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A critical review on antitoxic formulations of *Shirisha* (*Albizia lebbbeck* L.) WSRT major classics of Ayurveda

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Abstract

Ayurveda is a part of science of wholesome living. Majority of medicine mentioned in *Ayurveda* are plant based. *Agadatantra* (Toxicology) is specialized branch of *Ayurveda* that highlights the different mode of poisoning & its management. While treating different cases of poisoning different modality of treatment are used. *Agada* (Antidote) is one of the modalities which is prepared by the combination of different anti-poisonous herbs. *Shirisha* (*Albizia Lebbeck*) is one of the important herbs having a broad spectrum of therapeutic effect. In classical textbook it is mentioned as the best among the *Vishaghna* drugs. Many formulations of *Shirisha* in different modes of administration have been mentioned in the management of various poisons in *Bruhatrayee* (Major treatises of *Ayurveda*). *Shirisha yogas* are mentioned for both internal administration and also for external applications as *Lepa*, etc. This review is an attempt to explore the number of *yogas* mentioned in *Visha chikitsa* which contains *Shirisha* as the main ingredient. So present review is aimed to compile up the updated data and highlight the *Vishghna* property on its pharmacological activity. Scientific researches proved its anti-histaminic, anti-allergic, Antiulcer, hepatoprotective, anti-bacterial activity. On this basis it is concluded that our '*Acharyas*' perception about *Shirisha* as an anti-poisonous is factual and may be based on their experimental studies at that time.

Keywords: shirisha, visha, yogas (formulations), *agada* (Anti Poisonous preparations), *bruhatrayees*

Introduction

Drugs derived from plants constitutes the major portion of *Ayurvedic* pharmacopoeia and majority of them are identified, classified and described with their respective therapeutic properties during the *Samhita* and *Nighantu* periods. In *Ayurveda*, groups of drugs have been classified in to various *Ganas* based on pharmacological properties, morphological characters etc. which play key role in proper identification of plants ^[1].

Acharya Charakaa also quotes about the importance of knowledge of drugs as "*AushadhamVisham*" (C. 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.

Properties

Rasa Pancaka ^[2]

| | | |
|------------------|---|--|
| <i>Rasa</i> | : | <i>Madhura, Tikta, Kasaya,</i> |
| <i>Guna</i> | : | <i>Grahi;</i> |
| <i>Veerya</i> | : | <i>Anushna</i> |
| <i>Vipaka</i> | : | <i>Katu</i> |
| <i>Bija</i> | : | <i>Shukra Stambhaka</i> |
| <i>Doshaghna</i> | : | <i>Tridosha</i> |
| <i>Rogaghna</i> | : | <i>Twakroga, Shwasa, Shotha, Agrya</i> (foremost) <i>Aushadha</i> for <i>Visha</i> |

Official parts: Stem-bark, flowers, seeds and *Panchanga* (whole plant).

Many drugs and formulations have been described as *Vishaghna* (anti-poisonous) among which one of the most important and commonly used drugs is *Shirisha* and it is said to be best among all the *Vishaghna* (anti-poisonous) drugs ^[3].

Botanically it is termed as *Albizia lebbbeck* (L.) Benth belonging to the family *Fabaceae*; is a medicinal plant associated with diverse biological activities like antimicrobial,

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analgesic, anti-inflammatory, antidiarrheal, immune modulatory, anti-arthritis, anti-asthmatic, anticonvulsant, etc. stated by various researchers [4].

Albizia lebbbeck [5-10] (L.) *Shireesh* is *Tikta*, *Madhur*, *Kashay* in *Rasa*. *Ushana Veerya*, *Katu Vipak*, *Gunas are Laghu*, *Ruksha*, *Tikshana*. *Karma* (mode of action) is *Vedanasthapan* (Analgesic) *Shothahar* (Anti-inflammatory) *Vishaghana* (antipoisonous) [11-14]. *Form of application-Pana*, *Dhuma*, *Lepa*.

