of heart patients.

History of medicinal formulations

Details of the 13 single drug remedies and 133 multicomponent formulations identified in the present survey are presented elsewhere[5],[6]. The 146 medicinal formulations involve 203 plants distributed in 69 families, 6 substances of animal origin, 5 inorganic compounds, 7 metals and 8 salts or ashes. As far as the multicomponent formulations are concerned, Caraka Saṁhitā contains 53, Suśruta Saṁhitā 8, Aṣṭāṅgahṛdaya 40, Aṣṭāṅgasaṅgraha 47, Cakradatta 49, Śārṅgadhara Saṁhitā 17 and Bhaiṣajyaratnāvalī 36 formulae. Interestingly enough, Cakradatta is found to contain the maximum number of single drug formulae (9), many of them innovative, followed by Bhaiṣajyaratnāvalī (8). Suśruta Saṁhitā is singular by the absence of any single drug formulae for heart disease.

Frequency distribution of the 229

constituent drugs of the 146 formulations is presented in Table 1, which reveals interesting information. For example, *Zingiber officinale* (91, 68.42%) and *Piper longum* (91, 68.42%) are the two drugs having maximum incidence in recipes. These are followed by *Piper nigrum* (61, 45.86%), *Plumbago zeylanica* (58, 43.60%), *Terminalia chebula* (57, 42.85%), *Emblica officinalis* (49, 36.84%) and *Terminalia bellirica* (35, 26.31%).

Piper longum, *Piper nigrum* and *Zingiber officinale* form the famous trikaṭu group of drugs. It is now clear beyond doubt that one of the functions of the trikaṭu drugs is to increase the bioavailability of other drugs[34-36]. This is astonishingly in agreement with Caraka's statement made nearly two thousand years ago that *Piper longum* intensifies the action of drugs to which it is added[37]. Stimulation of digestive processes and dissolution of toxic substances produced due to impaired digestion (āma) are also the other possible modes of action of the trikaṭu drugs. This is more striking especially in the wake of the ayurvedic axiom that pathology of the srotas (minute channels) is the fundamental cause of heart disease[17]. The important position of *Zingiber officinale* in ayurvedic pharmacopoeia is highlighted by the fact that a proverb extolling its medicinal value is still in vogue in Kannada, Malayalam, Tamil and Telugu languages[38].

Emblica officinalis, *Terminalia bellirica* and *Terminalia chebula* make the time-honoured ayurvedic rejuvenator Triphala, a minor variant of which is recommended by Suśruta for heart disease[5]. According to ayurvedic literature the three ingredients have a variety of actions, the most important one being the clearing of srotas[39]. Pharmacological information on these plants indicate that they have choleretic, cholagogic, hypolipidemic, anti-necrotic, hypotensive and coronary vasodilatory properties[40-44]. *Plumbago zeylanica* is carminative and antimicrobial[39]. Modern studies show that it normalises intestinal flora[45].

Curcuma aromatica and *Croton tiglium* are two of the minor ingredients which seem to have been accepted from other systems notably the Tamil, Greco-Arabic and Chinese medicines. Similarly many drugs of inorganic and animal origin made their appearance in cardioactive formulations of post-Vāgbhaṭa period obviously due to interaction with Tamil medicine. This is evidenced by Govindadāsa's treatment of the subject. Enrichment of the ayurvedic formulary with the introduction of such drugs during the medieval period points towards the dynamic state of Ayurveda as suggested by Meulenbeld[9].

Taking into consideration the volume of information on heart

disease, it can be said with certainty that the earlier authors of Ayurveda were familiar with the disease and the formulations useful in its treatment. For example, though described in widely-separated sections like the sūtrasthāna, vimānasthāna (section on specialised groupings of factors), and cikitsāsthāna (section on therapeutics), the Caraka Saṁhitā contains the maximum information on aetiology, nosology and therapeutics of heart disease. However, by the 11 century AD there seems to have emerged the need to deal with the disease in a more organised manner. This explains the highly systematised presentation of cardiological literature by Cakrapāṇidatta and the introduction of *Inula racemosa*, *Moringa oleifera*, *Ricinus communis*, *Terminalia arjuna* etc. as specific single drug remedies for heart disease. Continued wars and political instability which affected medieval Indian society must have necessitated such efforts.

Conclusions

This survey shows that unanimity exists among the various authors of ayurvedic classics on the aetiology, nosology and therapeutics of heart disease. Careful examination of their opinions shows that obstruction of the srotas (srotorodha) is the fundamental cause of heart disease. The emphasis laid by Ayurveda on the need to regulate digestive physiology sounds rational on the basis of the argument that all diseases spring from impaired digestion. Interestingly enough, one of the synonyms of the word "disease" is āmaya, which means that which originates from āma[46]. The wide-spectrum nature of the drug formulations identified from this survey is also explainable in this way.

