

**ROLE OF MEDICINAL HERBS IN THE MANAGEMENT OF
GRIDHRASI (SCIATICA): AN AYURVEDIC APPROACH**

¹*Dr. Jaya Kachchhwaha, ²Dr. Ayush Garg, ³Dr. Meenakshi Kumawat, ⁴Dilip Gehlot,
⁵Dr. Chandan Singh and ⁶Dr. Manoj Kumar Adlakha

^{1,2,3}M.D. Scholar, PG Department of Dravyaguna, Dr.S.R. Rajasthan Ayurveda University
College Jodhpur, Rajasthan, India.

⁴UG Scholar, Dr.S.N. Medical College Jodhpur, Rajasthan, India.

⁵Hod and Associate Professor, PG Department of Dravyaguna, Dr.S.R. Rajasthan Ayurveda
University College Jodhpur, Rajasthan, India.

⁶Assistant Professor, PG Department of Dravyaguna, Dr.S.R. Rajasthan Ayurveda University
College Jodhpur, Rajasthan, India.

Article Received on
26 December 2017,

Revised on 19 Jan. 2018,
Accepted on 08 Feb. 2018

DOI: 10.20959/wjpr20184-11138

Corresponding Author*Dr. Jaya Kachchhwaha**

M.D. Scholar, PG

Department of Dravyaguna,

Dr.S.R. Rajasthan Ayurveda

University College Jodhpur,

Rajasthan, India.

ABSTRACT

In this hectic life sciatic pain is a very common disorder that hampers people from doing their routine activities. *Gridhrasi* (sciatica) is one among *vata vyradhi* caused by aggravated *vata Doshas*. It is characterized by burning, stinging or numbing pain that is felt in the buttock; thigh, leg or foot. It may or may not be associated with low back pain. The main cause of sciatica can be a horizontal or slipped disc, piriformis syndrome, spinal stenosis, spondylolisthesis, in the starting stage people neglect this, but later this becomes a major issue when the pain becomes unbearable. At this stage they might search for a better cure. There are wide ranges of treatment for which includes internal medications for pain and inflammation, Physical therapy &

spinal injections. And lastly surgery is advised for those who do not respond for conservative treatments. But, these are not much successful and therefore those who are suffering from this are always in search of result oriented remedy. Classics of Ayurveda have references related to sciatica, according to Ayurveda signs and symptoms of sciatica are much similar to "*Gridhrasi vaata Roga*." *Gridhrasi* can be treated remarkably with procedures of panchakarma like of *abhyanga*, *swedana* and internal medications. Sciatica pain treated with help of Nirgundi (*Vitex negundo*), Guggulu (*Commiphora wightii*) Eranda roots (*Ricinus*

communis), Ashwagandha (*Withania somnifera*), Long Pepper (*Piper longum*), Jaiphal (Nutmeg/*Myristica fragrans*). This Review paper provides an overview of the effect of medicinal herbs on sciatica.

KEYWORDS: Sciatica, *Gridhrasi*, Medicinal Herbs, Ayurvedic, *Nirgundi*, *Guggulu*.

INTRODUCTION

Sciatica is a clinical term applied when shooting pain is felt along the course and distribution of sciatic nerve i.e. in the buttock, posterior aspect of the thigh, posterior & lateral aspect of leg & dorsum of foot. Sciatica signifies sciatic pain without connoting any particular pathogenesis. It is a symptom not a disease. The patient complains of pain in thigh which passes down the leg often to the ankle. The nerve is tender on pressure and pain is caused on stretching it by extending the leg when the thigh is flexed. It is due to large variety of interaspinal intra pelvic and extra pelvic causes. Therefore knowledge of related anatomy is a necessary prerequisite for making differential diagnosis.

Niruktti of Gridhrasi

In Ayurveda, diseases are named by different ways viz. according to *Dosha-Dushya* involvement according to symptoms etc. Here the word *Gridhrasi* is suggestive of the typical character of pain and also the gait of the patients.

