



UNDERSTANDING SHIRISHA (*ALBIZIA LEBBECK L.BENTH*) : A DETAILED DRUG REVIEW

NIRANJANA R N¹, NATARAJ H R²

SONIYA M P³, AKARSHA KRISHNA S⁴

^{1,3,4} PG SCHOLAR, ²ASSOCIATE PROFESSOR

DEPARTMENT OF AGADA TANTRA

SRI DHARMASTHALA MANJUNATHESHWARA COLLEGE OF AYURVEDA AND HOSPITAL,
HASSAN

ABSTRACT

Shirisha (*Albizia lebeck*) holds a significant place in *Ayurveda*, utilized extensively for its medicinal properties across various traditional practices. This review examines its botanical attributes, traditional uses, and pharmacological potentials. Botanically, *Shirisha* is a medium to large deciduous tree, known for its upright stature, spreading crown, and distinctive characteristics such as white to greenish-yellow fragrant flowers and linear oblong pods. It thrives in tropical and subtropical regions of Asia and Africa. In *Ayurveda*, *Shirisha* is revered for its therapeutic benefits in treating conditions like poisoning (including snake bites), infections, and inflammatory disorders. Its efficacy is attributed to a diverse array of phytochemicals including alkaloids, flavonoids, tannins, and saponins, which contribute to its analgesic, anti-inflammatory, antimicrobial, and antioxidant properties. Recent scientific investigations have corroborated several traditional uses of *Shirisha*. Studies highlight its ability to suppress histamine signaling, inhibit microbial growth, reduce inflammation, and enhance antioxidant defenses. Continued research into bioactive constituents and mechanisms of action of *Shirisha* could further elucidate its therapeutic potential and pave the way for its integration into mainstream healthcare practices, bridging the gap between traditional wisdom and contemporary medicine.

Keywords: *Shirisha*, *Vishaghna*, Pharmacology, *Agada*

INTRODUCTION

Ayurveda is a traditional healthcare system of Indian medicine since ancient times. Majority of medicine mentioned in *Ayurveda* are plant based. The overuse of synthetic drugs, results in higher incidence of adverse reaction, has motivated humans to return to nature for safer remedies. *Ayurveda* totally depends upon *Chikitsa Chatushpada*, they are *Bhishak* (physician), *Upasthatha* (Medical Attendant), *Rogi* (patient) and *Dravya* (medicine). According to *Acharya Charaka*, the *ausadi* to be

administered to the patient should possess the following four ideal qualities. *Bahuta* (It should be available in abundant quantity), *Yogyatam* (It should be effective), *Aanekvidha Kalpana* (Various pharmaceutical forms or multiple use), *Sampat* (Richness in efficacy or potency) and *Shirisha* fulfilled all these four qualities. *Acharya Charaka* also quote the *Shirisha* “*Visghananaam Srestho*”. All parts of *Shirisha* are extensively used as a general and universal antidote in traditional medicine. The present review is about *Shirisha (Albizia lebbbeck)* plant which is important herbal drug in various aspects like chemical constituent, pharmacological activity and being used traditionally for longer period of time¹.

Taxonomy:

Botanical name : *Albizia lebbbeck. L Benth*

Family : Fabaceae

Authority : Benth

Synonyms: *Visha hanta, Madhupushpa, Kapitana, Shyamala, Shukataru, Uddanaka, Barhapushpa, Bhandi, Bhandika, Shirisha* etc.

Vernacular names:

Hindi : Garso, Kalshish, Shirish, Siras, Sirin

English : Parrot tree, Acacia amarilla, EastIndian walnut.

Bengali : Siris, Sirisha

Punjabi : Sirish, Sareehn

Gujarati : Kalosadasado, Kaliosaras, Pilosarashio

Marathi : Chichola, Kalashiras, Mothasiras

Kannada : Bagey, Bage mara, Hombage

Malayala : Kuttuvaka, Nenmani

Tamil : Vakai

Telugu : Dirisena

Nepali : Harrasiris²

Classification:

Charaka	Vishagna varga, Vedanasthapana varga, Mutrasangrahaniya varga
Sushruta	Salasaradi gana
Bh.Pr. Ni	Vatadi varga

Parts Used: Stem Bark, Seeds, Leaves, Flowers, Bark.

Dose:

- Powder –3 to 6 grams per day
- Water decoction –50 to 100ml,
- Fresh juice –10 to 20ml

Distribution & Habitat:

The genus *Albizia* comprises almost 150 species. *Albizia lebbbeck Benth* is a large, erect, unarmed, deciduous spreading tree. Throughout India, usually planted, tropical and subtropical regions of Asia and Africa

Plant Description:

A medium to large sized upright, unarmed, tree grows about 20 m in height with a spreading crown.