Evidences from Western medical literature[47] suggest that the four major types of heart disease described in ayurvedic literature may be groups of known cardiac ailments and syndromes, krimija hṛdroga being comparable to infective endocarditis. In the backdrop of ayurvedic theory it is also possible to speculate that kaphaja hṛdroga in course of time may get transformed into the vātaja variety. However, well-controlled comparative clinical studies are essential to clarify these points. It is needless to state that in order to do justice to the subject, patients may be examined separately according to the diagnostic procedures of both the systems, while keeping treatment protocol exclusively on ayurvedic lines. It is also essential to pay due attention to the several variables which if overlooked, will certainly increase the "noise" in the clinical data[48]. Western diagnostic parameters can be used for evaluating the success of treatment and comparing the nosological details.

During the course of this survey

it was observed that in addition to the specific formulations prescribed in the sections on therapeutics of heart disease, almost every other chapter of a text contained some useful data or formula which included heart disease among its many indications. For example, Suśruta states in the chapter on the aetiology of pramēha (urinary disorders of polyuric nature) that heart disease can be its secondary affliction[49]. Moreover, in the chapters on the classification of vidradhi (abscess) Suśruta and Vāgbhaṭa describe hṛdayavidradhi[50], [51]. It will be rewarding to ascertain whether the disease has any semblance with the various tumours of the heart described in Western medicine[52]. It is therefore evident that a text needs to be surveyed in its entirety for gathering information on a specific point.

Ayurveda has always remained dynamic in the course of its peregrination through the ages. Accordingly, many new plants introduced into the country through various routes were well-incorporated into the system without sacrificing its tenets. Bhāvamiśra's monumental work bears testimony to this[53]. This was achieved obviously by understanding the rasa (taste), guṇa (qualitiy), vīrya (potency), vipāka (post-transformational taste) and prabhāva (specific action) of these drugs. Such a feat can be achieved in modern times as well so as to enrich the ayurvedic pharmacopoeia. The technological advances made by Western medicine and biomedical sciences can become handy tools for achieving this goal. This obviates the importance of studies on the utility of the tridoṣa doctrine in the diagnosis and treatment of diseases. Preliminary attempts show that this is not an insurmountable task[54]. Though a wealth of information is available in Ayurveda on heart disease, cardiology is a highly neglected area in contemporary ayurvedic practice. However, the situation can be vastly improved by adopting a multi-disciplinary approach to the problem. It is hoped that this study serves as a harbinger of the much-needed change.

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TABLE 1

FREQUENCY-DISTRIBUTION OF THE INGREDIENTS OF THE CARDIOACTIVE FORMULATIONS

Ingredient	Sanskrit name	Official part	Incidence in recipes (preference of authors)*
(1)	(2)	(3)	(4)
I Vegetable Drugs			
Acanthaceae			
1) *Adhatoda vasica* Nees.	Vāsā	root	7 (S1, CS5, A2, C3, Sa1, B2)
2) *Andrographis paniculata* (Burm. f.) Wall. ex Nees.	Kirātatikta	root	5 (CS1, A5)
3) *Barleria prionitis* L.	Sairīyā	root	1 (A1)
Amaranthaceae			
4) *Achyranthes aspera* L.	Apāmārga	root	1 (S1, CS1, A1)
5) *Aerva lanata* (L.) Juss.	Bhadra	root	1 (A1)
6) *Cyathula prostrata* (L). Bl.	Kṣudrāpamārga	root entire	2 (C1, B2)
Anacardiaceae			
7) *Buchanania lanzan* Spreng.	Priyāḷa	seed bark	2 (A1, C1)
8) *Rhus succedanea* L.	Karkaṭaśṛṇgi	gall	8 (CS3, A4, C2, B1)
9) *Semecarpus anacardium* L. F.	Bhallātaka	seed	5 (CS2, A4, C2)
Apocynaceae			
10) *Alstonia scholaris* (L.) R. Br.	Saptaparṇa	bark	2 (S1, CS1, A1, C1, Sa1)