Gridhra means vulture. Vulture is fond of meat and has a particular fashion of eating meat. It pierces its beak deeply in the flesh and then draws it forcefully, causing severe pain. The pain in *Gridhrasi* is also of the same kind, hence the name is given. Also, because of the persisting severe pain the patient has a typical gait i.e. slightly tilted towards the affected side and affected leg in flexed position and another leg extended. This gait resembles with that of vulture.^[1]

Definition of Gridhrasi

According to *Acharya Charaka*, "*Gridhrasi* is one among the '*Nanatmaja vata Vyadhi*'.^[2] which is characterized by *Stambha* (stiffness), *Ruka* (pain), *Toda* (pricking pain) and *Spandana* (frequent tingling). These symptoms initially affect *Sphika* (buttock) as well as posterior aspect of *Kati* (waist) and then gradually radiates to posterior aspects of *Uru* (thigh), *Janu* (knee), *jangha* (calf) and *Pada* (foot).^[3] According to *Acharya Sushruta*, where two *Kandara* i.e. ligament of heel and all the toes are affected by vitiated *vata*, so movement of

the lower limb get restricted ;it is known as *gridhrasi*.^[4] As per *acharya Harita*, *Gridhrasi* is a condition originates due to vitiation of *Vyana Vayu* which is responsible for all the types of voluntary movements i.e. expansion, contraction, upward, downward, and oblique.^[5]

Ayurvedic Approach of *Grdhasi*

Classics of Ayurveda have references related to sciatica. These types of diseases are being discussed under the chapter of *Vaata Vyadhi* (diseases of *Vaata*). According to Ayurveda the signs and symptoms of sciatica can be correlated with that of '*Grdhrasi*' explained as '*Grthavath Gati*' - meaning individual affected with this disorder walks like vulture. Hence it is termed as *Grdhrasi*. As it is caused by vitiation of *Vaata* (biohumor) it is popularly known as *Grdhrasi Vaata Roga*. The symptoms mentioned in classical references are specific type of pain which arise from low back region which radiates to lumbosacral region, buttocks, thighs, *down to calf and then to foot and even toes. If the pain is characterized with stiffness, pricking and throbbing in nature then it is due to only Vaata and if there is involvement of Kapha then the pain will be associated with heaviness, drowsiness and lassitude. Depending on dominancy of Dosha, Grdhrasi is divided into two types, they are Vaataja- Involvement of only Vaata Dosha. Vaata kaphaja- Involvement of Kapha along with Vaata Dosha.*^[6]

Nidana* (Etiology) of *Gridhrasi

In case of *Gridhrasi* specific *nidana* has not been mentioned. So the causative factors mentioned producing *Vata vyadhis* are considered as *nidana* and it has been tried to understand the manner in which they produce the disease. Actually there is not much difference in the case of *nidana* in *vatavyadhis*. Mainly the difference is only in *samprapti* in all *vatavyadhis*. *Vata prakopaka karanas* are almost same and the difference like *Gridhrasi*, *pakshaghata* etc. are only due to the *samprapti vishesa* of vitiated *dosha*.^[7] *Charaka*^[8] *Bhavaprakasha*^[9] clearly mentioned the causative factors of *Vata vyadhi*, but in *Sushruta samhita*, *Astanga Sangraha* and *Astanga Hridaya* etc. the causes of *Vata vyadhi* have not been clearly described. However, in these texts the causative factors of provoked *Vata dosha* are available. Since *Gridhrasi* is considered as *nanatmaja* type of disease of *Vata*, the provocative factors of *vata* can also be taken as the causes of *Gridhrasi*. In addition to this, in *Charaka Samhita*, *Astanga Sangraha* and *Ashtanga Hridaya*, the specific causes of *Vata Vyadhi* i.e. *dhatukshaya* and *avarana* have also been mentioned.^[10]

Causes of Sciatica (According to modern)

The causes of sciatica can be

1. A herniated disc or slipped disc-that causes pressure on a nerve root.
2. Piriformis syndrome-when piriformis muscle that lies deep in the buttocks, become tight or spasm which can put pressure on and irritate the sciatic nerve.
3. Spinal stenosis-this condition results from narrowing of the spinal canal with pressure on the nerves.
4. Spondylolisthesis-this is the slippage of one of the vertebra, so that it is out of the line with the one above it narrowing the opening through which the nerve exists.

