



ISSN 2456-3110

Vol 1 · Issue 4

Nov-Dec 2016

Journal of
**Ayurveda and Integrated
Medical Sciences**

www.jaims.in

JAIMS



Charaka
Publications

Indexed

Circulatory system of Sharangadhara Samhita

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ABSTRACT

The history of the discovery of blood circulation: unrecognized contributions of Ayurveda masters' raising at most relevant issue of neglected Ayurvedic scholars' contribution to the field of Anatomy-physiology well ahead of the contemporary developing sciences. Crawling in the same lines this article is dedicated for one such legendary Sharangadhara and his work related to Circulatory system. Structural entities play a major role in any of the system; especially in Medicine and that too in Ayurveda as it recommends 'Rogam ado pareekshet' shows how important the examination of a diseased person is considered by our Acharyas. The Circulatory System is one such structural physical entity, not only circulate but has additional Functions like Nutrition, Metabolism, Excretion system of body depends, endocrine etc. As early as 200 BC, works to understand this human body was initiated. In this article an attempt is made to sketch out the understanding of circulatory system as evident in 14th century in India through the prismatic view of Sharangadhara Samhita and its commentator.

Key words: Circulatory system, Sharangadhara Samhita.

INTRODUCTION

Sharangadhara's period is considered as the beginning of compilation and specialization era of Ayurveda; a drift seen from *Astanga Ayurveda*, as the same Idea is being reflected in his contemporary writers like Madhavakara and Bhavamishra. They are scholarly persons who took Ayurveda in the difficult period of Geo-political, Patronage and cultural drift happened in India; historians call it as post *Shodala* period. Commonalties found in their work can be listed as,

1. They are experimental and inclusion of disease

likes Amavata, Shuka roga, firanga and upadamsha like disorders being included.

2. Specific area of authenticity is seen; Madhava Nidhana in particular never spoke even a word in treatmental aspects, while Sharanaghadara and Bhisajya Rathnavali oriented themselves around the treatment.

If one analyze this with myopic view to understand why such a drift is seen in Ayurveda when already classical like Brihat trayee were present. Perhaps a perfect answer may not be possible as one has to relive in such period and can speak truth. At most one can give possible reasons in such stand:

1. Patronage drift as an effect of medieval geopolitical change towards another home grown system of medicine called Unani a system belnded with Middle East and South East Asia.
2. Taking into consideration of the size of work of laghutrayee, it is possible to state a lighter version of Ayurveda was aimed and perhaps a small or bridge course might have in practise. But the higher learning was trusted in classical study of Brihatrayee as we see classical commentaries

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Submission Date : 20/10/2016 Accepted Date: 23/11/2016

Access this article online

Quick Response Code



Website: www.jaims.in

DOI: 10.21760/jaims.v1i4.6926

came in this period like Chakrapaniduta, Dalhana, Arunaduta and Hemadri came out with their commentaries. A need might have been felt to address the issues related to lay man and as a sub system with mass reaching abilities was felt for to fill up gap and to coup up the upsurge of Unani. The works of laghu trayee might be a preliminary level study and for the higher study the classical works of Brihat trayee might have entrusted with their commentary preserving the intactness and transmission of the knowledge of the system to the next generation.

3. May be specialization as a process of ramification to ease the learning processes in a more simplified manner; i.e., as the system get organised the slaving responsibilities for effective and efficient manner the works of laghu trayee evolved. For example the Diagnosis and Treatment might have occurred as separate levels of learning. We find in the history evident Madhava approached Chakrapani for critical notes on diagnostic methods. Pharma procedures and the detailing of the preparation found in Sharangadhara.

Though history has washed away but its imprints are still alive in their work. This is one such attempt being made to unwind, understand and learn the basis of circulatory system through Shareera Rachana terms called *Siras* and *Dhamani* terms and that too with the perspective of Sharangadhara Samhita.