(1)	(2)	(3)	(4)
11) *Holarrhena antidysenterica* (Roth.) Wall. ex DC.	Kuṭaja	bark,seed entire	14 (S2, CS4, A5, C8, Sa3, B1)
12) *Ichnocarpus frutescens* (L.) R. Br.	Kṛṣṇasārivā	root	2 (S1, CS2, C1, Sa1)
Araceae			
13) *Acorus calamus* L.	Vacā	rhizome	31 (S3, CS13, A14, C13, Sa4, B13)
14) *Alocasia indica* Schott.	Mānaka	tuber	1 (B1)
15) *Scindapsus officinalis* Schott.	Gajapippalī	fruit	15 (S1, CS3, A7, C6 Sa1, B4)
Asclepiadaceae			
16) *Calotropis gigantea* (L.) R. Br. ex Ait.	Arka	root,latex entire	4 (CS1, A2, C1, B2)
17) *Hemidesmus indicus* Br.	Sārivā	root	2 (S1, CS2, C1, Sa1)
18) *Holostemma annulare* (Roxb.) K. Schum.	Jīvantī	root	9 (CS6, A8, C5, B2)
Berberidaceae			
19) *Berberis aristata* DC.	Dāruharidrā	root-bark	15 (S1, CS3, A5, C6, Sa3, B2)
Bignoniaceae			
20) *Bignonia colais* (Buch. Ham. ex Dillw.) Mabberley.	Pāṭalā	root	10 (S1, CS5, A5, C7, Sa1, B2)
21) *Oroxylum indicum* (L) Vent.	Śyonāka	root	10 (S1, CS5, A4, C7, Sa1, B2)
Boraginaceae			
22) *Heliotropium indicum* L.	Hastiśuṇḍa	entire	1 (B1)

(1)	(2)	(3)	(4)
23) *Trichodesma indicum* R. Br.	Avākapuṣpi	root	1 (A1)
Burseraceae			
24) *Commiphora mukul* (Hook. ex Stocks.) Engl.	Guggulu	gum-resin	3 (A1, C3)
Caesalpiniaceae			
25) *Cassia absus* L.	Prapouṇḍarīka	seed	1 (CS1, A1)
26) *Cassia fistula* L.	Āragvadha	bark	1 (S1, CS1, C1, Sa1)
27) *Tamarindus indicus* L.	Amlikā	fruit, root-bark	9 (S1, CS2, A4. C4, Sa5, B5)
Capparidaceae			
28) *Crataev religiosa* Forst.	Varuṇa	entire	1 (A1, B1)
Combretaceae			
29) *Terminalia arjuna* (Roxb.) Wight & Arn.	Arjuna	bark	17 (CS1, C6, B15)
30) *Terminalia bellirica* (Gaertn.) Roxb.	Vibhītaka	fruit	35 (S1, CS12, A12, C13, Sa8, B8)
31) *Terminalia chebula* (Gaertn.) Retz.	Harītakī	fruit	57 (S7, CS22, A23, C22, Sa11, B23)
Compositae			
32) *Centratherum anthelminticum* (Willd.) Kuntze.	Somarājī	seed	1 (B1)
33) *Inula racemosa* Hook. f.	Puṣkaramūla	root	33 (S3, CS14, A14, C17, Sa5, B16)
34) *Saussurea lappa* Clark.	Kuṣṭha	root	13 (CS5, A6, C7, Sa1, B5)
35) *Sphaeranthus indicus* L.	Mahāśrāvaṇi	root	11 (S1, CS4, A5, C7, Sa3, B6)

(1)	(2)	(3)	(4)
36) *Vernonia cineria* (L.) Less.	Daṇḍotpala	root	1 (B1)
Convulvulaceae			
37) *Argyreia speciosa* Sweet	Vṛddhadāru	root	2 (C2, B1)
38) *Ipomoea paniculata* R. Br.	Vidārī	root	4 (CS3, A1, C1)
39) *Ipomoea pes-tigridis* L.	Vyāghranakhi	root	1 (A1)
40) *Operculina turpethum* (L) S. Manso	Tṛvṛt	entire	11 (CS4, A5, C4, Sa3, B6)
Cruciferae			
41) *Brassica juncea* (L.) Czern. & Coss.	Āsuri	seed	1 (C1)
42) *Raphanus sativus* L.	Mūlaka	root	4 (CS2, A1, Sa1, B1)
Cucurbitaceae			
43) *Benincasa cerifera* Savi	Kūśmāṇḍa	fruit	3 (C3)
44) *Citrullus colocynthis* Schrad.	Indravāruṇī	root	12 (S2, CS6. A4, C4, Sa3, B4)
45) *Luffa acutangula* Linn. Roxb.	Kōṣātakī	root,entire	2 (A1, B1)
46) *Luffa aegyptica* Mill.	Dāhmārgava	entire	1 (B1)
47) *Solena heterophylla* Lour.	Amlavetasa	root	14 (S1, CS4, A4, C6, Sa7, B5)
48) *Trichosanthes bracteata* (Lamk.) Voight.	Mahākala	root	2 (CS1, A1)
49) *Trichosanthes cucumerina* L.	Paṭola	leaf, stem, root	14 (S1, CS2. A9, C5, Sa2)
Cyperaceae			
50) *Cyperus rotundus* L.	Mustā	tuber	31 (CS11, A13, C10, Sa6, B5)
51) *Scripus kysoor* Roxb.	Kaśeruka	tuber	3 (CS3)

