

# ALBIZIA LEBBECK-A SYSTEMIC REVIEW

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**Abstract:** Albizia lebeck (AL), often known as shirish has a variety of medicinal characteristics. AL is a valuable plant for both industrial and medical use. The leaves are high in protein and make wonderful feed. The plant contains Saponin, macrocyclic alkaloids, phenolic glycosides, and flavonols are all present. In Ayurvedic medicine is thought to provide an antidote to all kinds of toxins. Many Panchshirish agada, MahagandhahastiAgad are Ayurvedic shirish formulations. Poisoning has been linked to, among other things. It has been shown, however, that no element of the Plants have antidote properties against both shaking and scorpion venoms. Furthermore, theAL bark decoction has anti-anaphylactic and anti-asthmatic properties, and these potentials can be considered supportive measures in the treatment of poisoning. AL saponin was isolated.methanolic pod extract and bark.

## Introduction:

The word albizzia has come from Albizzia an Italian naturalist of the eighteenth century. AL is an exotic species whose invasion is from Australia to India. Its vernacular name is Shirish. There are some common names of AL given below: Hindi-Garso, Siris, Sanskrit-Barhapuspha,Bhandi, Kalinga , Urdu-Darash, West Indies-Woman "Tongue, Brazil-Heart-to-black, Ceylon-Kona, English-Parrot tree French-Acacia lebeck, Bois noir AL is found throughout India, ascending to 13000 m. in the Himalayas[2]. It is widely available plant in the tropical and subtropical Asia and Africa with economic importance for industrial medicinal uses. Acharya Charakaa also quotes about the importance of knowledge of drugs as “Aushadham .....Visham” (Ch. Su. 1/126) i.e. the drug is worthless without appropriate knowledge of its name, morphological identification and specific qualities and if the above criteria have been fulfilled, the knowledge about proper formulation of the same is an indispensable fact for a physician.



## Botanical Classification:

<b>Domain</b>	Eukaryote
<b>Kingdom</b>	Plantae
<b>Subkingdom</b>	Tracheobionta
<b>Superdivision</b>	Spermatophyte
<b>Division</b>	Magnoliophyta
<b>Class</b>	Magnoliopsida
<b>Subclass</b>	Rosidae
<b>Order</b>	Fabales
<b>Family</b>	Fabaceae
<b>Subfamily</b>	Mimosidae
<b>Genus</b>	Albizia
<b>Species</b>	Albizia lebeck

**Taxonomy**

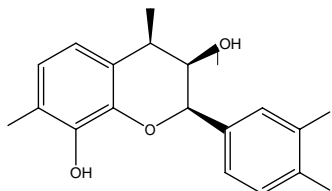
- *Albizia lebbbeck* Linn.
- Family -Mimosaceae.
- Habitat-All over India, from the plains upto 900m in the Himalayas; also in the Andaman's.
- English-Siristree, East Indian walnut.
- Ayurvedic-Shirisha, Bhandi, Bhandila, Shitapushpa, Mridupushpa, Kapitana (bark-dusty black).
- Unani -Siras.
- Siddha/Tamil-Vaagei.
- Action - Antiseptic, antibacterial, anti allergic, anti dermatitis, ant dysenteric.
- Bark- Used in bronchitis; bark and seeds in piles
- Root-In hemicrania
- Flowers- In cough, bronchitis, tropical pulmonary eosinophilia, and asthma.
- Pod- Antiprotozoal.

**Chemical Constituents**

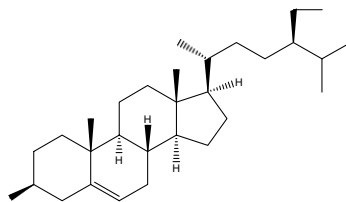
Sr. No.	Part of the plant	Chemical constituents
1	Leaf	Saponin, tannins and two new tri-O-glycoside flavonols, kaempferol and quercetin 3-O- $\alpha$ -rhamnopyranosyl (1'6)- $\alpha$ -glucopyranosyl (1'6)- $\alpha$ -galactopyranosides <sup>[11, 12]</sup> .
2	Pod	7 dimethoxyflavone, 3', 5-dihydroxy-4' and N-benzoyl-L-phenylalaninol <sup>[13]</sup> .
3	<i>Beeja</i> (The beans)	Albigincacid- its a triterpenoid sapogenin <sup>[14]</sup> .
4	<i>Chaal</i> (Plant bark)	two saponin known as libbekenin A & B, Three Saponin albiziasaponins A, B and C <sup>[15-17]</sup> Condensed tannins (7-11%) & d-catechin, libbecacidin, isomers of leucocyanidin, friedellin-3-one, acacic acid; Echinocystic acid and $\beta$ - sitosterol, asaponin-libbekenin C- on acid hydrolysis yielded echinocystic acid, 5 glucose and rhamnose. friedellin-3-one (friedelin) and $\gamma$ -sitosterol from bark <sup>[18-20]</sup>
5	<i>Sara</i> (Heartwood)	Me7lanoxetin, dpinitol, 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, $\Omega$ -methyl-melacacidin as its methylether and 3'-O-methylmelanoxetin) isolated from heart wood <sup>[21]</sup> .
6	<i>Moola</i> (Tap Root)	Saponin are characterized as echinocystic acid-3-O-L-rhamnopyranosyl (1 $\rightarrow$ 5)- $\beta$ -D-xylofuranosyl (1 $\rightarrow$ 4)- $\beta$ -D-glucopyranoside <sup>[22,23]</sup> .
7	Inflorescence	Striterpene, Saponin glycosides, Saponin libbekanin, benzyl benzoate, benzyl acetate, and crocetin libbekanin-D, F, G & H. Flower on stem distillation yields a sweet odoured oil having no colour-4.3%, the residue gavelupiol <sup>[24]</sup> .