Special treatment modalities have been described which work based on their *Prabhava* (specific action). There are some drugs which are considered to be *Vishaghna* (anti-poisonous) in nature. There are different varieties of *Shirisha* (*Albizia lebbbeck*) explained in different *Samhitas*. *Acharya Bhavaprakasha* has mentioned two types of *Shirisha* (*Albizia*

lebbbeck) namely *Shweta* (white) and *Krishna* (black). *Krishna* (*Albizia lebbbeck*) variety is easily found but *Shweta Shirisha* (*Albizia procera*) is very rare [15].

Traditionally, the barks are used in toothache and diseases of the gum. Decoction of the leaves and barks are protective against bronchial asthma and other allergic disorders. Barks and seeds are astringent and are given in piles and diarrhea [16].

A Research article has mentioned that ethanolic and methanolic extracts of pods possess anti-protozoal, anti-fertility activity, hypoglycemic and anticancer properties. The plant extract has also been reported to have antiseptic, anti-dysenteric, ant-ovulatory, anti-inflammatory, antimicrobial and anti-tubercular activities [17].

Table 1: Yoga containing Shirisha in Charaka Samhita

| S. No | Yoga | Indications | Mode of administration | Part used |
|-------|--|---|---|--|
| 1. | <i>Kakandaadi yoga</i> [18]. | In conditions where the strangulated or drowned victim or in poisoned person can be revived | <i>Lepa</i> (ointments) <i>Nasya</i> (Nasal inhalation) <i>Paana</i> (Internal medication) | <i>Phala</i> (fruit) |
| 2. | <i>Mritasanjivini agada</i> [19]. | <i>Sarva visha nashaka</i> (all types of poisons), <i>Jwara</i> (fever) | <i>Ghreyra</i> (Inhalation through nose) <i>Vilepana</i> (ointments) <i>Dharana</i> (as an amulet) <i>Dhoopana</i> (fumigation) <i>Grihastasya</i> (kept at home) | <i>Pushpa</i> (flower) |
| 3 | <i>Panchama vega</i> [20]. | <i>Sthavara visha</i> (vegetative poison) | <i>Ashchotana Anjana</i> (Collyrium) <i>Nasya</i> (Nasal inhalation) | <i>Patra</i> (leaves) |
| 4 | <i>Ashtama vega</i> [21]. | <i>Sthavara visha</i> (plant poison) | <i>Paana</i> (Internal medication) | <i>Pushpa</i> (flowers) <i>Swarasa</i> |
| 5 | <i>Gandhahasti agada</i> [22]. | <i>Sarva visha nashaka</i> | <i>Paana</i> (Internal medication) <i>Anjana</i> (collyrium) <i>Lepa</i> (ointment) | <i>Pushpa</i> (flowers) |
| 6. | <i>Mahagandhahas ti agada</i> [23]. | <i>Mushika</i> (rat bite) <i>Luta</i> (spider bite) <i>Sarpa</i> (all types of snake bites) <i>Mula</i> and <i>Kanda visha</i> (roots and rhizomes poisoning) | <i>Paana</i> (Internal medication) <i>Anjana</i> (collyrium) <i>Lepa</i> (ointment) | <i>Panchanga</i> (five parts of the plants) |
| 7. | <i>Dhoomagada yoga</i> [24]. | <i>Keeta</i> (insect bites) highly significant in the cases of <i>mashakadamsha</i> as <i>dhoom</i> to fumigate the home. | <i>Doopana yoga</i> (fumigation) | <i>Pushpa</i> (flowers) |
| 8 | <i>Sarpa dashta</i> [25]. | <i>Jangama visha</i> (animal poison) | <i>Paana</i> (Internal medication) <i>Nasya</i> (Nasal inhalation) <i>Anjana</i> (collyrium) | <i>Pushpa</i> (flowers) |
| 9 | <i>Sarvakarmika agada</i> [26]. | <i>Luta visha</i> (spider bites) | <i>Paana</i> (Internal medication) <i>Nasya</i> (Nasal inhalation) <i>Anjana</i> (collyrium) <i>Lepa</i> (ointment) | <i>Beeja</i> (seed) |
| 10 | <i>Madhukadi yoga</i> [27]. | <i>Luta visha</i> (spider bites) | <i>Paana</i> (Internal medication) | <i>Twak</i> (bark) |
| 11 | <i>Vrana nashaka yoga</i> [28]. | <i>Keeta</i> (insect bite) <i>Luta</i> (spider bite), can be helpful in post bite management of snake bites, for wound healings due to poisoned weapons, arrows. (Many poisons are used as arrow poisons) | <i>Lepa</i> (ointment) | <i>Twak</i> (bark) |
| 12 | <i>Vrishchika Visha nashaka yoga</i> [29]. | <i>Vrishchika visha</i> (scorpion bite) | <i>Lepa</i> (ointment) | <i>Pushpa</i> (flowers) |
| 14 | <i>Parama Agada</i> [30]. | <i>Sthavara</i> (vegetative poison) <i>Jangama</i> (animal poison) | <i>Paana</i> (Internal medication) <i>Nasya</i> (Nasal inhalation) <i>Anjana</i> (collyrium) | <i>Twak</i> (bark) |
| 15 | <i>Amrita ghrita</i> [31]. | <i>Sthavara</i> (vegetative poison) <i>Jangama</i> (animal poison) | <i>Paana</i> (Internal medication) <i>Nasya</i> (Nasal therapy) | <i>Twak</i> (bark) |
| 16 | <i>Pancha shirisha Agada</i> [32]. | <i>Jangama</i> (animal poison) <i>Sthavara</i> (vegetative poison) | <i>Paana</i> (Internal medication) | <i>Panchanga</i> (five parts of the plants- flowers, fruits, leaves, bark, root) |