(1)	(2)	(3)	(4)
Ebenaceae			
52) *Diospyros peregrina* (Gaertn.) Gurke	Tinduka	fruit	1 (CS1)
Euphorbiaceae			
53) *Baliospermum montanum* (Willd.) Muell. & Arg.	Nāgadantī	root	9 (S1, CS3, A4, C3, Sa3, B5)
54) *Croton tiglium* L.	Jayapāla	seed	1 (B1)
55) *Emblica officinalis* Gaertn.	Āmalakī	fruit	49 (S4, CS22, A19, C19, Sa8, B10)
56) *Euphorbia neriifolia* L.	Sudhā	root,stem, entire	3 (CS1, A1, C1, B2)
57) *Euphorbia tirucalli* L.	Tṛkaṇṭaka	latex	1 (CS1, A1, C1, B1)
58) *Homonoia riparia* Lour.	Pāṣāṇabheda	root	1 (C1, Sa1, B1)
59) *Phyllanthus niruri* L.	Tāmalakī	entire	8 (CS6, A6, C1, B1,)
60) *Ricinus communis* L. white variety	Eraṇḍa	root	3 (C2, Sa2, B3)
61) *Tragia involucrata* L.	Vṛścikālī	root	15 (S1, CS5, A4, C6, Sa2, B3)
Ficoidaceae			
62) *Mollugo cerviana* Ser.	Parpaṭaka	entire	7 (S1, CS2, A5, C1, Sa2)
Gramineae			
63) *Cymbopogon schoenanthus* (L.) Spreng.	Kattṛṇa	entire	2 (CS2, A1, B1)
64) *Desmostachya bipinnata* Stapf.	Darbha	root	1 (CS1, A1, C1, B1)
65) *Hordeum vulgare* L.	Yava	grain	6 (S3, CS3, A4, C2, B2)

(1)	(2)	(3)	(4)
66) *Saccharum arundinaceum* Retz.	Muñja	root	1 (B1)
67) *Triticum aestivum* L.	Godhūma	grain	1 (CS1, A1, C1, B1)
68) *Vetiveria zizanioides* (L.) Nash.	Uśīra	root	10 (S1, CS4, A6, C3, Sa3, B1)
Guttiferae			
69) *Calophyllum apetalum* Willd.	Tejovatī	seed	3 (CS1, A3, C2)
70) *Garcinia indica* Choisy.	Vṛkṣāmla	fruit	4 (A4)
71) *Mesua ferrea* L.	Nāgakeśara	flower	13 (CS5, A4, C5, Sa5, B2)
Haemodoraceae			
72) *Sansevieria roxburghiana* Schult.	Mūrvā	root	6 (S1, CS3, A2, C1, Sa2, B1)
Labiatae			
73) *Coleus vettiveroides* Jacob	Hrīvera	root	5 (CS2, C1, Sa2, B1)
74) *Ocimum sanctum* L.	Tulasi	root	2 (CS1, A1)
Lauraceae			
75) *Cinnamomum camphora* (L.) Nees & Eberm.	Karpūra	entire	1 (Sa1)
76) *Cinnamomum tamala* Nees & Eberm.	Patra	leaf	20 (CS6, A8, C8, Sa5, B2)
77) *Cinnamomum verum* J.S.Presl.	Tvak	bark	26 (CS10, A13, C10, Sa7, B2)
78) *Litsea polyantha* Juss.	Meda	bark	11 (CS6, A5, C3, B3)

(1)	(2)	(3)	(4)
Lecythridaceae			
79) *Barringtonia acutangula* (L.) Gaertn.	Nicula	root, bark	2 (A1, B1)
Liliaceae			
80) *Allium sativum* L.	Laśuna	bulb	1 (CS1, A2, C1, B1)
81) *Asparagus racemosus* Willd.	Śatāvarī	root	11 (S1, CS6, A3, C5, Sa2, B2)
82) *Fritillaria roylei* Hook.	Kṣīrakākōli	bulb	7 (CS3, A2, C2, B2,)
83) *Lilium polyphyllum* D. Don	Kākolī	bulb	8 (CS3, A3, C2, Sa1, B2)
84) *Polygonatum cirrhifolium* Royle.	Mahāmeda	bulb	7 (CS2, A3, C2, B3)
Lythraceae			
85) *Woodfordia fruticosa* Kurz.	Dhātakī	flower	3 (CS1, A1, Sa1, B1)
Malvaceae			
86) *Sida cordifolia* L.	Balā	root	14 (S1, CS7, A8, C6, Sa1, B5)
87) *Sida rhombifolia* L.	Atibalā	root	5 (CS3, A1, C4, B3)
Marantaceae			
88) *Maranta arundinacea* L.	Tugākṣīrī	starch	11 (CS3, A2, C3, Sa2, B3)
Meliaceae			
89) *Aglaia roxburghiana* Miq.	Priyaṅgu	flower	2 (CS2)
90) *Aphanamixis polystachya* (Wall.) Parker	Rohitaka	barK	3 (CS1, A1, C1, Sa1, B1)
91) *Azadirachta indica* A. Juss	Nimba.	bark, seed	14 (S1, CS4, A8, C4, Sa2, B3)

