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Susila.R

Lecturer, Velumailu Siddha medical college and hospital, Sriperumbudur.
Email: susimdnis@yahoo.in

Jeeva Gladys.R

Lecturer, Velumailu Siddha medical college and hospital, Sriperumbudur.
Email: jeevagladys@gmail.com

Balagurusamy.K

Principal, Velumailu Siddha medical college and hospital, Sriperumbudur.
Email: dr.k.balagurusamy@gmail.com

Mubarak.H

Senior Research Fellow(S), SCRUI, Palayankottai.
Email: mubarakbasha@gmail.com

Correspondence:**Susila.R**

Lecturer, Velumailu Siddha medical college and hospital, Sriperumbudur.
Email: susimdnis@yahoo.in
Tel: +919865564621

A Review of Siddha Cardiology and Cardioprotective Herbs

Susila.R, Jeeva Gladys.R, Balagurusamy.K, Mubarak.H

Abstract

In recent years, as the cardiovascular disease multiply worldwide and the disease takes an ever increasing proportion of national and international health care budgets. Though there are numerous existing cause of this dreadful disease the actual factors which become excited according to Siddha system of medicine are the three doshas which are the basic constituents of living body. This paper attempts to highlight the literature analysis of few important herbs that pacify the alleviated doshas in cardiovascular disease which are specifically mentioned in classical Siddha literatures and its correlation with recent researches which prove their cardio protective action.

Keywords: Siddha cardiology, Cardio protective herbs, Siddha.

1. Introduction

Cardiovascular disease is escalating in recent years and remains as a leading cause of mortality in developing countries. The global burden of this disease has made it as a public health goal. The Siddha system is an ancient system of medicine that is practised in southern India which emphasises various herbs with significant cardio protective action. As mentioned in its classical literature, modern era, focuses on various natural cardio protectives that are obtained from phytoconstituents of plant sources like carotenoids, triterpenes, flavonoids, cardiac glycosides and alkaloids. This review article is the analysis of Siddha fundamentals and pharmacological status of cardio protective herbs mentioned in classical Siddha literature thereby proving them as potent antioxidants for cardio protection.

1.1 Global Burden of Cardio Vascular Disease

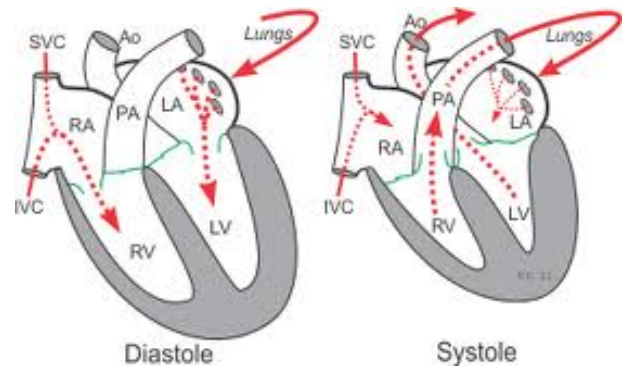
The choice of life style, obesity, diabetes mellitus and hypertension are causative factors of cardio vascular diseases. According to WHO, 17.3 million deaths^[1] occurred in 2008 due to cardio vascular diseases and is projected to rise to about 23.3 million by the year 2030. Over 80% of cardiovascular disease deaths take place in low and middle income countries.

1.2 Fundamentals of Siddha

According to Siddha system, the primordial five elements Mann (earth), Neer (Water), Thee (fire), Vayu (air) and Aakayam (space) are present in every substance in different proportions^[2]. The five element theory of Siddha emphasizes that the forces that are present in Macrocosm (Universe) and are identical with the Microcosm (Human body). Thus a living human is made of these five elements in different combination and the physiological function in the body is mediated by three humours that are made of these five elements. The conglomeration of three humours (Vatham, Pitham, Kabam), Seven basic tissues (Saaram, Senneer, Oon, Kozhuppu, Enbu, Moolai, and Sukkilam) and five basic elements (Mann, Neer, Vayu, Aakayam) is responsible for different structures and functions of body matrix (Table 1 & 2)^[3].