History of the Circulatory System in contemporary system:

The most basic principles of the circulatory system took thousands of years to uncover. An Egyptian papyrus dating back to 1500BC correctly correlated the character and frequency of the pulse with the patient's health status. Hippocrates (460-355BC) and his pupils also drew accurate conclusions regarding the nature of blood flow. One pupil described the perpetual movement of blood "with courses of rivers returning to their sources after a passage through numerous channels". However, this concept of circularity would only be confirmed two millennia

later by William Harvey. It was Aristotle, the anatomist, philosopher, and knowit-all of the time who began the disruption of scientific understanding of the heart and its system. While some of his physiological ideas bore some value, he also committed the academic disservice of attributing 'the seat of body intelligence' and the source of body heat to the heart. Such exaggeration of the heart's function in the body was mirrored by Erasistratus (c. 310-240BC) who first described the heart's valves, and explained that air entered the heart from the lungs where it was transformed into 'pneuma', the vital spirit, 'a most subtle vapor' to be carried to the body by arteries.

Galen claimed that the liver produced blood that was then distributed to the body in a centrifugal manner, whereas air or pneuma was absorbed from the lung into the pulmonary veins and carried by arteries to the various tissues of the body. Arteries also contained blood, which passed from the venous side via invisible pores in the interventricular septum and peripheral anastomoses.^[1]

William Harvey (1578-1657) who finally deconstructed the false views of the cardiovascular system in his "De Motu Cordis", a short book specified that blood moves, 'as it were, in a circle' and 'this is the only reason for the motion and beat of the heart'. He emphasized that the heart is no other thing but a pump as if to crush the spiritualistic functions imposed on the heart until that time. Finally, Marcello Malpighi (1628-1694), Jacob van Swammerdam (1637-1680), and Anthony van Leeuwenhoek (1632-1723) used the microscope to explain the shape of the red blood cell and the capillary networks that form the connection between arterioles and venules.^[2] A point to be noted is even by the end of 16th century AD there was enough dogma regarding the Circulatory system. Under this limelight one has to read the Sharangadhara's perspectives.

REVIEW OF LITRATURE

Count of *Sira* and *Dhamanis* ^[3]

In fifth lesson of *Sharangadhara Samhita Poorva Kanda* we find the fragmental description of associate

structures related to Circulatory system. The *Siras* are seven hundred, and *Rasavahini* (the channels of *Rasa*) *Dhamanis* are twenty four.

Siras are 700 in number, *Siras* transport *Doshas*, and *Dhatu*. The use of word '*Chakara*' has significance that by the other opinion they are numerous. "1027 are counted *Siras* again there are many; as many as *Roma Kupa*. The *Siras* may be *Sthula*, *Sukshma*, as a leaf like, are even *Prathanthavat*. *Dhamani* are *Nadi Vishesha* and are 24 as stated *Rasavahi*; *Shira*, *Dhamani*, *Nadi* are synonyms. But we find difference in *Shira*, *Snayu* and *Dhamani* based on functions. In males the *Mamsa* also called as *Mamsa Granthi* and are counted as 500. *Dehaoshma* present in *Kala*. *Siras* are 700 in number, *Siras* transport *Doshas*, *Dhatu*. Site of *Ranjaka Pitta* is *Yakrith* and it is the *Raktha Vahini Shira* and its *Moola* is *Pleeha*.

Siras, Dhamani functions

The *Siras* and *Dhamanis* which exist (get rooted) in *Nabhi* (navel) are spread all over the body and they nourish the *Dhatu*s continuously.^[4]

Deepika Commentary:

From *Nabhi* means taking word for *Nabhi* as *Mula* and the *Siras* those spreads to entire body. The *Dhamani* resides in *Sira*. *Sira* are *Dhamanis*; as they also have *Saranatva* (flowing) and the *Dhamani* which has *Dhamanatva* (pulsate) in nature hence called as *Dhamani* and work throughout day and night. This function of *Dhamanatva* brings nourish to *Deha*. Hence the tender body is nourished. The older ones are maintained. As stated that 'the old aged person has reached the maturity stage and in this stage the nourishing is not seen.'