(1)	(2)	(3)	(4)
92) *Chukrasia tabularis* A. Juss.	Aguru	heartwood	1 (A1)
Menispermiaceae			
93) *Cissampelos pareira* L.	Pāṭhā	root	21 (S3, CS10, A7, C7, Sa3, B4)
94) *Tinospora cordifolia* (Willd.) Miers. ex Hook. f. & Thomas.	Guḍūcī	stem	13 (S1, CS6, A3, S8, Sa2)
Mimosaceae			
95) *Acacia catechu* Willd.	Khadira	heartwood	2 (CS1, A1, Sa1)
96) *Acacia concinna* DC.	Sātala	entire	2 (CS1, A1, C1,
97) *Acacia leucophloea* Willd.	Arimeda	bark	1 (C1)
98) *Acacia polyantha* Willd.	Somavalka	bark	1 (A1)
99) *Albizzia procera* (Roxb.) Benth.	Kaṭabhi	bark	2 (CS1, Sa1)
Moraceae			
100) *Ficus benghalensis* L.	Vaṭa	bark	1 (CS1, A1)
101) *Ficus racemosa* L.	Udumbara	bark	1 (CS1, A1)
102) *Ficus religiosa* L.	Aśvattha	bark	1 (CS1, A1)
Moringaceae			
103) *Moringa oleifera* Lam.	Śigru	bark, fruit, seed	6 (CS2, A4, C2, Sa2, B1)
Myristicaceae			
104) *Myristica fragrans* Houtt.	Jātiphala	aril	2 (Sa)
Myrsinaceae			
105) *Embelia ribes* Burm. f.	Viḍaṅga	seed	29 (S1, CS9, A7, C10, Sa7, B9)

(1)	(2)	(3)	(4)
Myrtaceae			
106) *Syzygium aromaticum* (L.) Merr. & L.M. Perry	Lavaṅga	flowerbud	3 (Sa3)
Nyctaginaceae			
107) *Boerhaavia diffusa* L.	Rakta Punarnavā	root,entire	9 (CS4, A3, C2, B3)
Nymphaceae			
108) *Nelumbo nucifera* Gaertn.	Padma	fruit-torus	4 (CS2, A2, A1, C1, Sa1, B1)
109) *Nymphaea stellata* Willd.	Nīlotpala	root-stock	5 (CS5, A1, Sa1, B1)
Onagraceae			
110) *Trapa bispinosa* Roxb.	Śṛṅgāṭaka	fruit	1 (CS1, A1)
Orchidaceae			
111) *Habenaria intermedia* D. Don.	Ṛddhi Vṛddhi	entire	8 (CS5, A6, C5, B4)
112) *Microstylus muscifera* Ridl.	Jīvaka	entire	10 (CS5, A5, C2, Sa1, B1)
113) *Microstylus wallichii* Lindl.	Ṛṣabhaka	entire	7 (CS5, A5, C3, Sa1, B2)
Oxalidaceae			
114) *Oxalis corniculata* L.	Cāṅgerī	entire	1 (CS1)
Palmae			
115) *Areca catechu* L.	Kramuka	root, fruit	3 (CS3, A1)
116) *Borassus flabellifer* L.	Tāla	root	1 (B1)
117) *Cocos nucifera* L.	Nālīkera	seed	1 (C1, B1)
118) *Phoenix dactylifera* L.	Kharjūra	fruit	2 (CS1, A2)
119) *Phoenix pusilla* Gaertn.	Sallaki	root	3 (CS2, C1, B1)