Table 1: Taste and Element Relation

S.NO	Taste	Bhutas
1	Sweet (Inippu)	Earth+Water
2	Sour (Pulippu)	Earth+Fire
3	Salt (Uppu)	Fire+Water
4	Bitter (Kaippu)	Air+Space
5	Pungent (Kaarppu)	Air+Fire
6	Astringent (Thuvarppu)	Earth+Air



Role of Pitham - Important constituent of Blood, Hemodynamics

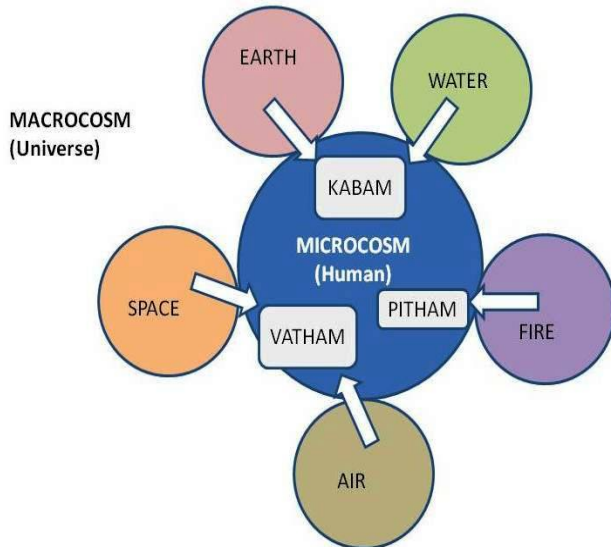


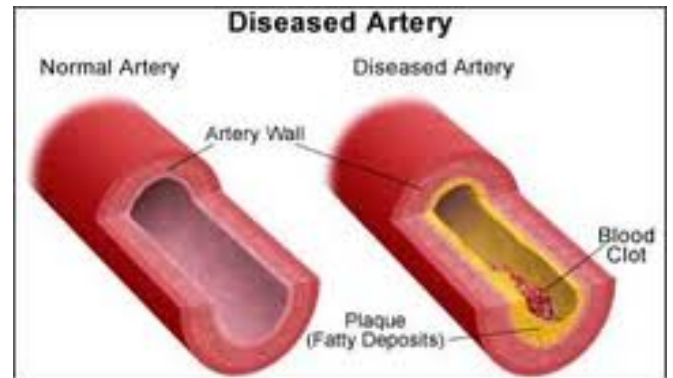
Fig 1: Five elemental theories



Role of kabam – Gives fluid tendency to blood, helps to counter balance vatham and pitham.

Table 2: Role of Humors in Human Body

Vatham	Aakayam(space)+Vayu(air)	Controls movements, action of nerves and sensations.
Pitham	Thee(fire)	Predominant constituent of blood, metabolic activity, Production of warmth
Kabam	Mann(earth) +Neer (water)	Controls stability, predominant constituent of fluid, fat.



1.3 Siddha Cardiology based on the humours

The proper understanding of the role of three humours in human body and analysis of various siddha literatures on three humours has provoked the out Siddha Cardiology and to categorise the Cardiac problems on the basis of derangement of vatham, pitham and kabam. This can further help in the selection of herbs in particular for specific complaints thereby alleviating the sufferings of Cardiac patients without any side effects.

Role of Vatham - Myocardial contractility, Valvular function, Conduction of impulses.

Derangement of kabam results in collection of plagues of cholesterol inside a coronary vessel resulting in atherosclerosis

1.4 Siddha Methodology of Treatment

According to Siddha system any disease condition is caused due to imbalance in three humours (Tridoshas vatham, pitham, kabam) and the treatment is based on the choice of herbs which is able to correct the deranged humour by its nature of opposite action due to its suvai (taste), Veeryam (Potency) and Taste after digestion (Vipaakam) [3]. Any food or drug is classified by its taste, potency and after taste as follows. Each taste is the combination of two basic elements and influences the specific humour (table 4).

Table 3: Classification of Cardiac diseases according to derangements of three humors

Derangements	Vatham	Pitham	Kabam
Increase	<ul style="list-style-type: none"> ➤ Arrhythmia ➤ Ventricular Tachycardia ➤ Angina pectoris ➤ Fibrillations ➤ Rheumatic heart disease 	<ul style="list-style-type: none"> ➤ Hypertension ➤ High output failure (anaemia thyrotoxicosis) 	<ul style="list-style-type: none"> ➤ Atherosclerosis ➤ Stenosis ➤ Cardiomyopathies ➤ Congestive cardiac failure
Decrease	<ul style="list-style-type: none"> ➤ Valvular dysfunction ➤ Coronary heart disease ➤ Bundle branch block ➤ Bradycardia ➤ Congenital heart diseases 	<ul style="list-style-type: none"> ➤ Coronary heart disease ➤ Myocardial infarction ➤ Ischemia 	<ul style="list-style-type: none"> ➤ Diseases of increased pitham

Table 4: The Relationship of Suvai and Three Humors

Humors	Pacifying tastes	Promoting tastes
Vatham	Sweet, Sour, Salt	Pungent, Bitter, Astringent
Pitham	Sweet, Bitter, Astringent	Sour, Salt, Pungent
Kabam	Pungent, Bitter, Astringent	Sweet, Sour, Salt