8	Pharmaceutical chemistry (as a whole plant)	The presence of triterpenoids, flavonoids, saponin <sup>[25, 26]</sup> , Macrocyclic alkaloids, <sup>[27, 28]</sup> and Phenolic glycosides <sup>[29]</sup> .
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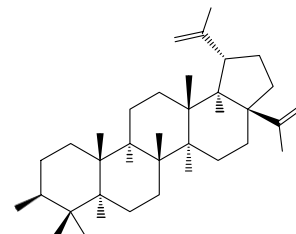
### Structure of chemical constituents'- [1]



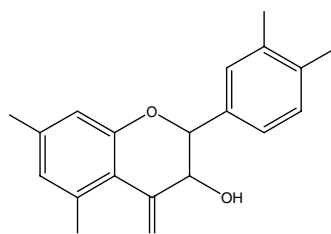
Melacacidin



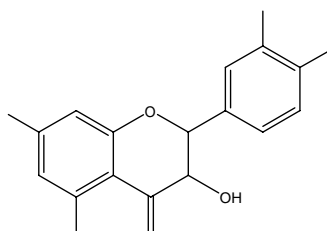
β-sitosterol



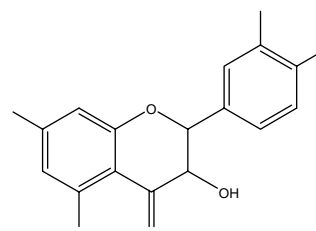
Betulinic acid



Kaempferol

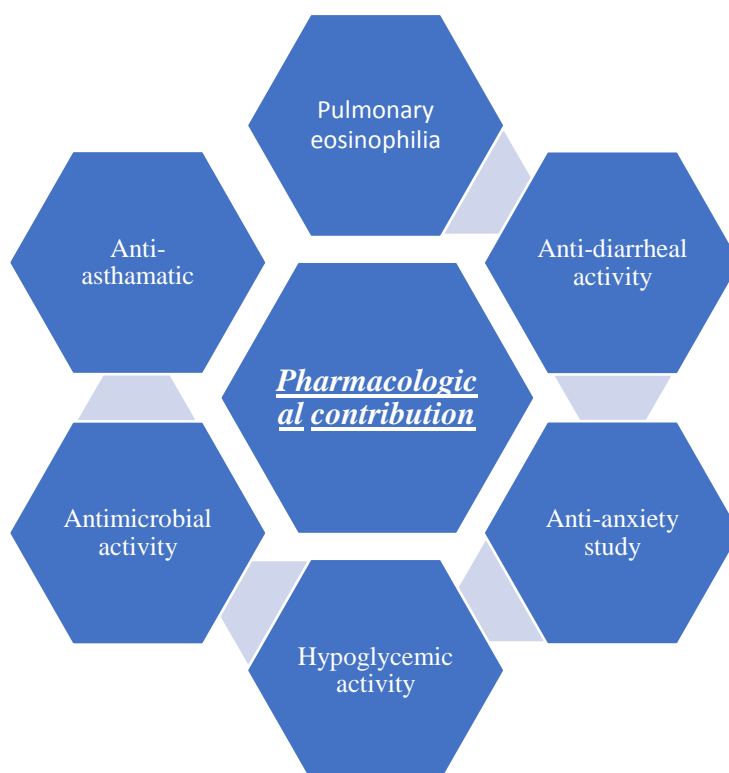


Quercetin



Lupeol

### Pharmacological contribution-



- **Pulmonary eosinophilia:** Preliminary screening in 35 tropical pulmonary eosinophilia cases treated with extracts of *Shirishapushpa* 200 mg dose with water twice a day indicated 82%, 12%, 6% marked response, good response and poor response respectively. Zero (AE) Adverse Effects were reported in the study. [61]
- **Anti-diarrheal activity:** AL possesses anti-bacterial activity against infectious diarrheal. Aqueous, methanol & chloroform extracts of AL exhibited activity against *E. coli* & *Salmonella* species. Petroleum ether & hexane extracts did not exhibit any activity. None of the extracts showed activity against *Shigella* & *Candida* sp [33]. It has also been shown that AL has moderate activity against *V. cholera*, *A. hydrophilis* and *B. subtilis*
- **Anti-anxiety Study:** Saponin extracted from dried leaves contains n-butanol fraction which is potent enough to inhibit baclofen-induced hypothermia and passivity in amnesic mice. The studies concluded that anxiolytic activity and nootropic activity was possessed by n-butanol fraction [62]
- **Hypoglycemic activity:** Ethanol extract of *Shirishadi* polyherbal compound demonstrates good  $\alpha$ -glycosidase and  $\alpha$ -amylase inhibitory activity. Extract of *Shirish* compound in ethanol exhibits 76.40% + 0.88% decrease in  $\alpha$  amylase activity and 63.85% + 0.36% in  $\alpha$  glycosidase activity with IC<sub>50</sub> 0.68 mg/ml and 2.89 mg/ml, consecutively. *Shirishadi* extracts have the dual advantage of having  $\alpha$ -glycosidase and pancreatic  $\alpha$ -amylase inhibitor action; hence, it may prove to be the best drug for the management of bronchial asthma associated with diabetes mellitus. This study suggests that the ethanol extract of *Shirishadi* polyherbal compound effectively corresponds as  $\alpha$  amylase and glycosidase inhibitor. It also leads to a decrease in starch hydrolysis and thus acts as hypoglycaemic as well as anti-asthmatic drug. [62]