- Stem: Branches with grey to dark brown, rough, irregularly cracked, bark young shoots hairless.
- Flower: White to greenish-yellow, fragrant, borne in globose umbellate heads, 2-3.8 cm in diameter, peduncles 3.8-7.5 cm long, solitary or 2-4 together.
- Leaves: Abruptly bipinnate, with glabrous or downy rachises, a large gland near the base of the main petiole, pinnae 4-8, 7-12 cm long, leaflets 5-9 pairs, short-stalked, rigidly subcoriaceous, oblique, 2.5-3.8 cm long.
- Fruit: Pods 10-30 cm long, 2-4.5 cm wide, linear oblong, bluntly pointed, thin, green turning yellow-brown on maturity, smooth, shining reticulately veined.
- Seeds: 4-12, pale brown, ellipsoid, oblong compressed.
- Fruiting: December - February.
- Flowering: April – June ⁴

PROPERTIES:

*Rasa Pancaka*⁵

- *Rasa : Madhura, Tikta, Kasaya,*
- *Guna : Grahi, Laghu, Tikshna*
- *Virya : Anushna*
- *Vipaka : Katu*
- *Doshaghna : Tridoshghna*
- *Prabhava : Vishagna, Tridoshghna*

CHEMICAL CONSTITUENTS

- Leaf - Saponins tanins and two new tri-O-glycoside flavonols, kaempferol and quercetin 3-O- α -rhamnopyranosyl.⁶
- *Beeja* (The beans) - Albiginic acid it's a triterpenoid sapogenin⁷.
- *Twak*(Bark) - Two saponin known as libbekenin A & B, Three Saponin albizia saponins A, B and C [15-17] Condensed tannins (7-11%) & catechin, libbecacidin, isomers of leucocyanidin, friedellin-3-one, acacic acid; Echinocystic acid and β -sitosterol, a saponin - libbekenin C - on acid hydrolysis yielded echinocystic acid, 5glucose and rhamnose. friedelan -3-one (friedelin) and γ -sitosterol from bark⁸.
- *Sara* (Heart wood) - Melanoxetin, d-pinitol, okanin & leucopelargonidin, a stereoisomer (-) melacacidin (7,8,3',4'-tetrahydroxyflavan-3,4- diol), and libbecacidin in addition to melacacidin and melanoxetin, two new compounds – (-)2,3-cis-3,4-cis-3,4- Ω -methylmelacacidin as its methyl ether and 3'-O-methylmelanoxetin-isolated⁹.
- *Moola* (Tap Root) - Saponin are characterized as echinocystic acid-3-O-L-rhamnopyranosyl (1 $\rightarrow$ 5)- β -D-xylofuranosyl (1 $\rightarrow$ 4)- β -D-glucopyranoside¹⁰.

Medicinal Uses

- Usage in poisoning - Its flower is squeezed and juice is extracted. It is triturated with black pepper and sugar and is used for nasal instillation, and for oral intake in snake bites.
- Worm infestation - After enema, intake of *Shirisha* and *Careya arborea* (Wild guava) juice mixed with honey is useful in worm infestation.
Topical application of paste prepared from *Albizia lebbek* (Lebbeck tree) seed and *Piper longum* powder triturated with *Calotropis procera* latex is

useful in snakebite, spider sting, insect poisoning, rat poisoning and scorpion sting.

- Snake poisoning - Snuff and collyrium of white variety of *Piper nigrum* (Black pepper) powder triturated with *Albizia lebbbeck* (Lebbeck tree) flower juice is useful in snake poisoning. Topical application of paste or powder prepared from an equal quantity of *Cassia fistula* leaves, *Cordia myxa* bark, *Albizia lebbbeck* flower and *Solanum nigrum* is useful in erysipelas.
- Rat poisoning - Intake of powder prepared from *Albizia lebbbeck* (Lebbeck tree) extract, flower, fruit and bark along with honey is useful in emaciation, insomnia and pericarditis caused due to rat poisoning.
- Ksharagada - Paana, Nasya, Abhyanga, Lepa* of *Twak* of *Shirisha* is used in *Jangama, Sthavara, Sarva Vishanashaka*.
- Parama Agada - Twak* is used in *Sthavara, Jangama as Paana, Nasya, Anjana*.
- Mahagandhahasti Agada - Panchanga* is used for *Mushika Damsha, Luta Damsha, Sarpa Damsha, Mula* and *Kanda Visha* in the form of *Paana*
- Dhoomagada - Pushpa* is highly significant in the cases of *Keeta Damsha*. In *Mashaka Damsha, Dhooma* to fumigate the home.
- Sarvakarmika Agada - In Luta Visha, Beeja* is used as *Paana, Nasya, Anjana, Lepa*.