Table 5: Cardio protective herbs based on taste and deranged humors

For Increased Vatham			For Decreased Vatham		
S. No	Herbs	Cardio Protective Action	S. No	Herbs	Cardio Protective Action
1	<i>Cocos nucifera</i> <u>Tamil name</u> <i>Thengaai</i> <u>Taste</u> Inippu (Sweet)	Tender coconut water, decreases the serum enzymes (CPK, LDH, SGOT, SGPT) and myocardial damage in isoproterenol treated rats ^[4]	1	<i>Andrographis paniculata</i> <u>Tamil name</u> <i>Nilavembu</i> <u>Taste</u> Kaippu (Bitter)	Andrographolide protects the cardiac myocytes against hypoxia/reoxygenation injury and antioxidant activity ^[4]
2	<i>Glycyrrhiza glabra</i> <u>Tamil name</u> <i>Athimadhuram</i> <u>Taste</u> Inippu (Sweet)	Protected myocardial ischemia/ reperfusion injury ^[4]	2	<i>Bacopa monnieri</i> <u>Tamil name</u> <i>Pirammi</i> <u>Taste</u> Thuvorppu (Astringent)	Bacosides A&B, significant rise in endogenous antioxidants ^[4]
3	<i>Vitis vinifera</i> <u>Tamil name</u> <i>Thiraatchai</i> <u>Taste</u> Inippu (Sweet)	Restored normal mitochondrial function, altered the level of all cardiac parameters normally ^[4]	3	<i>Crocus sativus</i> <u>Tamil name</u> <i>Kungumapoo</i> <u>Taste</u> Kaippu (Bitter)	Crocin modulated the activities of myocardial creatine CK-MB isoenzymes SOP,CAT and reduced GSH ^[4]
4	<i>Cynodon dactylon</i> <u>Tamil name</u> <i>Arugampul</i> <u>Taste</u> Inippu (Sweet)	Produces marked reduction in number, duration and incidence of ventricular tachycardia ^[5]	4	<i>Terminalia arjuna</i> <u>Tamil name</u> <i>Marudhu</i> <u>Taste</u> Thuvorppu (Astringent)	Prevents the myocardium from isoproterenol induced myocardial ischemic reperfusion injury ^[4]
5	<i>Nelumbo nucifera</i> <u>Tamil name</u> <u>Taste</u> <i>Thaamarai</i> Inippu (Sweet)	Positively altered the activities of cardiac markers ^[6] .	5	<i>Citrus aurantium</i> <u>Tamil name</u> <i>Kichilipalam</i> <u>Taste</u> Kaippu (Bitter)	Has cardio protective Volatile oil, alkaloid ^[4] .

Table 6

For Increased Pitham			For Decreased Pitham		
S.	Herbs	Cardio Protective Action	S.	Herbs	Cardio Protective Action
1	<i>Tinospora cordifolia</i> <u>Tamil name</u> <i>Seenthil</i> <u>Taste</u> Kaippu (Bitter)	Berberine, Columbine, Chasmanthium, Tinosporon, Tinospora acid, Tinosporol ^[4] that are cardio protectives.	1	<i>Zingiber officinale</i> <u>Tamil name</u> <i>Inji</i> <u>Taste</u> Kaarppu (Pungent)	Significant decline was shown in the activities of cardiac markers such as ALT, AST, LDH and CK ^[4] .
2	<i>Saraca indica</i> <u>Tamil name</u> <i>Asokamaram</i> <u>Taste</u> Thuvvarppu (Astringent)	Significantly increased the level of antioxidant markers and decreased the level of biomarker enzymes ^[7] .	2	<i>Allium cepa</i> <u>Tamil name</u> <i>Vengayam</i> <u>Taste</u> Kaarppu (Pungent)	Attenuates ischemia/hypoxia induced and antioxidant effect ^[8] .
3	<i>Terminalia chebula</i> <u>Tamil name</u> <i>Thandri</i> <u>Taste</u> Thuvvarppu (Astringent)	Significantly prevented the alterations and maintained a near normal antioxidant status results suggest that it has cardioprotective action ^[9] .	3	<i>Curcuma longa</i> <u>Tamil name</u> <i>Manjal</i> <u>Taste</u> Kaarppu (Pungent)	Augments endogenous antioxidants decline in cardiac function and oxidative stress ^[4] .
4	<i>Asparagus racemosus</i> <u>Tamil name</u> <i>Thanneervitan</i> <i>kizhangu</i> <u>Taste</u> Inippu (Sweet)	Has cardio protective Saponins, shatavarins ^[4]	4	<i>Ocimum basilicum</i> <u>Tamil name</u> <i>Naai thulasi</i> <u>Taste</u> Kaarppu (Pungent)	Gallic acid, Quercetin were have the free radical scavenging activity ^[10]
5	<i>Hydrocotyle asiatica</i> <u>Tamil name</u> <i>Vallarai</i> <u>Taste</u> Inippu (Sweet) Thuvvarppu (astringent) Kaippu (Bitter)	A reduction in left ventricle necrosis and lipid peroxide levels ^[4]	5	<i>Tephrosia purpurea</i> <u>Tamil name</u> <i>Mukkavelai</i> <u>Taste</u> Kaarppu (Pungent)	Has the action of free radical scavenging and anti lipid peroxidation activity ^[11] .