- **Antimicrobial activity:** The total glycosides, cardenolide glycosides, anthraquinone glycosides isolated from the stem bark revealed antimicrobial activity against the test cultures of *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Candida albicans*, *Trichophyton rubrum*, *T. tonsures*, *T. violaceum*, *T. mentagrophytes*. The mechanism of action of the active principles was studied. The glycosides caused leakage of cytoplasmic constituents. The extract of the root showed antifungal activity against the plant fungi *Helminthosporium sativum*. The alcoholic extract of the bark revealed moderate anthelmintic activity against *in vitro* human *ascaris lumbricoides*. [63]
- **Anti-asthmatic activity:** A significant decrease in WBC, eosinophil count, ESR, and 56% marked improvement is reported in the clinical studies of stem bark decoction. *Shirishadi* used for one month in the dose of 40 ml per day in cases of bronchial asthma provided percentage of 36.59%, 43.90%, 7.32% mild, moderate and marked improvement. *Shirishadi Ghana Vati* at a dose of 1000 mg four times a day with water for 30 days provided marked improvement in 40% patients are improved markedly, mild improvement in 20% patients. Decoction of the inflorescence significantly protected the guinea pig from bronchospasm induced by histamine. The activity could be due to smooth muscle relaxation. Aqueous extract of *Albizia lebeck* Benth. may prove protective in bronchial asthma as it has been proven to decrease histamine-induced bronchospasm in guinea pigs. [32]

### Conclusion-

In last two to three decades, it has been observed that number of phytochemicals, pharmacological study is being performed to find out the different therapeutic properties of a herbal medicine. All the therapeutic properties mentioned in Ayurvedic and other classical medicines are being tested and if they are found correct, they are accepted otherwise discarded. Antidotal value of shirish is not found correct. Beside this, there are other therapeutic properties present in AL like anti-anaphylactic, anti-asthmatic, anti-diarrheal, anti-spermatogenic, anxiolytic activity etc. However, most of the therapeutic properties are proved in animal experiment model, therefore it is very necessary to conduct controlled clinical studies so that more clinical data in support of effectiveness of medicine can be collected. *Albizia lebeck* is also rich in chemical constituents which have therapeutic and medicinal value like D- catechin, Melacacidin, leucoanthracyanidin, lebeck acid,  $\beta$ -sitosterol, betulinic acid, caffeic acid, kaempferol, quercetin, lupeol and *Albizia* hexoside A (1) & A (2). A single drug is useful in various different diseased conditions with evidences are presented here. It is proved that *Shirish* is a multipotent drug and can be promoted as a future drug. Its utility can be explored in the field of environmental poisoning.

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