Physiological aspect of Sciatica

The science of Ayurveda revolves around three basic humor's of body i.e. *Vata*, *Pitta* and *Kapha*. These three basic factors in their equilibrium, determine the state of health and in the disturbed state of their equilibrium cause disease. These three are the actual intrinsic factors of the disease and hence called '*Tridoshas*.'^[11]

Amongst the *Tridoshas*, *Vata* is the governing factor of other two *Doshas*, *Dhatu*s and *Malas* as their movement in the body depends on *Vata*.^[12] *Sushruta* describes that the word '*Vata*' is derived from 'Va' which signifies *Gati* (motion or movement) and *Gandhan* means to enthuse, to make know, to become induction, effort, to enlighten.^[13] *Acharya Charaka* says that *Sharira ayu* is *Asanghata* and *Anavasthita*. It is responsible for the conduct regulation and integration of all vital functions and structures of the body.^[14] According to *Acharya Sushruta*, *Sharira Vayu* which courses through the body is self-originated, subtle and all pervasive, although invisible in itself, yet its works are manifested, it abounds in the fundamental quality of *Rajas*, it is instantaneous in action and radiates through the constant currents.^[15]

Sign and Symptoms

Gridhrasi disease is correlated with sciatica. There are two type mentioned. *Vataja* and *Vata-Kaphaja Gridhrasi*. Here is an attempt to enlist and analyse the symptoms of each type.

Symptoms of *Vataja Gridhrasi*

"*Sphik Poorva Kati Prista Janu Jangha Padam Kramat-Ruk*" (C. Chi 28/56).^[16]

In *gridhrasi* caused by aggravated *vayu*, first of all, the hip is afflicted by stiffness, pain and pricking sensation in the waist, back, thigh, knee and calf region. All these organs get

twitching sensation frequently. If the ailment is caused by both, the aggravated vayu and kapha, then the patient suffers from drowsiness, heaviness and anorexia.

S. No.	Sign and symptoms of Gridhrasi	Vataja Gridhrasi	Vatakaphaja Gridhrasi
1.	Toda	+	+
2.	Stambha	+	+
3.	Ruk –Pain	+	+
4.	Muhu Spandanam	+	+
5.	Tandra	-	+
6.	Gaurava	-	+
7.	Arochaka	-	+

Samprapti-Ghataka of Gridhrasi can be traced out as below

<i>Dosha</i>	: Vata, Kapha pradhan Tridosha
<i>Dushya</i>	: Rakta, Mamsa, Meda, Nadi sansthan
<i>Adhishtan</i>	: Kati, Uru, Janu, Jangha, Pada
<i>Srotas</i>	: Raktavaha, Mamsavaha, Medavaha, Asthivaha Sroto
<i>dushti prakar</i>	: Sanga, Sira granthi
<i>Agni</i>	: Vishmagni, Mandagni
<i>Vyadhi swabhava</i>	: Aashukari/ Chirkari
<i>Sadhyta</i>	: Naveen Krichrasadhya. ^[17]

Samprapti (Pathogenesis) based on shadvidha Krikyakala^[18- 21]

Samprapt of Gridhrasi can be understood through the Shath Krikyakala (six stages), it is as follows.

Chaya-Nidansas leads to accumulation of Aatmarupa of Vayuii.e. Ruksha, Sheeta, Chala Guna (along with Kapha by its Guru and Sheeta property) in its own place, produces the symptoms of Chaya. This is the first stage of Samprapti. Vata when gets aggravated either due to exposure to factors similar to vata associated with Ushna instead of sheeta Guna or due to season or age increase first in its own sites. The condition is called *chayavastha*.

Prakopa-Prakopa is second stage of Samprapti in which accumulated Vata Dosha tends to become swollen and excited. When no therapies have been adopted to subdue Vata at its Chayavastha itself and allowed to get aggravated further due to exposure to its aggravating factors it reaches the stage of Prakopavastha. There are differences in views pertaining to Prakopavastha. According to Sushruta, Prakopavastha is the 2nd stage of evolutionary process of manifestation of disease and there is four more stage of evolutionary processes.

According to them all the five stages of *Kriyakalas* mentioned by *Acharya Sushruta* except *Chaya* will come under the *Prakopa* stage. In the stage of the *Prakopa* the quantity of *Vata* if increased further will be in the maximum quantity at its own sites and is ready to expel. It will cause *Koshtatoda* (sensation of pinning pain) and *Koshta Sancharana* (movement of *Vayu* in abdomen).