How *Poshana* is being made? With the help of *Vata Sayoga* etc; the synchronous *Vayu* and *Agni Sayoga* as natural helpers. As stated 'the *Karya* of *Poshana* is of a *Prthigathaka* in nature and occurs without knowledge of it being carried out under the normal sense activity. The *Gunas* of the *Ahara* is being carried away by the respective *Siras* along with *Vata Dosh*a. Which of them being nourished? – all the parts of the body.

Goodartha Deepika Commentary:

The *Sarva Dhatu* here connotes the seven *Dhatu* starting with *Rasadi*. By doing so *Siras* ensures they bring about the natural activity. As stated – 'they dose nourishment to the *Deha* just like that of *Kedara Kulya*. The channels of irrigation bringing the *Snehana* etc.; the similar thing is brought by the *Akunchana* and *Prasarana Adi Karma* by the *Deha*. Is it not so, that which originated from the *Nabhi* reaching out to the entire body certainly. As stated – 'the spread to all parts of the *Deha* starting from the *Nabhi* similarly lotus being nourished from its *Bisa* (tuber present in the water.)

Inference:

The word tender *Dhatu*s implies the process of anabolic activity and such a type of the circulatory system is seen in the fetus nourishment closely correlated today's understanding as fetal circulation. *Nabhi* word also specifies umbilical cord circulation of growing fetus. But after delivery the function is over taken by the heart proper. The other type of *Dhatu Poshana* seen in *Vrudhapy*a where in state of *Dhatu Reehyamana* stage the maintenance of decaying tissues are considered for nourishment. But the anabolic process of *Dhatu Poshana* is seen *Balya Avastha* because of *Apraptha Dhatu Avastha*.

The use of the word *Akunchana* and *Kedara Kulya Prasarana Adi Karma* not only define the physical transfer of the circulation but also maps the process.

Sira – Dhamani Rachana and Kriya

One of the stridently discussed topics is *Sira* as channels for connection. While counting the *Shareera* related entities in the 5th chapter of *Poorva Khanda* we find relevance of 700 *Siras* are centered at the navel and spread out all over the body and carry *Doshas* etc. from place to place; and at the joints, they facilitate movements like flexion and extension. *Dhamanis* are those which do *Dhamana*. In fact, according to *Sushrutha*, there is no difference between *Sira* and *Dhamani*. They are so called due to particular activity of pulsatile nature.

In *Deepika* commentary classification of *Siras* are dealt and they are of two types *Sthula* and *Sukshama*; their *Mulas* or origination is from *Nabhi* and have tendency to run upper, downward and tridimensional way. As stated the *siras* are present in the body and all of them originate from the *Nabhi* rapping up and spreads throughout the *Deha* evenly. And stated that at *Mula* they are 40 in number; ten *Siras* are for *Vata Doshas*, ten *Siras* are for *Pitta Doshas*, ten *Siras* are for *Kapha Doshas* and ten *Siras* are for *Raktha Dhatu*. The *Vata Vahi Siras* having directed to *Vatasthana* and divides in to 705. Similarly the *Pitta Vahi Siras* having directed to *Pitta Sthana* and divides in to 705. The *Kapha Vahi Siras* having directed to *Kapha Sthana* and divides in to 705. the *Rakta Vahi Siras* having directed to *Yakrith* and *Pleeha* ramifying in to 705. And become instrumental in *Sandhibandhana* Karinya i.e. helps in *Akunchana – Prasarana* etc.