(1)	(2)	(3)	(4)
Papillionaceae			
120) *Butea monosperma* (Lam.) Kuntze	Palāśa	bark, seed, entire	6 (CS4, A4, C2, B2)
121) *Cajanus indicus* Spreng.	Āḍhakī	seed	1 (B1)
122) *Clitoria ternatea* L.	Śaṅkhapuṣpī	root	1 (S1, CS1, A1, C1)
123) *Desmodium gangeticum* (L.) DC.	Śāliparṇī	root	21 (S1, CS10, A10, C10, Sa2, B4)
124) *Dolichos biflorus* L.	Kulattha	seed	3 (CS1, A1, Sa1, B1)
125) *Erythrina variegata* L. var. orientalis L.	Mandāra	bark, entire	2 (CS1, B1)
126) *Glycyrrhiza glabra* L.	Yaṣṭīmadhu	root	18 (S1, CS9, A10, C7, Sa2, B4)
127) *Indigofera tinctoria* L.	Nīlī	root	1 (B1)
128) *Lens culinaris* Medic.	Masūra	seed	1 (A1)
129) *Mucuna prurita* Hook.	Ātmaguptā	root, seed	6 (S1, CS6, A4, C2, B1)
130) *Pongamia pinnata* (L.) Pierre	Karañja	bark	2 (A1, C1)
131) *Pseudarthria viscida* (L.) W & A	Pṛśniparṇī	root	16 (S1, CS8, A7, C9 Sa2, B5)
132) *Psoralea corylifolia* L.	Bākucī	seed	1 (Sa1)
133) *Pterocarpus marsupium* Roxb.	Asana	heartwood	2 (A2)
134) *Pterocarpus santalinus* L.	Raktacandana	heartwood	2 (A1,C1)
135) *Tephrosia purpurea* (L.) Pers.	Śarapuṅkhā	root	1 (B1)
136) *Teramnus labialis* Spreng.	Māṣaparṇī	root	1 (CS1)

(1)	(2)	(3)	(4)
Pinaceae			
137) *Abies webbiana* Lindl.	Tālīsa	leaf	8 (CS2, A3, C7, Sa3, B1)
138) *Cedrus deodara* Hook. f.	Devadāru	heartwood	21 (CS8, A7, C4, Sa4, B4)
139) *Pinus longifolia* Roxb.	Sarala	heartwood	1 (CS1, A1)
Piperaceae			
140) *Piper chaba* Hunter	Cavya	root	30 (S1, CS10, A7, C10, Sa4, B9)
141) *Piper cubeba* Linn. f.	Kakkola	fruit	2 (Sa2)
142) *Piper longum* L.	Pippalī	fruit	91 (S6, CS37 A39, C38, Sa14, B25)
143) *Piper nigrum* L.	Marica	fruit	61 (S4, CS21, A23, C26, Sa10, B17)
144) *Piper wallichii* Hand.-Mazz.	Reṇuka	fruit	2 (CS1, B1)
Plumbaginaceae			
145) *Plumbago zeylanica* L.	Citraka	root,entire	58 (S3, CS23, A21, C20, Sa9, B20)
Punicaceae			
146) *Punica granatum* L.	Dāḍima	fruit, seed	18 (S1, CS8, A7, C7, Sa7, B9)
Ranunculaceae			
147) *Aconitum chasmanthum* Stapf. ex Holmes	Vatsanābha	root	1 (A1)
148) *Aconitum heterophyllum* Wall.	Ativiṣā	root	12 (S1, CS5, A6, C5, Sa2, B1)
149) *Nigella sativa* L.	Sthūlajīraka	seed	4 (CS1, A1, Sa2)

(1)	(2)	(3)	(4)
Rhamnaceae			
150) *Zizyphus jujuba* L.	Badarī	fruit, seed	8 (CS4, A4, C2, Sa4, B1)
Rosaceae			
151) *Prunus cerasus* L.	Elāvāluka	fruit	6 (S1, CS3, A2, C1)
152) *Prunus puddum* Roxb.	Padmaka	bark	4 (S1, CS2, A2, C2, Sa2)
Rubiaceae			
153) *Gardenia lucida* Roxb.	Hiṅgupatrī	leaf	1 (Sa1)
154) *Randia dumetorum* Lamk.	Madanaphala	fruit	1 (A1)
155) *Rubia cordifolia* L.	Mañjiṣṭhā	stem	7 (CS3 A3, C2, Sa1, B1)
156) *Spermacoce hispida* L.	Vasuka	entire	1 (B1)
Rutaceae			
157) *Aegle marmelos* (L.) Corr.	Bilva	root,unripe fruit,entire	19 (S1, CS8, A8, C11, Sa2, B5)
158) *Citrus decumana* L.	Mātuluṅga	root, fruit	7 (CS1, C4, B3)
159) *Citrus medica* L. var. *Limonum*	Bijapūraka	root, fruit	4 (C1, Sa1, B2)
160) *Feronia limonia* (L.) Swingle	Kapittha	fruit, bark	3 (S1, CS2, A1)
161) *Zanthoxylum alatum* Roxb.	Tumburu	seed	8 (A2, C3, Sa1, B2)
Santalaceae			
162) *Santalum album* L.	Candana	heart wood	8 (S1, CS3, A4, C2, Sa3, B1)