Table 2: Yoga containing *Shirisha* in *Sushruta Samhita*

| S. No | Name of the yoga | Indications | Mode of administration | Part used |
|-------|----------------------------------|--|--|-------------------------|
| 1 | <i>Koshatakyadi yavagu</i> [33]. | <i>Visha vegantara</i> | <i>Paana</i> (internal medication) | <i>Twak</i> (bark) |
| 2 | <i>Vamshatwagadi Agada</i> [34]. | <i>Luta</i> (spider bite) <i>Undura</i> <i>Pannaga</i> (variety of snake) | <i>Lepa</i> (ointment) <i>Anjana</i> (collyrium) <i>Nasya</i> (nasal inhalation) <i>Varti</i> (suppository) | <i>Pushpa</i> (flowers) |
| 3 | <i>Ekasara yoga</i> [35]. | <i>Sarpa visha</i> (snake bite) | <i>Paana</i> (internal medication) | <i>Pushpa</i> (flowers) |
| 4 | <i>Mahasugandi agada</i> [36]. | <i>Sarva visha nashaka</i> (all types poison) Also used for induction of abortion. | <i>Lepa</i> (ointment) <i>Dharana</i> (wearing) | <i>Pushpa</i> (flowers) |
| 5 | <i>Ksharagada</i> [37]. | <i>Jangama</i> (animal poison) <i>Sthavara</i> (vegetative poison) <i>Sarva visha nashaka</i> (all types poison) | <i>Paana</i> (internal medication) <i>Nasya</i> (nasal inhalation) <i>Abhyanga</i> (massage) <i>Lepa</i> (ointment) | <i>Twak</i> (bark) |
| 6 | <i>Amrita sarpi</i> [38]. | <i>Sarva visha nashaka</i> (all types poison) | <i>Paana</i> (internal medication) | <i>Beeja</i> (seed) |

Other uses of *Shirisha* as a single drug: *Shirisha Beeja* is used in *Dantha kashta* (tooth brush twigs), In *Visha Chikitsa* as *Prathisarana* [39].

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* [40].

Similarly, *Phala* is used for *Vamana* (emesis) and *Sara* (heart

wood) is used for *Shirovirechana* (*Nasya*) [41].

In *Keeta visha chikitsa* (*Insect poisoning*), *Shirisha Twak* (bark) is used for *Paana* (internal medication) and *Lepa chikitsa* (ointments), *Alepa* (external application) and *Seka* [42]. In *Pitta Pradhana Luta Damsha* (spider bites), *Shirisha Twak* (bark) is used for both *Paana* (internal medication) and *Lepa* (ointment) [43].