Folk Medicine:

Folk remedial claims of *Shirisha*, according to Hartwell (1967–1971) is the tree is used for boils, cough, eye ailments, flu, and lung ailments, for abdominal tumor, in bowel enemas. It is reported as an astringent, pectoral, rejuvenant, and tonic. The seed oil is effective in leprosy. Seed powder is useful in scrofulous swellings. Indians use the flowers in the condition of abnormally frequent and involuntary no orgasmic emission of semen.¹¹

OTHER USES OF DIFFERENT PART OF SHIRISHA

- Shirisha Beeja* is used in *Dantha kashta* (tooth brush twigs), In *Visha Chikitsa as Prathisarana*. *Shirisha Twak* (bark), *Phala* (fruits) and *Sara* (heart wood) is used for *Lepa* (ointments), *Paana* (internal medication) and *Anjana* in different types of *Mushika damsha* (rat bites) like *Putraka, Krishna and Kashaya danta*. Similarly, *Phala* is used for *Vamana* (emesis) and *Sara* (heart wood) is used for *Shirovirechana* (*Nasya*).
- In *Keeta visha chikitsa* (Insect poisoning), *Shirisha Twak* (bark) is used for *Paana* (internal medication) and *Lepa chikitsa* (ointments), *Alepa* (external application) and *Seka*. In *Pitta Pradhana Luta Damsha* (spider bites), *Shirisha Twak* (bark) is used for both *Paana* (internal medication) and *Lepa* (ointment).
- As *Prathisarana* (rubbing), *Shirisha Twak* is used in *Vishadagdha Vrana* (wound caused by poisoned arrows or Weapons). White pepper triturated with the juice of flowers of *Shirisha* is considered to be best among all types of treatment for *Sarpa dashta* (snake bites).

- In case of *Vrishchika* (scorpion bites) *Chikitsa Shirisha Phala* (fruit), *Pushpa* (flowers) and *Beeja* (seeds) are used in different forms like *Paana* (internal medication), *Anjana* (collyrium) and *Lepa* (ointment). Especially in *Ratri* (night), *Vrishchika* (scorpion bites) *chikitsa- Pushpa* (flowers) and *Beeja* (seeds) are considered to be best.
- In *Luta* (spider bite) *Chikitsa, Shirisha Twak* and *Phala* is used for *Lepa* and *Paana*. *Shirisha Sara* and *Phala* (fruits) are utilised for *Shirovirechana* (*Nasya*) in *Bhujanga* (snake bites), *Luta* (spider bites), and *Undhura* (mice).
- In *Mushika* (rat bites) *Damsha Shirisha Beeja* (seed) is considered to be the best.¹²

Recent research Works

In *Visha Damsha* conditions, *Sthanika Chikitsa* (local external treatment) plays an important role to reduce the pain, itching and inflammation at the site. *Shirisha* is best *Vedanasthapaka* (analgesic), *Shothaghna* (antoinflammatory), *Vrana Ropaka*, *Vishaghna* (anti-toxic) and *Tridosha Shamaka*.

Phytochemical screening of successive extracts of *Albizia lebbeck* leaves shows presence of carbohydrates, alkaloids, tannin, flavonoids, terpenoids, coumarins, glycosides, phenolics, and saponins. The presence of these phyto-constituents makes them an efficacious herbal drug. After several experimental model & clinical trial multidimensional activity of *Shirisha* like analgesic, anti-inflammatory, anti-allergic, anti-bacterial, antifungal, antiprotozoal, anticonvulsant, anti-anaphylactic, antioxidative is proved¹³.

- **Anti allergic activity:**

One of the study carried on rats investigated that the extract of bark of *Albizia lebbeck* suppress histamine signalling genes H1R and histidine decarboxylase(HDC). This genes are allergic disease sensitive genes and their expression level effect severity of the allergic symptoms¹⁴.

- **Antimicrobial screening:**

Active compound isolated from stem bark showed that the total glycosides, cardenolide glycoside and anthraquinone glycosides were active against the test cultures¹⁵.

