

A critical Review of Asthishrunkhala (Cissus Quadrangularis) in classical and Modern Literature

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Corresponding Author: Vd. Sharad Bharat Dadhich, PG Scholar, Shree Saptashrungi Ayurveda College and Hospital, Hirawadi, Panchavati, Nashik, Maharashtra, India**Conflicts of Interest:** Nil**Introduction****Samhita Kala**

A. **Sushruta Samhita:** lakshadi guggul containing Asthisamharaka is described in Asthibhagna chikitsa as bone tonic or bone setter.

B. **Chakradatta :** Asthisamharaka sidhdha ghrita is described in Asthiroga chikitsa

Sanghrraha kala

A. **Bhavprakash:** Mentioned Asthisamharaka in Guduchyadi varga and also mentioned in Vaatroga chikitsa

Nighantu kal

A. Compilations of nighantus were a revolutionary progression after a long time interval. Huge number of different varieties of many plants with their synonyms, guna, karma and therapeutical actions has been described in well mannered order.

B. Shodhal Nighantu: In this nighantu Asthisamharaka has been described in treatment of Urustambha and various vat vyadhi.

C. Madanpal Nighantu : In this nighantu it is included in Abhayadi varga and mentioned various synonyms according to karma. Also mentioned Properties e.g. – Arshgna, Krimighna, Asthibhagna etc

मदनपाल निघण्टु

अस्थिसंहाको वज्रवल्लरी क्रोष्टुघण्टिका ।

वज्रान्डीः ग्रंथिमान्वज्रप्रोक्ता स्यादस्थिश्रखला ।

अस्थिसंहारकः शीतो वृष्यो वातहरोऽस्थियुक् ॥३२१॥

Kaiydev Nighantu: In this nighantu Asthisamharaka is described balya and various names and synonyms are described in it according to its morphological character and uses.

कैयदेव निघण्टु ओषधि वर्ग

वज्रप्रोक्तास्थिसंहरो वज्रांगी कोष्ठुघंटिका ॥ १५९३

अस्थिश्रुद्धालिका ज्ञेया ग्रथिला वज्रवल्लरी ।

वज्रवल्ली सरा रुक्षा कुमिदुर्नामनाशिनी ॥ १५९४

दीपन्युष्णा विपकेच स्याद्धी वृष्या बलप्रदा ।

अस्थिसंघानजननी वातश्लेष्महर गुरुः ॥ १५९५ (कैयदेव निघण्टु ओषधिवर्ग)

Nighantu Adarsh: In this nighantu acharya bapalal vaidya has included Asthisamharaka Drakshadi gana and also given its uses according to various nighantu and samhitas.

Priy Nighantu: In this nighantu Asthisamharaka has been described as bone healer , vaat nashaka properties.

प्रि.नि.

अस्थिसंयोजकः ख्यातो वल्लीरूपोऽस्थिश्रुन्खडला ।
तत्काण्डं पर्वयुक्तं स्यात् चतुष्कोणं प्ररोहणम् ॥५७॥
अस्थिश्रुन्खडलिका चोष्णा वातश्लेष्महरी सरा ।
वातव्याधिहरी प्रोक्ता त्वस्थिसन्धान्करिणी ॥५८॥

प्रि. नि.

Nighantu Ratnakar: In this nighantu Asthisamharaka has been included in guduchyadi varga and various types of Asthisamharaka. E.g. – Tridhara, Dwidhara, Charadhara.

भावप्रकाश निघण्टु
ग्रन्थिमानस्थिसंहारीवज्रान्डीवाऽस्थिश्रृन्खडला ।
अस्थिसंहारकः प्रोक्तो वातश्लेष्महरोऽस्थियुक् ।
उष्णः सरः कृमिघ्नश्च दुर्नामघ्नोऽक्षिरोगजित् ॥
रुक्षः स्वादुः लघुः वृष्यः पाचनः पित्तलःस्मृतः ।

Shaligram Nighantu: In this nighantu Asthissamharaka in Guduchyadi varga and also uses. e.g. Krumighna , arshohar, baldayak, agnidipak, viryajanak.

Vaidya Manorama : Described Vajravalli Ghrita in putrajanan.

Modern Era: In modern era most of the botanists have scientifically explained the pharmacological and morphological description of the plant and its taxonomical classification. The drug Asthisamharaka has been described by them as follows-

A. The wealth of India

In this book the complete description regarding cultivation , morphology, varieties, properties and use of the plant Asthisamharaka has been explained very well also the properties, chemical Constituents and use of Asthisamharaka has been described.