Table 1: Count of Siras

Sl. No.	Type of Snayu	Count
1	Mula (Nabhi)	40
2	Vata doshas,	10
3	Pitta doshas	10
4	Kapha doshas	10
5	Raktha dhatu	10

The description of *Dhamanai* is stated by *Dhamani Iti: "Dhamanyath Anila Puranath Dhamani"* is specifies *Nirukti* of *Dhamani* i.e. that which is pulsating and by this means it is filling the *Vata* in to it. *Dhamani* carries the *Rasa* and is 24 in number. Their by the influence of *Nabhistita Vata* the upward 10 *Dhamanis*, those trending downward is of 10 and remaining 4 have a tendency of tridimensional and reaches out all parts of the body by continuous ramification, as that of the channels of river source and reaches out the openings of sweat glands which are present at hair follicles and performs the letting out of the sweat from the body; this set of reticulation is also used to

circulate the *Rasa* internally and externally for nourishment; this is the set up even for the absorption of medicaments applied on the skin like *Abhyanga, Parisheka, Avagaha, Alepa* etc. By doing the *Santarpana* as a means of *Rasa* circulation and the absorption of medicaments applied on the skin like *Abhyanga, Parisheka, Avagaha, Alepa* etc. the *Dhamanis* are totally responsible for the *Dharana* of entire *Deha*.

Goodartha Deepika opined by stated '*Shiranam Shata Saptake.*' *Acharya* starts the description of the *Siras* as 700 in number. These *Siras* help in the binding of *Sandhi*. And it also helps in the circulation of the *Dosha* and *Dhatu*. As we find in some of the references, where in the *Siras* are elaborately described; as that which is helpful in the binding of the *Sandhi*, helps in *Doshadi Vahana* and having originated from the *Nabhi* all the body parts are supported by these *Siras* as that of *Prathanti* (tapes like). As that of arrangement seen in the plugged field and the seeds, similarly helps in the *Akunchana* (contractions) etc. functions as a continuous process. The *Siras* which is divided in to 700 has additional functions. The *Siras* as that of in a tree the leaf seen originating from the branches posses the reticulation of veins, similarly in the body the *Siras* has reaching out to every part of the body. So for the *Shareera*; the life is existing because the role of *Siras*. It is stated that the life resides in *Nabhi* and the *Nabhi* itself is the life. As a wheel being protected by the nail similarly the body gets protected by *Siras*. As per *Sushruta Acharya* the *Prana* is in *Nabhi* as that of a wheel is protected by nail (*Ara*). And *Prana* is *Prana Vayu*. Such *Prana* are of the ten types and they are *Naga* etc. Where? In the *Nabhi Sthanam, Parna* and *Pranavaha* are located in the *Nabhisiras*. What is resided in the *Nabhi*? As *Nabhi Shabdha* etc., tie as that of *Nabhi* from the center of body in the *Shareera*. *Vagbhata* extended saying *Dhamanis* related to *Nabhi* 30 circulates though out body.

Nabhi having the center for reticulation similar to that of the spokes of a wheel become center for the radiating *Siras*. Hence *Sharangadhara* considered it as