Prasaravastha-Prakopa stage is followed by *Prasaravas* in which the vitiated *Vata* propagates all over the body. This is the third stage of *Samprapti*. Symptoms of *Prasara Prakopa* mentioned in classic can be observed at this stage.

This process will lead to *Gridhrasi* of gradual onset. At times when *vata* is exposed to its etiological factors more intensively it may directly reach the *Prakopa* stage and immediately pass on to further stage resulting into the sudden manifestation of *Gridhrasi* which is termed as *Achayapoorvaka Prakopa* or sudden onset. The *Dosha Dhatu* vitiation inside the body which makes proper atmosphere for the manifestation of *Gridhrasi* would have been getting evolved for a very long time before its sudden manifestation. In this stage, the *prasaravaistha vimargagamana* (spreading to other parts) and *Atopa* (painful distension of abdomen, intervertebral disc prolapses) accompanied by rubbing noise of enlargement of particular part are the clinical manifestation by *Vata*.

Sthan-samshrayavastha-The previous three stages have been known as stages of *Dosha*. From fourth stage onwards, they are called as stages of the disease. Among later three stages *Sthansamshrayavastha* has the prime importance because interaction between *Dosha* and *Dushya* start to at this stage. If no treatment is adopted even at the stage of *Prasara* the *Dosha* while moving throughout the body would settle in the part of the body where there is pre-existing *Khavaigunya*. The premonitory clinical features are only manifested at this stage. This stage is called *Poorvarupavastha*. No specific *Poorvarupas* have been described for *Vatavyadhis* and *Gridhrasi* in particular by *Acharyas* but have stated that the same clinical features will be manifested in an unclear (*Avyaktha*) form in this stage of *Poorvarupa*. In *Gridhrasi*, backache or lumbago are observed to occur in this stage.

It is an important pathological phenomenon which underlines different *vatavyadhis* and is a result of active vitiation of *Vata Dosha*. *Gatatva* denotes the *Gati* of vitiated *Vayu* to the place where *Khavaigunya* is available and due to which *Dosha* gets enlodgement there. During the disease process, in the 4th *Kriyakala* i.e. *Sthansamshraya* is the stage where

Poorvaroopa are manifested. These prodromal symptoms are produced due to the accumulation of the *Doshas*, at the place of *Kha-vaigunya* i.e. *Kati* and *Guda Pradesh*. Because of the specificity of *Nidana* which produce affinity in *vata Dosh*a for the vitiation of particular *Sthana* or *Dushya*. After this, the *Doshas* get localized in the impaired *Srotas* and pathology is produced, it leads to structural or functional abnormalities in *Adhithana*, produces a set of symptom.

During *Sthansanshraya Avastha* the vitiated *Dosha* are said to have reached to particular *Sthana* and get obstructed here and intimately mix with and vitiate one, two or more *Dushyas* in that particular portion of body. This is the reason that though *Nidana* of all the called *Vatavyadhi* are same but only due to the *Samprapti Vishesha* of disease *Vata* can produce so many *Vata* disorders. If vitiated *Vata* is accumulated in *Kati* and lower extremities by *srotosanga* it produces *Gridhrasi*.

Vyakta and Bhedavastha

Different abnormalities produced in previous stage leads to production of symptoms of the particular disease is the fifth stage of *Kriya Kala* e.g. *Vyakti*. After *Dosha-Dushya-Sammurcchna* the body channels are cement of impaired by the morbid *Doshos* leading to the bulging of production of specific features of the disease, whereas it is collectively known as *Lakshana-sammucchaya*. On the basis of signs and symptoms diagnosis of the disease is possible. The impairment of *Gridhrasi-nadi* leads to the manifestation of *Gridhrasi* disease. All the *pratyatma Lakshanas* i.e. cardinal features of *Gridhrasi* pertain to either one *Pada* or both *Padas*, Hence the site manifestation of clinical features i.e. *Vyaktasthana* are *Padas* in general. In bilateral sciatica where bowel and bladder are involved the clinical features of those functions also which get manifested. Hence *Mootra* and *Malas* are also to be considered as *Vyakthasthana* rarely in such cases. The movement of one leg is usually impaired in *Gridhrasi*. The movement of the leg is controlled by *Gridhrasinadi* together, its branches and some other *Nadis* of lumbo-sacral plexus. Each movement is controlled by two spinal segments.