B. Indian herbal pharmacopoeia

In this book the vernacular names of drug Asthisamharaka have been collected then the book gives complete description about Microscopic characters, microscopic, chemical constituents, identity test, adulterants, qualitative standards. Pharmacology and safety aspect of Asthisamharaka. (Published by Indian drug manufacturer association)

Synonyms

Synonyms are the method adopted by ancient Acharyas to know the accurate and specific description of drug in detail regarding its morphological characters, properties, therapeutic action etc. Synonyms of Asthisamharaka have been described in text according to various nighantus

PARYAY	S.N.	R.N.	P.N.	B.P.	K.N.	M.N.	N.A.
Asthisamharaka	+	-		+	+	+	+
Hadsanhari	-	-		+			
Asthisamhari	+	-		+			

Vajrangi	+	-		+	+		
Asthishrunkhala	+	-	+	+	+	+	+
Vajravalli	+	-					+
Kulish	+	-					
Shiralak	+	-					
Amar	+	-					
Koshtugantica	+	-		+			
Asthisanjyajak	-	-	+		+		
Vajraprokta	-	-		+			
Granthila	-	-		+			
Asthithul	-	-			+		
Kandvalli	+	-					
Hadshankari	+	-					
Granthiman						+	+

The art of naming plant in Ayurveda is very interesting and appreciable. It is based on historical and botanical characteristic features of the plant. Meanings of paryay names of Asthishrunkhala are as follows

1. Vajravalli – Strong As Vajra And Long As Vela.
2. Hadjod – Used In Joining Bones.
3. Vrukshavalli – Climbes In Tree.
4. Asthishrunkhala- Asthi Sandhan.
5. Haadsandhari – Used In Fractues.
6. Hadshankari – Same as Shankal.
7. Tridhara – It Has 3 Edges.
8. Chardhara – It Has 4 Egdes.
9. Granthiman- Granthi Seen After Every 4 – 6 Fingers

Ras Panchak

Asthisamharaka are sweet(Madhura) and pungent (katu) in taste (rasa), in post digestive effect(Vipak) is madhur and has hot (ushna) potency (Virya).by the combination of madhur and katu tastes ,it reduces vata and kapha dosha.

Ras Panchak-

Rasa - Katu, Madhura

Guna – Laghu, Ruksa, Sara

Vipak – Madhur

Virya - Ushna

Doshgnata - kapha vataghnwa, pitta wardhak

According To Some of The Important Nighantus/Granthas Ras Panchak Of Asthisamharaka As Follows

No.	Nighantu	Ras	Gun	Virya	Vipak
1.	Bhavprakash Nighantu	Madhur, Katu	Laghu, Ruksha	Ushna	Madhur
2.	Adarsha Nighantu	Kashay, Madhur	Laghu, Ruksha	Ushna	Katu
3.	Kaiyadev Nighantu	Madhur	Guru, Ruksha	Ushna	Katu
4.	Shaligram Nighantu	Madhur	Laghu, Ruksha, Ushna	Ushna	Katu
5.	Madanpal Nighantu	Madhur	Laghu, Ruksha	Ushna	Katu
6.	Priya Nighnatu	Madhur	Guru, Ruksha	Ushna	Madhur
7.	Dravyaguna J.L.N.Shastrri	Madhur	Laghu, Ruksha	Ushna	Katu

Rogagnata of Asthishrunlhala according to various Nighnatu as follows

No.	Nighantu	Karma	Rogagnata
1.	Shodhal Nighantu	Sandhankar	Urustambh, Vaatvyadhi, Asthibhagna
2.	Madanpal Nighantu	Vrushya, Pachana, Chakshushya, Sandhaniya, Dipan, Anuloman, Vaathar, Kaphaghna.	Arsh, Netraroga, Karnaroga, Vaatvyadhhi, Asthibhagna, Raktalatastrav, Pradar, Dourbalya, Krumi , Shwas.
3.	Aadarsh Nighantu	Vaatshleshmahara, Vrushya, Ushna, Dipan Pachan, Pittawardhak	Krumi, Timir, Vatrakta, Apsmar, Arsh
4.	Shaligram Nighantu	Vatkaphanashan, Viryajanan	Asthisandhankar, Adhman, Arsh, Shulhar, Malastambhahar
5.	Bhaavprakash Nighantu	Ruksh, Kaphavata Shamak, Rakta Shodhak, Deepan Pachan, Vrushya	Raktashodhak Sandhaniya, Asthibhagna, Raktadosh Tamakshwas Artrav Vikarpachan Vikar