Table 3: Yoga containing *Shirisha* in *Ashtanga Hrudaya*

| S. No | Name of the yoga | Indications | Mode of administration | Part used |
|-------|------------------------------------|---|------------------------------------|---------------------|
| 1 | <i>Koshatakyadi agada</i> 32 [44]. | <i>Vishavegantara</i> (between stages of poisoning) | <i>Paana</i> (internal medication) | <i>Twak</i> (bark) |
| 2 | <i>Ashtanga agada</i> [45]. | <i>Gonasaja Sarpa</i> (a variety of snake) | <i>Paana</i> (internal medication) | <i>Beeja</i> (seed) |

As *Prathisarana* (rubbing), *Shirisha Twak* is used in *Vishadagdha Vrana* (wound caused by poisoned arrows or Weapons) [46].

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) [47].

In case of *Vrishchika* (scorpion bites) *Chikitsa Shirisha Phala* (seed), *Pushpa* (flowers) and *Beeja* (seeds) are used in different forms like *Paana* (internal medication), *Anjana* (collyrium) and *Lepa* (ointment) [48].

Especially in *Ratri* (night), *Vrishchika* (scorpion bites) *chikitsa- Pushpa* (flowers) and *Beeja* (seeds) are considered to be best [49].

In *Luta* (spider bite) *Chikitsa*, *Shirisha Twak* and *Phala* is used for *Lepa* and *Paana*. *Shirisha Sara* and *Phala* (fruits) are used for *Shirovirechana* (*Nasya*) in *Bhujanga* (snake bites),

Luta (spider bite) and *Undhura* (mice) [49].

In *Mushika* (rat bites) *Damsha Shirisha Beeja* (seed) is considered to be the best [50].

Discussion

The total *Agada yogas* explained in *Samhitas* with respect to *Shirisha* in *Visha Chikitsa* are twenty-five and in some context, they have not named the *Yoga* (multidrug formulations) but explained as *Vishahara Aushadhi* for the management of both *Sthavara* (vegetative poison) as well as *Jangama* (animal poison) *Visha*. *Paana* (internal medication) *Yogas* are highest in number as they are more effective in the *Visha chikitsa*. The antitoxic effect of *Shirisha* may be more than other routes of administration. These are all among the *Chaturmishathi upakarma* [51].

Table 4: Out of total twenty-five antitoxic formulations of *Shirish*, classification according to their mode of administration"

| S. No. | Mode of administration | Number of formulations used |
|--------|--|-----------------------------|
| 1 | <i>Paana yogas</i> (internal medication) | Seventeen |
| 2 | <i>Lepas</i> (ointment), | Nine |
| 3 | <i>Nasya yogas</i> (nasal therapy) | Eight |
| 4 | <i>Anjana yogas</i> (collyrium), | Seven |
| 5 | <i>Dhoopana yoga</i> (fumigation), | Three |
| 6 | <i>Ashchotana yogas</i> | Two |
| 7 | <i>Dharana yogas</i> (used as amulets) | Two |

Twenty four treatment procedure mentioned in the management of poison, which plays a major role in counteracting the *Visha* and stops the *Visha* from spreading all over the body. It is mentioned in the name of *Aushadhi* which includes *Agada yogas*. *Panchangas* of *Shirisha* are used as *Paana* (internal medication) in many formulations with different *Anupanas* (adjuvants) like *Ghrita* (ghee) and *Madhu* (honey) [52].

Lepa (Ointment) *yogas* are not only the *Bahirparimarjana Chikitsa* but also acts on local poisoning in the cases of bites. It is one among the *Chaturmishathi upakarmas* (24 treatment procedure). In *Visha Damsha* conditions, *Sthanika chikitsa* (local external treatment) plays an important role to reduce the pain, itching and inflammation at the site [53]. *Shirisha* is best *Vedanasthapaka* (analgesic), *Shothaghna* (antiinflammatory), *Vrana Ropaka*, *Vishaghna* (anti-

poisoning) and *Tridosha shamaka* ^[54].