Curability and incurability of the disease depends upon the severity of the presenting symptoms. This is the unique stage of the illness, where in it is clearly recognizable as all its characteristic signs and symptoms manifest. At this stage *Gridhrasi* gets manifest completely and can be distinguished according to *Doshik* predominance as *vataja* type or *vatakaphja* type.

Sadhyasadhyata of *Gridhrasi*

If all the *Vata Vyadhi* neglected or after a certain period of time become *Asadhya* or Generally, it is seen that *Gridhrasi* if given proper treatment and if proper diet is mentioned together with *Nidana Parivarjana* is though not completely incurable is usually also not *Sukhasadhya*. It is usually *Kashtasadhya*. Also, it is observed that *Vata-Kaphaj Gridhrasi* is easily curable as compared to pure *Vataj Gridhrasi*.^[24]

Diagnosis

This can be clearly diagnosed clearly by complete medical history including review sings, symptoms and physical examination like straight leg raising test. Other improved diagnostic tests like

- Physical examination
- x-rays,
- magnetic resonance imaging (MRI),
- electromyography,
- myelogram etc will give the accurate cause of sciatica.
- C.S.F.Test

Management of *Gridhrasi*

➤ According to Modern

There are wide ranges of treatment for sciatica. The main aim of treatment is to decrease pain and increase the mobility. The treatment often includes.

1 Limited rest-these advices to stay away from hectic works, prolong sitting, standing and weight lifting etc.

2 Physical therapy-exercises which strengthens the back muscles thigh muscles and abdominal pain and swelling,

3 Medicines-pain medicines and Anti-inflammatory drug that which helps to reduce the pain, inflammation and stiffness. They includes non- steroidal Anti-inflammatory drug (NSAIDs) like aspirin, ibuprofen, naproxen etc. Muscle relaxants like cyclobenzaprine are also given.

4 Spinal injections-an injection of cortisone into lower back region might help to reduce this might be needed for those who do not respond to conservative treatment, and have progressing symptoms. They include microdiscectomy and laminectomy.

According to Ayurveda

There is wide range of treatments, which includes.^[22-24]

- 1) *Siravedha*-venesection
- 2) *Agnikarma*-chemical cotrisation
- 3) *Abhyanga*- Ayurvedic massage with medicated oils
- 4) *Swedana*- medicated fomentation
- 5) *Basti*- therapeutic enema
- 6) *Lepa*-external application of drugs
- 7) Internal medicines-different kind of decoctions, Tablets and powders which decreases
- 8) *Vaata Dosha*.

Ayurvedic Herbs for Sciatica

According to Ayurveda, Sciatica is usually caused by an increase or aggravation of “*vata dosha*”. Following herbs are used for pain management:

Sciatica pain treated with help of Nirgundi (*Vitex negundo*), Guggulu (*Commiphora wightii*) Eranda roots (*Ricinus communis*), Ashwagandha (*Withania somnifera*), Long Pepper (*Piper longum*), Jaiphal (Nutmeg/ *Myristica fragrans*).

Nirgundi (*Vitex negundo*)^[25-27] – is an effective herb for pacifying *vata* nerves and joints. It has been used since a long time to reduce inflammation and swelling of joints. *Nirgundi* decoction is used for steam bath for arthritis, joint pains and sciatica. It is particularly very effective in alleviating back pain.

Therapeutic use -Anti-inflammatory.

Mechanism of Action According to Useful part

Leaves: The leaves of *Vitex negundo* Linn. Are Antibacterial, Antitumor, Astringent, febrifuge, Sedative, tonic and Vermifuge. They are useful in dispersing swellings of the joints from acute rheumatism. Leaves are Anti parasitical, alterative, aromatic, vermifuge, pain reliever. Leaves are insect repellents. Extracts of the leaves have insecticidal activity.

Fruit-The fruit is also used in the treatment of angina, colds, coughs, rheumatic difficulties etc. The fresh berries are pounded to a pulp and used in the form of a tincture for the relief of paralysis, pains in the limbs, weakness etc.