6.	Kaiyadev Nighantu	Shukral, Balya, Sarak, Asthisandhankar, Vaatkapha Nashka	Krumi, Arsh
7.	Priya Nighantu	Vaatkaphanashak	Asthibhagna, Vaatvyadhi
8.	Dravyaguna J.L.N.Shastrri	Kaphavathara, Vrushya, Pachana, Netrya	Astibhagna, Netra rog, Arsh
9.	API	Dipan, Vatshleshmahara, Asthi Sandhankar, Chakshushya, Vrushya	Asthichyuti, Krumi, Arsha, Asthibhang

Modern Aspect

1. Taxonomic Position :

- Kingdom – Plantae
- Subkingdom – Viridiplantae
- Division – Mgnoliophyta
- Subdivison – Tracheophyta
- Class – Magnoliopsida
- Order – Vitales
- Family – Vitaceae
- Genus – Cissius
- Species – C. quadrangularis

Vernacular Names

Sr. No.	Language	Names
1.	English	Veld grape, devils backbone
2.	Hindi	Hadjod
3.	Marathi	Kandvel
4.	Sanskrit	Vajravalli, Chaturdhara, Kanvalli
5.	Guajarati	Hadsankala
6.	Oriya	Had bhang
7.	Malayalam	Changalam Parande
8.	Kanad	Mangarballi

9.	Tamil	Perandai
10.	Bengali	Hadjora
11.	Urdu	Hathjod
12.	Punjabi	Haddjor

Family Characteristics: - Vitaceae

The Vitaceae are a family of dicotyledonous flowering plants, with 14 genera and 910 known species, including the grapevine and Virginia creeper. The family name is derived from the genus *Vitis*. The name sometimes appears as Vitidaceae, but Vitaceae is a conserved name and therefore has priority over both Vitidaceae and another name sometimes found in the older literature, Ampelidaceae. In the APG III system (2009) onwards, the family is placed in its own order, Vitales. Molecular phylogenetic studies place the Vitales as the most basal clade in the rosids. In the Cronquist system, the family was placed near the family Rhamnaceae in order Rhamnales.

The family is economically important as the berries of *Vitis* species, commonly known as grapes, are an important fruit crop and, when fermented, produce wine.

Botanical Description: *Cissus quadrangularis* is a perennial plant of the grape family. It is also commonly known as Veldt Grape; Devil's Backbone, Asthisamharaka and Hadjod. *Cissus quadrangularis* reaches a height of 1.5 m and has quadrangular-sectioned branches with internodes 8 to 10 cm long and 1.2 to 1.5 cm wide. Along each angle is a leathery edge. Leaves - Toothed trilobe leaves 2 to 5 cm wide appear at the nodes. Each has a tendril emerging from the opposite side of the node.



Figure : *Cissus quadrangularis*

Distribution: Found throughout the hotter parts of India alongside hedges, neighbouring countries like Pakistan, Bangladesh, Srilanka and Malaysia. It can be cultivated in plains coastal areas, jungles and wastelands up to 500 m elevation.

Macroscopic evaluation of Asthisamharaka : Drug occurs as pieces of stem of varying lengths ,stem quadrangular, four winged ,inert nodes at nodes, a tendril occasionally present at nodes, internodes 4-15 cm long and 1-2 cm thick, surface smooth ,glabrous, buff coloured with greenish tinge, angular portion reddish brown, no taste odour.

Microscopic evaluation of Asthisamharaka : Mature stem shows squarish out line with prominent projection at each anular point, epidermis single layer ,covered externally with thick cuticale,epidermal cells thin walled rectangular tangentially elongated, followed by 2-3 layer of cork and single layered cork cambium, cortex composed of collenchymatous cells present in all the four angular point embedded in cortical region like as umbrella arching over large vascular bundles varying in size arrange in in the form of a ring separated by rays of parenchyma, 3-4 vascular bundles larger in size.