Table 7

For Increased Kabam			For Decreased Kabam		
S.	Herbs	Cardio Protective Action	S.	Herbs	Cardio Protective Action
1	<i>Nigella sativa</i> <u>Tamil name</u> <i>Karuncheeragam</i> <u>Taste</u> Kaippu (Bitter)	The extract gives all the parameters (LDH, CPK,AST, ALT, Lipid profile) were maintained at near normal ^[12]	1	<i>Phyllanthus emblica</i> <u>Tamil name</u> <i>Nellikai</i> <u>Taste</u> Inippu (Sweet) Pulippu (Sour)	<i>Phyllanthus emblica</i> - EtOH (100 µg/ml) showed the highest cardio protective effect ^[13]
2	<i>Nerium oleander</i> <u>Tamil name</u> <i>Arali</i> <u>Taste</u> Kaippu (Bitter)	Prevented the elevation of marker enzymes ^[14]	2	<i>Nymphaea Pubescens</i> <u>Tamil name</u> <i>Neither kizhangu</i> <u>Taste</u> Inippu (Sweet)	Offers promising hypolipidemic effects potent antioxidant potential ^[15]
3	<i>Embelia ribes</i> <u>Tamil name</u> <i>Vaavilangam</i> <u>Taste</u> Kaippu (Bitter)	Decreases the elevated marker enzyme levels in serum and heart enhances the antioxidant defence system ^[4]	3	<i>Anacardium occidentale</i> <u>Tamil name</u> <i>Munthirikai</i> <u>Taste</u> Inippu (Sweet)	Has cardio protective Flavanoids ^[4]
4	<i>Ficus hispida</i> <u>Tamil name</u> <i>Peyathi</i> <u>Taste</u> Kaippu (Bitter)	Protected cardiac tissue by scavenging the free radicals ^[4]	4	<i>Hemidesmus indicus</i> <u>Tamil name</u> <i>Nannaari</i> <u>Taste</u> Inippu (Sweet)	Coumarino-lignoids, Hemidesmine ^[4]
5	<i>Azadirachta indica</i> <u>Tamil name</u> <i>Vembu</i> <u>Taste</u> Kaippu (Bitter)	Cardioprotective antioxidant. A significant increase in heart rate were observed and showed significant decrease in the level of cardiac marker enzymes [(LDH) (SGOT)] ^[16]	5	<i>Phoenix dactylifera</i> <u>Tamil name</u> <i>Paarechu</i> <u>Taste</u> Inippu (Sweet)	Phenolics, ferulic acid, major phenolic acid, potent anti-oxidant, free radical scavenging activity ^[17]

2. Discussion

Free radicals are known inducers of cellular and tissue pathogenesis. Oxygen free radicals are implicated as indicators of tissue injury in cardiovascular diseases. Free radical generation and lipid peroxidation could be involved in isoproterenol induced cardiac damage, Myocardial infarction which is the most dreaded sequel among Ischemic heart disease followed by several biochemical alteration such as lipid peroxidation, free radical damage leading to qualitative and quantitative alteration of myocardium. Various phytoconstituents from plants were responsible for cardio protective activity including carotenoids, triterpenes, flavonoids, Cardiac glycosides, alkaloids. Research studies report that these phytoconstituents significantly prevented the altered biochemical variation such as marker enzymes SGPT, ALT, SGOT, AST, CPK, ALP, Cholesterol profile, GSH, CAT. According to Siddha system of medicine the choice of cardio protective herbs can be made based on their taste to pacify the deranged humour and therefore cardiac disorders that can be caused due to the derangement of specific humour can be successfully prevented. The positive effects are believed to be attributed due to the presence of certain antioxidants that inhibit free radical generation and thereby act as cardio protective.

3. Conclusion

This work highlights the Siddha perspective of pathogenesis of cardiac diseases based on the derangement of three humours vatham, pitham and kabam and the treatment methodologies in Siddha to pacify the deranged humours based on the fundamental knowledge of Siddha which emphasise the taste of the cardio protective herbs. The present day research studies on pharmacological status of various herbs mentioned in classical Siddha literature potentiates the work on cardio protective plants for further clinical researches and for finding the way-out to reduce the mortality of cardiovascular diseases.

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