It helps in pacifying the *Bhrajaka Pitta* situated in the *Twacha* thus directly removes the *Visha* and stops spreading of *Visha* into the *Rakta*. All parts of the plant are used but mainly *Twak* ^[55].

Nasya (nasal inhalation) is one of the eliminating therapy which helps to remove the vitiated *Doshas*, toxins and poison from the nasal route. It is indicated in *Sthavara Visha* (5th Vega), *Darveekar A Sarpadamsha* (3rd and 7th Vega), *Rajimanta Sarpadamsha* (6th Vega), when the effect of poison is seen in the head; if obstruction occurs at nose, eye, ear, tongue and throat due to poisoning and if person is unconscious. In Luta poisoning, *Nasya* by *Shyama*, *Yavaphal*, *Faninjaka*, *Shirisha* are mentioned. These are grinded with *Vartaka* juice or with *Sarpimanda*. In *Mushika* (rat poisoning) *Visha*, *Nasya* (nasal inhalation) is done with *Shirisha Phala Sara*. *Shirisha* is one among the *Shirovirechaniya Gana Dravyas* (*Nasya*) mentioned in the *Charaka Samhita* ^[56].

Amritaghrita, *Tanduliya Agad*, *Ashtang Agad*, *Sarvakarmik Agad* are some common preparation of *Shirish* which was used in different type of poisoning. While studying the properties of *Shirish* it was seen that it is *Tridoshshamak* & it possess qualities like *Shothahara* (Antiinflammatory), *Vedanasthapa* (analgesic), *Varnya* (complexion enhancer), *Vishaghna* (Antipoisonous), *Shirovirechana*, *Raktashodhaka* (blood purifier). Pharmacodynamics of *Shirish* shows that it possesses *Kashay*, *Tikta Rasa*. *Tikta Rasa* itself is antitoxic in nature & *Kashay Rasa* help in the healing procedure in bite cases. In the cases of poisoning specially in insect bite, snake bite, rat bite symptoms are pain, inflammation & oedema. Phytochemical screening of successive extracts of *Albizzia lebbbeck* leaves shows presence of carbohydrates, alkaloids, tannin, flavonoids and saponins. Main attraction of phytochemical screening is presence of tannins, saponin and flavonoids where absence of proteins and amino acids.

After several experimental model & clinical trial multi-dimensional activity of *Shirisha* like analgesic, anti-inflammatory, anti-allergic, anti-bacterial, antifungal, anti-protozoal, anticonvulsant, anti-anaphylactic, antioxidative is proved.

Spider Poisoning: Application of the paste of *Shirisa*, *Katabhi* (*Careya arborea*), *Arjun* (*Terminaliya Arjuna*), *Shlesmantak* (*Cordiya diachotoma*).

Rat bite: Paste of *Shirisa* and *Inguda* (*Balanites Aegyptiaca*) should be taken with honey. In the management of rat bite application of paste of *Shirisha*, *Rajani* (*Rubiocordifoliya*), *Vakra* (*Pisticaintegrammiya*), *Kumkum* (*crocus sativus*), *Amrutavalli* (*Tinospora cordifoliya*).

Scorpion bite: Flowers of *Shirisha*, *Karanja* (*Pongamia pinnata*), *Kushtha* (*Saussurea lappa*), *Manshila* (*As₂S₂*), *Kashmira* (*Gmelina arborea*) destroy the scorpion poison.