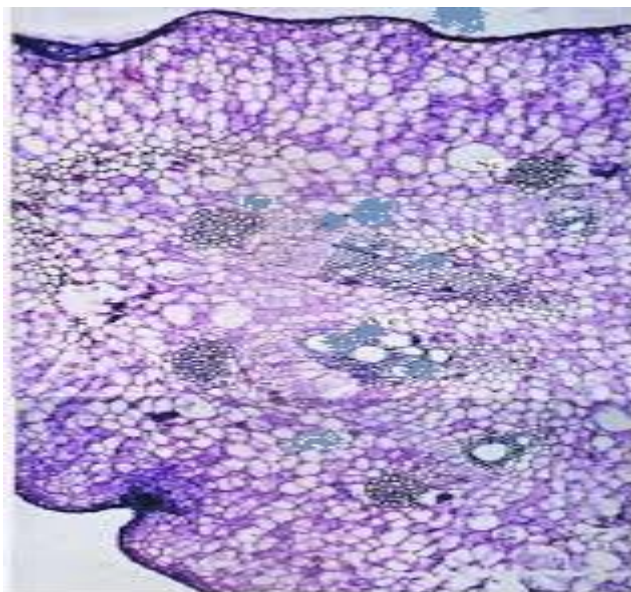


Figure : T.S. of stem Asthishrunkhala

In each angular region, below collenchymatous patch, while rest of bundles smaller in size ,vascular bundle collateral and open type capped by a sclerenchymatous sheath which is well developed in larger bundle, cambium and interfascicular cambium quite distinct central region occupied by a wide pith composed of thin walled, circular to oval parenchymatous cells, idioblasts containing raphides and isolated acicular crystals of calcium oxalate present in the outer region cortex and also in a number of cell throughout the region, rosette crystal of calcium oxalate also found in most of the cell in cortical region ,starch grains present throughout the cortical and pith regions .

Powder :- Brown, shows fragments of vessels, fibers parenchymatous cells and a few rosette crystals of calcium oxalate, starch, grains and idioblasts containing raphides and isolated acicular crystal of calcium oxalate.

Identity, Purity and Strength

Foreign matter	Not more than 2%	Appendix 2.2.2
Total ash	Not more than 22 %	Appendix 2.2.3
Acid insoluble ash	Not more than 1.5 %	Appendix 2.2.4
Alcohol-soluble extractive	Not less than 4 %	Appendix 2.2.6
Water soluble extractive	Not less than 20%	Appendix 2.2.7

(API Part – I Vol.3 First Edition)

Chemical Constituents: The botanical name of Asthisamharaka is “Cissus quadrangularis linn” and it belongs to family “Vitaceae”.

1. Calcium oxalate
2. Carotene
3. Ascorbic acid
4. Triterpenoids
5. Traaxerol
6. Sitosterol

Pharmacological Studies: Pharmacology following the folk and traditional uses of *Cissus Quadrangularis*, it is being investigated scientifically to confirm its potentiality to cure and treat various diseases.

1. Anti inflammatory activity
2. Anti Osteoporotic activity
3. Anti haemorrhoidal activity
4. Gastro protective activity
5. Antioxidant
6. Bone healing activity
7. Antibacterial activity

1. Anti inflammatory activity - Flavanoids are inhibiting the inflammatory process. They are inhibitor of lipooxygenase especially luteolin, which is compound of *C. quadrangularis* L. is known to be inhibitor. The anti-inflammatory activity of β - sit sterol was demonstrated to have an inhibitory effect on edema induced by both carrageens and arachidonic acid. It is suggested that *C. quadrangularis* L. is dual inhibitor of arachidonic acid metabolism.

2. Anti Osteoporotic activity - *C. quadrangularis* L. has been reported in Ayurveda for its anti-osteoporotic activity. The phytoestrogen rich fraction (IND- HE) from the aerial parts of plant shows its activity. Plant contains phytoestrogen and triterpenoids. The phytoestrogen steroids isolated plant shows influence on early regeneration and quick mineralization of bone. The ethanolic and petroleum ether extract of *C. quadrangularis* L. shows prominent effect. Various studies confirms the anti-osteoporotic activity and phytoestrogen rich fraction (IND- HE) of *C. quadrangularis* L. increased blood calcium level, Vitamin D3, Serum estrogen, bone mineral density and bone mineral content. There is significant increase in bone thickness, bone density and bone hardness. it also significantly inhibits the anti-anabolic effect and exerts some beneficial effects on recovery of bone mineral density. The ethanolic extract of *C. quadrangularis* L. shows ethanol extract of the plant had definite anti-osteoporotic effect.

3. Anti haemorrhoidal activity – Phytochemical study of *C. quadrangularis* L. revealed that its major compounds are flavanoides. The bioflavonoides. Particularly diosmin, hesperidin complex have demonstrated potential in the treatment of hemorrhoids. This bioflavonoides exhibit phlebotonic activity, venotonic activity, vasculo protective effects and antagonistic effect on biochemical mediator of inflammation. The extract of *C. quadrangularis* L. produce same activity can also be used as anti haemorrhoidal drug. The herb also possesses analgesic effect which is very useful in painful hemorrhoids. The plant also used as an anti-haemorrhoidal drug in their folk medicine.