two types. *Sira* and *Dhamani* starting from the *Nabhi* spread throughout the body. Nourishment of the *Deha* is in association of *Vayu* and to all *Dhatu*s. The *Dhamanis* however are different from the *siras*. Hence Sushruta writes the *Sira*, *Dhamani* and *Srothas* are different entities. If it is not differentiated by individual identities then *Sira Vikara* are taking shelter *Dhamani* and the *Dhamani* as *Sira Vikara*. Hence the *Dhamnyat* – that which has pustule is *Dhamani*. Here onwards the description of *Sira Sankhya* (counting of *sira*) – as per Sushruta the *Sira* are 40 in basic classification ten *Siras* are for *Vata Doshas*, ten *Siras* are for *Pitta Doshas*, ten *Siras* are for *Kapha Doshas* and *Raktha Vaha* as they are carried by *Vata* reaches out the *Vata Sthana* and they are of 25 types of *Siras* are for *Dhatu*. The other 25, in *Hasta* the 25 are there, and the second 25, similarly the 100 are there in *Shaka* and in *Koshta* 24 and there description is that, they are present in *Shroni*, *Guda*, *Medhra* there are 8, 2 each in *Parshva*, 6 in *Prustha*, 6 in *Urdhva*, 14 in *Greeva*, 4 in *Karnas*, 9 in *Jheeva*, 6 in *Nasa*, 8 in *Netra*. Similarly the *Vata Vaha* is 705 likewise *Pitta*, *Sleshma* and *Raktha* has to be presumed. Similarly the *Shiraaja* 700 is the number. The *Aruna* is for *Vata Dosh* *Vahana* (conduct) and has been dealt as *Vayu Siras*. The one which conducts *ushna* are *Asethavarana*. The *Goura Shira* is for *Kapha Doshas Vahana*. The *Raktha Vahanartha Rakthavaha Shira* and they are neither *Sheeta* nor *Ushna*. So the *Dhamani* are of 24 in number as stated earlier there use are; the *Dhamanis* are *Rasavahini* and they are pulsating because of the *Vata*. Hence Sharangadhara's untold should be learnt by considering the allied Samhitas. So the *Dhamani* which originates from the *Nabhi* are 24 in number and upward 10 and downward 10 the left over are of tridimensional in nature. As they are by nature hollow structure and through these structures the *Rasa* moves. They are born out of *Pancha Mahabhuta* and has divided as 5 based on *Pancha Indriya*. At the time of death these structures collapses. That (the commentator) take the meaning as these structures are formed by *Pancha Mahabhuta*, having divided as five and such 5 brings the *Karma* of *Panchendriya*; how? The 5 *Srothra Adi Indriya Adhistana* is itself is

formed by these types of *Dhamanis* but at the time of death the collapsing of these halo structures occurs. How ? the *Dhamani* having accessed with *Pancha Mahabhutas* like *Akashadi* resides is stated by *Panchabhibhuta*, and is responsible for *Shabda*, *Sparsa*, *Rupa*, *Rasa* and *Gandha* respectively for *Akasha*, *Vata*, *Dahan*, *Toya* and *Bhumi* and spreads and brings the *Panchatva* meaning that covers the *Indriyas* and had perception by these *Dhamanis*, as they *Panchendriya* and *Indriyapanchaka* are of *Shukshma Roopa* (subtleness), So ends the *Dhamani* description.

Siras are responsible for *Sandhibandhana* of the *Mula* can only be explained taking the *Poshana Krama* from the *Nabhi* and this is the mark of both the commentators as they narrate - *Siras* are centered at the navel and spread out all over the body. *Siras* carry *Doshas* etc. from place to place; and at the joints, they facilitate movements like flexion and extension. *Dhamanis* are those which do *Dhamana* (blowing). The blowing is formed by *Siras* to make nourishment – i.e. set of reticulation is also used to circulate the *Rasa* internally and externally for nourishment; this is the set up even for the absorption of medicaments applied on the skin like *Abhyanga*, *Parisheka*, *Avagaha*, *Alepa* etc. By doing the *Santarpana* as a means of *Rasa* circulation and the absorption of medicaments applied on the skin like *Abhyanga*, *Parisheka*, *Avagaha*, *Alepa* etc. the *Dhamanis* are totally responsible for the *Dharana* of entire *Deha*. *Deepika Kara* not only shown the inter-relationship of *Nabhi* and *Sandhibandhana* but had brought the peripheral circulation including dermal drug dynamics is also established.

Goodartha Deepika Kara

Identification of the divisions of *Sira* can be said a need specific development who's authenticity on the dissection can be questioned but to support the very identity of *Dosha Siddanta* it might have formulated to accommodate even *Raktha Dhatu*. This *Raktha Dhatu* has even at times being accepted as forth *Dosha* for the role it play in manifesting disease.