- **Anticonvulsive activity:**

Leaves of *Albizia lebbeck* showed anticonvulsive activity against seizures induced by maximal electroshock, lithium-pilocarpine in laboratory animals. The saponins of *Albizia lebbeck* possess nootropic activity¹⁶.

- **Anti-inflammatory activity:**

An experimental study on petroleum ether, ethyl acetate, the methanol extract of *Albizia lebbeck* bark was carried on carrageenan-induced paw edema in mice. The extract at the dose of 400mg/kg/BW was given and 36-68% inhibition of edema volume at the end of 4hr was observed¹⁷.

- **Anti-fungal activity:**

The anti-fungal activity of lebbeckalysin was screened with an agar diffusion assay. Two hundred micrograms of lebbeckalysin were added to test its inhibitory effect on different fungi. The IC 50 value for the anti-fungal activity of lebbeckalysin against *Rhizoctonia solani* (pathogenic fungus) was determined¹⁸.

- **Immuno-modulating activity:**

The study affirms that ethanolic extract of the *Shirishadi* compound is an effective immunomodulatory agent. The effectiveness of extract-treated animals in overcoming the side-effects of CP induced immunosuppression provides evidence for balancing and adaptogenic effectiveness of extract. The extract potentiated the non-specific immune response. Increase in percentage of neutrophil is attributed to marginalization of phagocytic cells i.e. improved defensive response under normal circumstances¹⁹.

- **Antioxidant properties:**

The bark extracts of *Albizia lebbeck* possess free radical scavenging activity against 1, 1-di diphenyl-2-picrylhydrazyl radical (DPPH) and reducing power assays. Their results on DPPH free radical scavenging at 1000 µg/ml indicated maximum antioxidant activity of 91.82% and 90.08% respectively²⁰.

- **Antipyretic Activity:**

The effects of the different extracts administered at doses of 1 g/kg except the n-butanol extract which was administered at a dose 0.25 g/kg. All of the treatments decreased the body temperature significantly. The maximum decrease of 8°C was shown by the dichloromethane extract²¹.



- **Analgesic Activity:**

The effect of the different extracts of *Albizia lebbeck* on pain sensation was tested using hot plate method. Maximum increases in the pain threshold were observed 90 minutes after administration of each extract²².

- **Antibacterial properties:**

The bark of *Albizia lebbeck* has acrid taste and its extract showed antimicrobial activity. Novel macrocyclic alkaloids (budmunchiamines A, B and C) were isolated from *A.amara*. They were also found to have antiplatelets aggregation and bactericidal activity.²³

DISCUSSION

Shirisha shows that it possesses *Kashaya*, *Tikta Rasa*. *Tikta Rasa* itself is antitoxic in nature & *Kashaya Rasa* help in the healing procedure in bite cases. Apart from *Rasapanchaka*, Toxic and antitoxic drugs act on the basis of their *Prabhava*, which is the known special potency and power the drug. In the cases of poisoning specially in insect bite, snake bite, rat bite symptoms are pain, inflammation & oedema. Phytochemical screening of successive extracts of *Shirisha* leaves shows presence of carbohydrates, alkaloids, tannin, flavonoids and saponins. After several experimental model & clinical trial multi dimensional activity of *Shirisha* like analgesic, anti inflammatory, anti allergic, anti-bacterial, antifungal, antiprotozoal,

anticonvulsant, anti-anaphylactic, antioxidative is proved. This piece of report would promote these species for extensive research, to fetch the optimistic utility of its phytoconstituents for therapeutic applications.

CONCLUSION

Many studies conducted by different branches by using different parts of the plant have proved antimicrobial, analgesic, anti-inflammatory, anti-diarrhoeal, immune - modulatory, antiarthritic, anti-asthmatic, anticonvulsant, anti- allergic, hepatic protective and antioxidant activity of the drug. Thus, it seems to be a promising drug for various activities. In all *Samhitas* various *Yogas* have been mentioned for internal and external use containing *Shirisha* as an ingredient. All the *Yogas* are not in practice and hence there remains scope for further research on these *Yogas*. The present review highlights on the major goal of Ayurveda and their significant role in healthcare system. Therefore exploration of different Ayurvedic herbs can be carried out through experimental studies with their proper documentation. It will be helpful in enhancing the use of herbal drugs like *Shirisha* (*Albizia lebbek*) in general practice and making it globally accepted by humans.