Important Medicinal Properties / Biomedical Action

Cissus Quadrangularis is rich in medicinal properties. The understanding of these properties will help us to better utilize this herb. These also indicate the conditions in which we should avoid it.

Below is given medicinal properties along with the meaning.

Analgesic: Acting to relieve pain.

Anti-inflammatory: Reducing inflammation by acting on body mechanisms.

Antiosteoporotic: Countering osteoporosis, whole plant possesses antiosteoporotic activity.

Antioxidant: Exhibits strong antioxidant and free radical scavenging activity.

Anti-ulcer: Significant antiulcer activity by decreasing gastric secretions and by enhancing glycoprotein levels.

Bone healing: Due to rich content of calcium, phosphorous and phytoestrogenic steroids it is shown to influence early regeneration and quick mineralization of bone fracture healing process.

Central nervous system activity: The root extract possesses central nervous system depressant activity.

Central nervous system activity: The root extract possesses central nervous system depressant activity.

Asthishrunkhala Health Benefits

It strengthens the bones.

It hastens the fracture healing.

It reduces swelling.

It reduces fracture pain.

It is used both internally and externally. The paste is applied topically on fracture for better healing. The paste of herb on local application to the fractured area in shows reduction in total healing time of fracture.

It helps in reducing pain, swelling, and fracture mobility and accelerate the healing of fracture jaw bones.

Stem is useful in the treatment of piles and its juice is used to treat bleeding of nose.

It supports accumulation and precipitation of calcium from blood for bone recovery.

The other medicinal uses of Asthishrunkhala include treating digestive disorders, asthma, indigestion, skin diseases and irregular menstruation. It is also useful in obesity management and complications of metabolic disorders. Asthishrunkhala or *Cissus quadrangularis* has potent fracture healing property. It has antimicrobial, antiulcer, antioxidant, anti-osteoporotic, gastro-protective, cholinergic activity.

Cissus quadrangularis for Weight loss

Cissus quadrangularis formulation helps in weight loss and metabolic syndrome, particularly for central obesity.

It controls and lowers triglyceride concentrations, total cholesterol, LDL-cholesterol, and fasting blood glucose. It enhances satiation by increasing serum serotonin levels.

The phytosterols and fiber have lipase inhibitor action. Lipase inhibitors are substances used to reduce the activity of lipases found in the intestine. Lipases are secreted by the pancreas when fat is present. The primary role of lipase inhibitors is to decrease the gastrointestinal absorption of fats. It significantly reduces plasma total cholesterol and LDL cholesterol.

Obese and overweight persons with symptoms of metabolic syndrome should take *Cissus* formulation twice daily. This causes reduction in weight and improvement in the symptoms associated with metabolic syndrome.

For weight loss, 500 mg of supplement is taken twice a day immediately before meals (preferably breakfast and dinner).

External Use

Take 1-2 internode of the stem.

Wash in clean running water.

Cut in pieces. Put in mortar and pestle.

Grind and make pulp.

The pulp is applied at fractured bone with help of bandage. Put some cotton to stop pulp from slipping out of the bandage.

The bandage should be placed in such a manner that the pulp does not slip and remain on the fracture for healing action.

Apply it twice or thrice a day.

Internal Use

Take 1-2 internode of the stem.

Wash in clean running water.

Cut in pieces. Put in mortar and pestle.

Grind and make pulp.

The pulp should be filtered through the cloth to get the juice.

Take about 10 ml of juice and mix in one cup water. Drink one or twice a day.

Contraindications, Interactions, Side-effects and Warnings Cissus Quadrangularis

It is NON-TOXIC.

It is an edible plant and well tolerated.

Study about safety of taking Cissus quadrangular is in pregnancy or breast-feeding is not available. Hence, avoid its use while pregnant and breastfeeding.

It increases Pitta which can cause acid reflux, heartburn etc. in Pitta Prakriti person.

Few side effects of Cissus quadrangular include headaches, excessive gas, sleep problems etc. In some sensitive people, due to its heating and drying action, it may cause such as burning sensation, restlessness, insomnia, dryness, dry mouth, sweating etc.

It may lower blood sugar. Stop using this at least 2 weeks before a scheduled surgery as it lowers blood sugar level.

Person suffering from low blood sugar level should take it with caution.

Specific contraindications have not been identified.

High doses may cause central nervous system depression, sedation, muscle relaxing, skin rashes or allergy.

The paste is sharp pungent and can make scars in soft tissues on touch for long time. So, apply carefully.

Long term safety is unknown as no study has been done.

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