2) Guggulu (*Commiphora wightii*)

Known as one of the oldest remedies, this herb is the best treatment for lower back pain. It nourishes the muscles and tissues of the back naturally. It provides strength and support to the bones and muscles.

Parts Used: Whole Plant

Therapeutic use - Anti-inflammatory.

3) Eranda roots (*Ricinus communis*) – this herb is useful in all painful conditions including rheumatoid arthritis, osteoarthritis, and severe joint pains and also for gynecological disorders. A decoction of the root and root bark is used to treat sciatica. *Eranda skheera paka* is a medicine prepared with seeds of *eranda* and is processed in milk. This can be taken under physician's advice for pain relief.

4) Ashwagandha (*Withania somnifera*) – by infusing it in sesame oil, *Ashwagandha* must be rubbed onto painful arthritic joints and frozen shoulders. It is effective in easing nerve pain such as sciatica, numbness, muscle spasm and back pain. The herb's root contains steroidal properties which can be effective in treating inflammation. It is known to remove the *vata* symptoms that are the initiate the pain.

Part Used- Root.

Therapeutic use- Anti-Inflammatory.

5) Long Pepper (*Piper longum*) – Seeds of this herb must be boiled in water and the liquid should be strained. This mixed with powdered camphor and ground ginger should be applied over the affected areas to help relieve the pain.

Therapeutic use - Anti-inflammatory, Anti-arthritic activity.

6) Jaiphal (Nutmeg/*Myristica fragrans*) – This is a *kapha* and *vata dosha* suppressant herb. *Jaiphal* should be coarsely powdered and then fried in sesame oil until it turns brown. Massage this oil gently over the affected parts to get relief from neuralgia, rheumatism and sciatica.

Therapeutic use - Anti-inflammator.

CONCLUSION

Sciatica is a kind of neuralgia characterized by intense pain and tenderness along the course of the body's longest nerve (sciatic nerve) extending from back to the thigh down to calf region then down towards foot and toes. According to Ayurveda, Sciatica is usually caused by an increase or aggravation of "vata dosha". *Nirgundi, Guggulu, Eranda roots, Ashwagandha, Long Pepper, Jaiphal* herbs serve as alternative home treatment options for sciatica pain.

REFERENCES

- 1 Raja Radha Kanta Deva edited shadba Kalpadruma, 2nd volume, Edition :1988, Pub publisher, Delhi, 555: 345.
- 2 Charaka Sutra Sthana 20/11 charaka Samhita, Ayurveda Deepika, Yadavji Trikamji, Reprint Edition, Varanasi, Chaukhamba Orientalia, 2009; 113.
- 3 Charaka Chikitsa Sthana 28/56 Charaka Samhita, Ayurveda Deepika, Yadavji Trikamji, Reprint Edition, Varanasi, Chaukhamba Orientalia, 2009; 619.
- 4 Sushruta Nidana Sthana 1/5-8 Sushruta Samhita Nibandha Sangraha, Yadavii Trikamji Reprint edition varanasi, Chaukhamba surbharii Prakashana, 2010; 257.
- 5 Harita Samhita chikitsasthana 5/ Harita Samhita, with Hari Hindi vyakhya by Pandit Hariprasad Tripathi Varanasi Chaukhambha Krishnadas Academy, first edition, 2005.
- 6 Agnivesh Charaka Samhita, Vidyotini hindi commentary by K.N. Shashtri and G. N. Chaturvedi. 18th edition Chaukhambha Bharti Academy, Varanasi, Chikitsa Sthana, 28(56): 787.
- 7 Anna Moreshwar Kunte, Krsna Ramchandra, Shastri Navre Astangahrdaya of Vagbhata, Nidana Sthana, (6th edn), Chaukhamba Sanskrit Sansthan, Varanasi, India, 1939; 443-444.
- 8 Priyavrat sharma (2005) Charak Samhita, Chikitsa Sthana. (7th edn), Vol 2, 28/15-17. Chaukhambha Orientalia, Varanasi, India, pp. 462] and Bhavaprakasha.
- 9 Pandit Sri Brahma, Sankara Misra Bhavprakash, Uttarardh, Chikitsa Prakaran. (7th edn), 24/1-3, Chaukhambha Sanskrit Sansthan, Varanasi, India, 2000; 227.
- 10 Priyavrat sharma Charak Samhita, Chikitsa Sthana. (7th edn), Vol 2, 28/59, Chaukhambha Orientalia, Varanasi, India, 2005; 467.
- 11 Charaka Sutra Sthana 1/57 Charaka Samhita, Ayurveda Deepika, Yadavii Trikami Reprint Edition 2009, Varanasi, Chaukhamba Orientalia p16.