Some examples of different Formulations & *Agadas* of *Shirisha* for Internal/ External Use are as follows,

1. *Shirisharishta-Shirish*, *Priyangu* (*Callicarpa macrophylla*), *Kushtha*, *Ela* (*Nagkesha* (*Mesua ferrea*), *Haridra* (*Curcuma longa*), *Daruharidra* (*Berberis Asiatica*), *Sunthi*. It is useful in all cases of poisoning ^[57].
2. *Shirishabejadi lepa* - *Ark*, *Shirish*, *Pimpali*. It is effective in Insect, snake, spider, Scorpion Bite ^[58].
3. *Shirishadya anjana* - *Shirish*, *Pimpali*, *Marich*, *Saindhav lavan*, *Laahsun* (*Allium stiva*), *Manshil*, *Vacha*. It is used in unconscious patient ^[59].
4. *Kandarpasara taila* - *Giloy*, *Nimb*, *Haridra*, *Shirish*, *Ark*, *Dhat ura*, *Snuhi*, *Kumari*, *Bramhi*, *Patol*, *Pimp ali*,

Chira-yata. All types of *Kushtha* (skin diseases) can be cured by its use ^[60].

5. *Dashanga lepa Shirish*, *Mulethi*, *Tagar*, *Lalchandan*, *Chhoti ilayachi* *Jatamansi*, *Haridra*, *Daruhardra*, *Kushtha*, *Netrabala*. It is indicated in *Visarpa*, *kushtha*, *Jwar*, *Shotha* ^[61].
6. *Panchashirisa Agada* - *Shirish Panchang*, *Trikatu*, applied in Insect bite ^[62].
7. *Amrut Ghrut* - *Apamarg*, *shirish*, *Shweta*, *Mahshweta*, *Kakmachi*, Cow's urine, useful in Comatose patient 17 ^[63].
8. *Tanduliyak Agad-Tanduliyak*, *Kashmarya*, *Kinihi*, *Girakar nika*, *Matulungi*, *Sita*, *Shelu*. it is used in Rajiman snake bite ^[64].
9. *Ashtang Agada- Vansh*, *Katuka*, *Patali*, *Nagar*, *Shirishbeej*, *Govedhuk*, *Vacha*, used in Ghonus Bite19 ^[65].
10. *Sarvkarmik Agad* - *Vansh*, *Amalki*, *Kapiththa*, *Trikatu*, *Haimvati*, *Kushtha*, *Karanjabeej*, *Tagar*, *Shirisha*, Cow's bile. It is indicated in Spider Bite ^[66].
11. *Rishabh Agad-Twak*, *Ela*, *Jatamansi*, *Kinihi*, *Patol*, *Patha*, *Padmak*, *Ashok*, *Bharangi*, *Vidang*, *Chandan*, *Yashtimadhu*. Useful in Snake poison, insect poison ^[67].
12. Insect Bite: *Shirisha* seeds mixed with *Pippali* (*Piper longum*) powder are impregnated thrice with *Arka* latex. This formulation destroys poisons of insects.
13. *Vishaghna lepa* C.su.3/ 30th *Shirisha* and *Sindhuvaar lepa* for external use in the snake poisoning cases.
14. *Vishagna Mahakashaaya* c.su.4/16th *Mahakashaya* for internal use in the form of decoction, *Shirish*, *Sindhuwar* etc.

Many more are the examples to explain the use of *Shirisha* therapeutically as antitoxic. Apart from *Raspanchaka*, Toxic and antitoxic drugs act on the basis of their *Prabhav*, which is the known special potency and power the drug. Effect of *Prabhava*, only be guessed but not logically justified. But there huge results keep the experts mum about the efficiency of drug on a particular system or poison. It is just like that plants possesses poison to protect themselves from the enemies. But the same poison can be utilized by the physician to heal the patients provided physician should be knowledgeable and well equipped enough to handle the emergency if happened any.

Conclusion

As *Shirish* contain many alkaloids, flavonoids, tannin, saponin & many of its action proved on scientific basis it can concluded that it is a very promising plant in various activities, therefore ancient *Aacharyas* have mentioned it as *Vishaghna* plant.

Acharya Charaka quoted *Shirisha* as a best anti poisonous drug and also mentioned in *Vishaghana Gana Dravyas* (anti-poisonous drugs). Many studies conducted by different branches by using different parts of the plant have proved antimicrobial, analgesic, anti-inflammatory, anti-diarrhoeal, immuno- 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 *Yoga* have been mentioned for internal and external use containing *Shirisha* as an ingredient. All the *Yoga* are not in practice and hence there remains scope for further research on these *Yoga*.

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