He not only stated but also illustrated classification of *Pancheindriya*, accessing the role of *Pancha Mahaboortha* in these *Dhamanis*. Further the reason for their dilation and for any cascade of *Gunās* brought by them is established, this also lets us to imagine the pharma-co-dynamics of the therapy.

The *Prana* context a unique attempt is made to show the *Pramanas* for the existence of life (*Prana*) on the structural entity called the *Siras*. The *Panchatva* is nothing but the loosing of this dilation factor which yield death there by the functioning of *Siras* come to an halt.

The structures of *Siras* are utilized to establish the pharma-co-kinetics of transdermal application. The insight of coating the example of leaf is very much identical to demonstrate the reticular structures of *Siras*. Though the reticulation structures being identified in the *Sandhi Prakarana* but still explanation appears to be out of context.

Sira and Peshi ^[5]

Structurally they are covered by *Peshi* as per the following *Deepika* commentary the formed muscle structures having divided by each other are called *Peshi* (Bursa?) as that of relation of *Bala* and *Ojus* extending the others opinion as *Sira*, *Snayu*, *Asthi*, *Parvani*, *Sandhi* in a body being covered by *Peshi* (more of a covering structure) and provides the *Bala* to these structures.

Other relevance of the use of term *Sira*;

1. *Tilam* is stated as the *Kloma* and this is considered as the *Pippasa Sthana*. Hence the same is considered as the *Jalavahi Shira Mula* is *Tilam*.
2. The one seated in the *Hrudaya* and *Uras*, *Siras* of *Sandana* of *Bhahus*, is of binding functions, and besides it also makes the *Sneha Karma* of *Hrudaya* *Sira*, *Snayu*, *Asthi*, *Parvani*, *Sandhi* in a body being covered by *Peshi* (more of a covering structure) and provides the *Bala* to these structures.
3. The *Mamsa Peshis* are muscular structures which from cover to the *Mamsa* etc. (*Shira*, *Snayu*, *Asthi*, *Parvani*, *Sandhi*) and give shape and strength.

DISCUSSION

Siras at *Mula (Nabhi)* are 40 in number, the functional classification is *Vata Doshas* 10, *Pitta Doshas* 10, *Kapha Doshas* 10 and *Raktha Dhatu* 10 and further dividing into 705 each speaks about the ramification of major channels of circulation and to ease in interest of conceptualize the Ayurvedic principle.

On the other hand *Dhamanyath anila puranath Dhamani* technically speaks about related structure of Arteries. But when added the word *Nadi* which are also Arteries we have to limit the meaning of palpable Arteries.

By saying *Dhamani* carries the *Rasa* and are 24 in number. There by the influence of *Nabhistita Vata* help in the upward oriented 10 *Dhamanis*, those trending downward is of 10 and remaining 4 have a tendency of tridimensional reticulation so as to reach out all parts of the body. Certainly spells out the roll of *Dhamani* in Circulation. Though we have *Hrudaya* and *Nabhi* as *mula* of *Rasavaha srotho mula* but neither case in any way justify the *Dasha Dhamani*. *Nabhistita vata* involvement is involved in the process of circulation. This *vata* even performs the letting out of the sweat, circulate the *rasa* internally and externally for nourishment and absorption of medicaments applied on the skin like *abhyanga* clears the very idea of such setup has to offer in parallel to today's understanding of excretion through skin, circulatory system and pharma-dynamics associated with skin.

The relevance of *Vata* reaches out the *Vata sthana* and they are of 25 types of *siras* are for *dhatu* etc where in various types of *siras* are stated and *varna bedhaja* classification are hard to establish a congruency by any of the anatomical structures. Even if the numbers are speculative as a representation of symmetrical body patterns and the mentioning of *varna bedhaja* can only be understood for the ease in the therapeutic simplified approach of doshic siddanta.