(1)	(2)	(3)	(4)
Sapotaceae			
163) *Madhuca longifolia* (Koenig) Macbride	Madhūka	flower,	3 (A3, B1)
Scrophulariaceae			
164) *Bacopa monniera* (L.) Wettst.	Brāhmī	entire	9 (S1, CS4, A6, C2, Sa2, B1)
165) *Limnophila gratissima* Bl.	Āmragandhika	entire	1 (CS1)
166) *Picrorhiza kurroa* Royle ex Benth.	Kaṭurohiṇī	root	19 (S1, CS7, A9, C10, Sa2, B1)
Solanaceae			
167) *Hyoscyamus niger* L.	Pārasikayavānī	leaf	14 (CS2, A4, C8, Sa5, B7)
168) *Solanum ferox* L.	Bṛhatī	root,entire	16 (S1, CS6, A6, C10, Sa2, B6)
169) *Solanum indicum* L.	Bṛhatī	root, fruit	25 (S1, CS11, A10, C12, Sa3, B6)
170) *Solanum melongena* L.	Vṛntāka	fruit	1 (C1)
171) *Solanum nigrum* L.	Kākamācī	root	1 (A1, B1)
172) *Solanum torvum* Swartz.	Vṛntāka	fruit	1 (A1)
173) *Solanum violaceum* Ortega	Tikta	root	5 (S1, CS2, C4, Sa2)
174) *Solanum xanthocarpum* Sch. & Wendl.	Vyāghrī	root	4 (A2, C1, Sa1)
175) *Withania somnifera* Dunal	Aśvagandhā	root	1 (A1, C1, Sa1)
Symplocaceae			
176) *Symplocos racemosa* Roxb.	Lodhra	bark	4 (S1, CS3, A1)

(1)	(2)	(3)	(4)
Thymelaceae			
177) *Aquilaria agallocha* Roxb. *Ulmaceae*	Kṛṣṇāgaru	heartwood	1 (Sa1)
178) *Holoptelia integrifolia* (Roxb) Planch. *Umbelliferae*	Pūtikarañja	bark,entire	2 (CS1, A1, C1)
179) *Carum carvi* L.	Kṛṣṇajīraka	fruit	13 (CS2, A3, C5, Sa4, B8)
180) *Coriandrum sativum* L.	Kustumburu	seed	19 (S2, CS6, A9, C11, Sa8, B6)
181) *Cuminum cyminum* L.	Jīraka	fruit	27 (S1, CS8, A9, C14, Sa8, B11)
182) *Ferula foetida* Regel	Hiṅgu	gum-resin	26 (S3, CS8, A14, C12, Sa5, B12)
183) *Heracleum rigens* Wall.	Sūkṣmela	seed	3 (CS3, A2, C1, B2)
184) *Peucedanum grande* C B. Clarke	Ajagandhā	root	5 (S1, CS3, A2, C2, Sa2, B2)
185) *Peucedanum graveolens* L.	Śatakusuma	root,entire	9 (CS1, A4, C6, Sa2, B5)
186) *Trachyspermum ammi* (L.) Sprague *Valerianaceae*	Ajamodā	fruit	28 (S2, CS8, A8, C13, Sa5 B12)
187) *Nardostachys jatamansi* DC.	Jaṭāmāṁsī	root	2 (A1, Sa1)
188) *Valeriana hardwickii* Wall. *Verbenaceae*	Tagara	root	3 (A1, Sa2)
189) *Clerodendrum serratum* (L.) Moon	Bhārṅgī	root	16 (S1, CS4, A8, C6, Sa2, B1)