REFERENCES

1. Charak Samhita, with Charak Chandrika Hindi commentary, by Dr. Brahmanand Tripathi and Dr. Ganga Sahay Pandey, Sutra Sthana Chapter 9, Verse 6, Chaukhamba Surbharti Prakashan, 2007. p. 209.
2. Ketan M, Tiwari RC, Pragya S. Shirish (*Albizia lebbek* (L.) Benth.) A drug review. World Journal of Pharmaceutical Research. 2019 Oct 14;8(13):765-77.
3. Tomar S, Jawanjal P. Critical review of *Albizia lebbek*-A multi potent drug. Journal of Ayurvedic and Herbal Medicine. 2019;5(2):76-81.
4. <http://www.interscience.org.u>
5. Acharya YT, editor, Nibandhasangraha Commentry of Sri Dalhanacharya on Sushruta Samhitha of susruta, Kalpa sthana; Annapanarakshakalpa: chapter 1, verse 25-26. Varanasi: Chaukambha surabharati prakashana, 2014.
6. Asolkar LB, Kanitkar KK, Chakre OT. Glossary of Indian medicinal plants with active principle, part 1. CCRAS, New Delhi, 1992, pp.38-39.
7. Tripathi VJ, Ray AB, Dasgupta B. Neutral constituents of *Albizzia lebbek*. Current Science, 1974: 43: 46-48.
8. Shrivastava, K. Saxena, V.K. A new saponin from the roots of *Albizia lebbek*. 1988; 59,479- 480.
9. Agrawal PK, Singh B. Chemical constituents of *Albizia lebbek*. Indian Journal of Pharmaceutical Sciences, 1991;53:24-26.

10. Affandi H, Nuryadin A, Read RW. Studies on natural products of Albizia sp. *Biotropia* 1998; 11:1-8.
11. Jhunjhunwala A, Tiwari RC, Dikshit M, Mittal B, Sharma VB. Shirisha in Agada Tantra. *Journal of Ayurveda and Integrated Medical Sciences*. 2022 Jun 27;7(4):56-61.
12. Agrawal VK, Patil VA, Narode VS. A review of literature on panchashirisha agad:(*Albizia lebbeck* Benth). *World journal of pharmaceutical research*. 2022 Aug 3;11(13):668-75.
13. Choudhary R, Inchulkar SR. Vishaghna (anti-toxic) property of Shirisha (*Albizia lebbeck*): A Review. *Journal of Ayurveda and Integrated Medical Sciences*. 2020 Dec 31;5(06):304-9.
14. Islam MN, Hiroyuki M, Masum S. *Albizia lebbeck* suppresses histamine signaling by the inhibition of histamine H1 receptor and histidine decarboxylase gene transcriptions. *Int Immunopharmacol*. 2011; 1- 7.
15. Ganguli NB, Bhatt RM. Mode of action of active principles from stem bark of *Albizia lebbeck*. *Indian J Experiment Biol*. 1993;31:125-129.
16. Kasture VS, Chopde CT, Deshmukh VK.(2000) *J. Ethnopharmacol*. 71: 65-75.
17. Saha A, Ahmed M. The analgesic and antiinflammatory activities of the extract of *Albizia lebbeck* in animal model. *Pak J Pharm Sci*. 2009;22(1):74-7.
18. Lam SK, Ng, TB. A protein with antiproliferative, antifungal and HIV-1 reverse transcriptase inhibitory activities from caper (*Capparis spinosa*) seeds. *Phytomed*.2009;16:444–450.
19. Divya Kajaria, Immunomodulatory effect of ethanolic extract of Shirishadi compound AYU | Apr-Jun 2012 | Vol 33 | Issue 2.
20. Khatoon, Islam E, Islam R, Rahman AA, Alam AH, Khondkar P, Rashid M, Parvin S. Estimation of total phenol and in vitro antioxidant activity of *Albizia procera* leaves. *BMC Res Notes* 2013; 6: 121.
21. Z. Yongna, R. Wantana, B. Pisit, L. Zhongkun and Z. Rongping, “Analgesic and Antipyretic Activities of the Aqueous Extract of *Urtica macrorrhiza* in Experimental Animals,” *Fitoterapia*, Vol.76,No. 1, 2005, pp. 91-95.
22. A. Saha and M. Ahmed, “The Analgesic and Anti-Inflammatory Activities of the Extract of *Albizia lebbeck* in Animal Model,” *Pakistanian Journal of Pharmaceutical Science*, Vol. 22, No. 1, 2009, pp.74-77.
23. Yadava RN, Tripathi P. Chemical examination and antiinflammatory action of the extract from the stem of *Albizia procera*. *Res J Chem Environ* 2000; 4: 57-60.