- 12 Sharngadhara samhita purvakhanda S/43 Sharangdhara Samhita Deepika vyakhaya Brahmanand Tripathi Reprint edition 2010 varanasi, Chaukhmbha Publishing house p 60.
- 13 Sushruta Sutra Sthana 15/1 Sushruta Samhita Nibandha Sangraha, Yadavii Trikamji Reprint edition Varanasi, Chaukhamba surbharti Prakashana, 2010; 67 25.
- 14 Charaka Chikitsa Sthana 28/1 Charaka Samhita Ayurveda Deepika, Yadavji Trikamji, Reprint Edition 26 Ct 2009, Varanasi, Chaukhamba Orientalia, p 616 .
- 15 Sushruta Nidana Sthana 1/5-8 Sushruta Samhita Nibandha Sangraha, Yadavii Trikamji Reprint edition Varanasi, Chaukhamba surbharti Prakashana p., 2010; 27: Ch 257.
- 16 Charaka Samhita (Agnivesh) Part 2- charaka chandrika Hindi Commentary by, Shree Satyanarayan Shastri, Published by Chaukhamba Bharti Academy, Gokul Bhawan, Gopal Mandi Lane, Varanasi, Reprint, 2013; 787.
- 17 Kaya Chikitsa (third part), Prof. Ajay Kumar Sharma, Chaukhamba Orientalis, Delhi, reprint, 2009; 31.
- 18 Ashtanga Hridaya Sutra Sthana 12/19 Ashtanga Hridayam, Nirmala vyakhaya, Dr. Brahmanand Tripathi, Reprint Edition Varanasi, Chaukhambha Sanskrit Pratishthan, 2009; 193.
- 19 sushruta Sutra sthana 21/28 Sushruta Samhita. Nibandha Sangraha, Yadavii Trikamji Reprint edition Varanasi, Chaukhamba surbharti Prakashanap, 2010; 104.
- 20 Sushruta Sutra Sthana 21/36 Sushruta Samhita Nibandha Sangraha, Yadavii Trikamji Reprint edition Varanasi, Chaukhamba surbharti Prakashana, 2010; 107.
- 21 Charaka Chikitsa Sthana 28/56 Charaka Samhita, Ayurveda Deepika, Yadavii Trikamji, Reprint Edition, Varanasi, Chaukhamba Orientalia, 2009; 619.
- 22 Charaka Samhita (Agnivesh) Part 2- charaka chandrika Hindi Commentary by brhmanand tripathii, prabhakar janardan deshpande, Published by Chaukhamba Bharti Academy, Gokul Bhawan, Gopal Mandi Lane, Varanasi, 2009; 951,952,953,956.
- 23 Astanga hridaya (vagbhata) - vidyotani Hindi Commentary by kaviraj atridevgupt,viadya yadunandana upadhyaya, Published by Chaukhamba Bharti Academy, Gokul Bhawan, Gopal Mandi Lane, Varanasi, 2011; 12: 216.
- 24 Sushruta samhita(sushurta) part 1- ayurved tatva sandipika hindi commentary by ambika data shastri, pranjivan maanik chand Mehta, Published by Chaukhamba Bharti Academy, Gokul Bhawan, Gopal Mandi Lane, Varanasi, 2010; 43: 303 nidaan sthan.
- 25 http://www.ayurvedaconsultants.com/herb_consult.aspxcommonName=NIRGUNDI accessed on Nov 2010.

- 26 Bansod MS, Harle UN, Vitex negundo L: Phytochemical constituents, traditional uses and pharmacological properties:Comprehensive review, Pharmacologyonline Newsletter, 2009; 1: 286-30.
- 27 Mahalakshmi R, Rajesh P, Ramesh N, Balsubramanian V, Kanan VR.Hepatoprotective activity on Vitex negundo Linn. (verbanaceae) by using wistar albino rats in ibuprofen induced model.International journal of pharmacology, 2010; 1-6.