(1)	(2)	(3)	(4)
190) *Gmelina arborea* L.	Kāśmarī	root, fruit	17 (S1, CS9, A6, C9, Sa1, B5)
191) *Lippia nodiflora* Mich.	Vanapippalī	root	31 (S2, CS12, A12, C12, Sa6, B2)
192) *Premna herbacea* Roxb.	Agnimantha	root,entire	11 (S1, CS5, A4, C7, Sa1, B3)
193) *Vitex negundo* L. *Vitaceae*	Nirguṇḍī	root	2 (A1, B1)
194) *Vitis vinifera* L. *Zingiberaceae*	Drākṣā	fruit	15 (CS9, A9, C3, B3)
195) *Alpinia galanga* (L.) Willd.	Elāparṇī	rhizome	17 (CS8, A6, C4, B6)
196) *Amomum subulatum* Roxb.	Bṛhadēlā	seed	2 (Sa1, B1)
197) *Curcuma aromatica* Salisb.	Āmragandha-haridrā	rhizome	1 (A1)
198) *Curcuma longa* Roxb.	Haridrā	rhizome	13 (S2, CS4, A3, C7, Sa2, B2)
199) *Elettaria cardamomum* (L.) Maton	Elā	seed	27 (S1, CS8, A14, C12, Sa4, B2)
200) *Kaempferia galanga* L.	Śaḍḍhi	tuber	31 (S2, CS16, A13, C10, Sa6, B19)
201) *Kaempferia rotunda* L.	Bhūcampaka	tuber	3 (A2, C2, B1)
202) *Zingiber officinale* Rosc. *Zygophyllaceae*	Śuṇṭhī	rhizome	91 (S3, CS34, A41, C41, Sa13, B32)
203) *Tribulus terrestris* L.	Gokṣura	fruit,entire	19 (S1, CS10, A7, C11, Sa2, B7)

(1)	(2)	(3)	(4)
II Animal Drugs			
204) Conch shell	Śaṅkha	.....	2 (B2)
205) Coral	Pravāla	.....	1 (B1)
206) Deer horn	Mṛgaśṛṅga	.....	3 (C1, Sa1, B1)
207) Oyster shell	Kapardikā	.....	1 (B1)
208) Pearl	Muktā	.....	1 (B1)
209) Pearl oyster shell	Śukti	.....	1 (B1)
III Inorganic Substances			
210) Chalk of reddish brown colour	Gairika	.....	3 (CS1, A1, C1, Sa1)
211) Iron pyrites	Suvarṇamākṣika	.....	1 (B1)
212) Mica	Abhraka	.....	5 (B5)
213) Mineral bitumen	Śilājatu	.....	2 (CS1, A2, B2)
214) Sulphur	Gandhaka	.....	2 (B2)
IV Metals			
215) Copper	Tāmra	.....	2 (B2)
216) Gold	Suvarṇa	.....	1 (B1)
217) Iron	Loha	.....	7 (A1, C1, Sa2, B6)
218) Lead	Nāga	.....	1 (B1)
219) Mercury	Rasa	.....	3 (B3)

(1)	(2)	(3)	(4)
220) Silver	Rajata	.....	1 (B1)
221) Tin	Vaṅga	.....	1 (B1)
V Salts and Ashes			
222) Common salt	Sāmudra	.....	9 (CS4, A4, C5, Sa5)
223) Efflorescent salt	Audbhida	.....	9 (CS4, A4, C3, Sa4)
224) Rock-salt	Saindhava	.....	37 (S4, CS14, A15, C19, Sa8, B12)
225) Salt petre	Sauraksāra	.....	12 (S1, CS4, A4, C7, Sa6, B3)
226) Alkali from kelp	Sarjikṣāra	.....	4 (S1, C1, B3)
227) Sonchal salt	Sauvarcala	.....	29 (S2, CS8, A14, C22, Sa6, B12)
228) Vida salt	Viḍalavaṇa	.....	25 (S2, CS7, A11, C11, Sa6, B7)
229) Alkali from barley straw	Yavakṣāra	.....	25 (S2, CS8, A9, C16, Sa7, B14)

*S = Suśruta Saṁhitā

CS = Caraka Saṁhitā

A = Aṣṭāṅgahṛdaya & Aṣṭāṅgasaṅgraha

C = Cakradatta

Sa = Śārṅgadhara Saṁhitā

B = Bhaiṣajyaratnāvalī

Numerals following the abbreviations indicate incidence in corresponding texts in chronological order.

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सारांश

आयुर्वेद में हृदय रोग एक ऐतिहासिक समीक्षा

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हृदयरोगों की चिकित्सीय पहचान व उपचार की समस्त सूचनाएं जो कि पिछले लगभग दो हज़ार वर्षो की समयावधि में, सुश्रुत संहिता, चरक संहिता, अष्टांग हृदय, अष्टांग संग्रह, चक्रदत्त, शारंगधर संहिता तथा भैषज्यरत्नावली में उपलब्ध है, से उद्धृत की गई है। यह शोधप्रत्र हृदयरोग सम्बन्धित विषय के ऐतिहासिक पहलुओं पर एक सारगर्भित समीक्षा है। 146 सविन्यासों के गहन अध्ययन के उपरान्त इन में प्रयुक्त 229 एकल औषधियों के कालक्रम व घटनाक्रम सम्बन्धित अध्ययन का उल्लेख किया गया है एवं विशेष उत्पन्न परिणामों की व्याख्या, भविष्यगत् शोध कार्यों के मार्गदर्शन को ध्यान में रखते हुए की गई है।