The statements *Dhamanis* are *Rasavahini* and they are pulsating because of the *Vata* confines the function of circulatory system. And *Siras* are more

responsible to carry three types of doshas and Raktha. Even if taken rasa and raktha makes the blood and such assumption eases the half of our hypothesis that the circulatory systems are brought by Sira and Dhamani.

The other half truth is that the same circulatory mechanism is responsible for draining and aiding excretion etc. Then the contemporary science's exo and endocrine system, homeostasis etc. functions are to be brought by Siras or Dhamanis. The answer is yes the Siras in the form of functions of doshas that they carry were assigned with such functions. In Ayurveda the Kriya samarthya is assigned to the doshas and these doshas are being carried by the structural entities called *Sira* and *Dha`mani*.

Goodartha Deepika specifies the cause of collapse of the special types of Dhamanis based on Panchamahabootha siddhanta. They are born out of Pancha mahabhuta and are divided into 5 based on pancha indriya i.e. the panchendriyas are brought and nourished by the Panchamahabootha for their proper functions. At the time of death these structures collapses. Even today one of the last sign in conformation of death is pupil dilation which is nothing but the Panchamahabootha had its Panchatva leena.

CONCLUSION

In Ayurveda the structural entities are studied from the perspective of phato-physiological and for to ease in establishing therapeutics. Very assumption of Tri-doshas based on the *Guna Siddhanta*; which are attributed by the *Panchamahabootha* the structural entities of universe is to facilitate simplification in the applications of treatment. The descriptions of nature of structures of siras and Dhamani speaks volumes of the Anatomical knowledge they possess, but the classification and numbering is to help the therapeutical application. Sharangadhara Samhita and its commentators had continued the tradition of knowledge but added that *Nabhistita Vata* helps in the circulation of rasa along with excretion through

skin, circulatory system and pharma-dynamics associated with skin. The Goodartha Deepika had worked out pancha maha boota concept for the nourishment of the indriyas and aids the aspects of siras in the determination of death. Use of the words like *Sthula* and *Sukshama Siras Mulas* or origination is from *Nabhi* and have tendency to run upper, downward and tridimensional way that have the knowledge of divisions of siras this explanation appeals totality when we consider the nourishment of a fetus.

REFERENCES

1. INVITED REVIEW Discovery of the cardiovascular system: from Galen to William Harvey W. C. AIRD The Center for Vascular Biology Research, Department of Medicine, Beth Israel Deaconess Medical Center and Harvard Medical School, Boston, MA, USA) <http://onlinelibrary.wiley.com/doi/10.1111/j.1538-7836.2011.04312.x/epdf>
2. History of the Circulatory System: discovery of the basics Adam Garber, Medicine 2010 and Michael Livingston, Medicine 2011 Reviewed by Dr. Vivian McAlister) <http://www.uwomj.com/wp-content/uploads/2013/06/v77n2.22-24.pdf>
3. Sarangadharacarya, Adhamalla, Kasirama, Dipika and Gudhartha Dipika on Sarangadhara Samhita Edited by Padit Parasurama shastri, Vidyasagra Chowkhamba Orientalia, Varanasi, 2010, 40pp
4. Sarangadharacarya, Adhamalla, Kasirama, Dipika and Gudhartha Dipika on Sarangadhara Samhita Edited by Padit Parasurama shastri, Vidyasagra Chowkhamba Orientalia, Varanasi, 2010, 59pp
5. Sarangadharacarya, Adhamalla, Kasirama, Dipika and Gudhartha Dipika on Sarangadhara Samhita Edited by Padit Parasurama shastri, Vidyasagra Chowkhamba Orientalia, Varanasi, 2010, 56pp

How to cite this article: Dr. H Pampanna Gouda, Dr. Govind Raju, Dr. Seema M B. Circulatory system of Sharangadhara Samhita. J Ayurveda Integr Med Sci 2016;4:98-104.

<http://dx.doi.org/10.21760/jaims.v1i4.6926>

Source of Support: Nil, **Conflict of Interest:** None declared.