



Review Article

REVIEW ON *ARGYREIA SPECIOSA* (L.F.) SWEET. (*VRDDHADARU*): PLANT OF INDIAN MEDICAL LEXICONS

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ABSTRACT

Argyreia speciosa Sweet. is a popular Indian medicinal plant, which has long been used in traditional Ayurvedic Indian medicine for various diseases. It is commonly known as *Vidhaara* or *Vrddhadaru*. It is a large creeper and is covered with hair all over. Flowers are either pink or red or purple coloured. It is not mentioned in Samhitas, but described in the Nighantu granthas. *Vrddhadaru* is a controversial drug. It is mainly confused with *Ipomoea petaloidea*. In Nighantus it is described by name of *Vrddhadaru*. It is mainly described in Dhanvantri Nighnatu, Shodhal Nighantu, Abhidhan Ratnamala, Madanpal Nighantu, Raj Nighantu, Nighantu Adarsh and in Priya Nighantu. The Importance of Plant is well recognized by its presence in almost all Nighantus and by its therapeutic potential. Therapeutically prove action of *Argyreia speciosa* Sweet. Is in aphrodisiac, immunomodulatory, hepatoprotective, antioxidant, antiinflammatory, antihyperglycemic, antidiarrheal, antimicrobial, antiviral, antiulcer, anticonvulsant, analgesic and central nervous depressant activities. A wide range of phytochemical constituents have been isolated from this plant. Its seeds mainly contain ergine, isoergine which has hallucinogenic properties. It is a comprehensive account of the Taxonomy, Synonyms, Vernacular names, Classical review, Properties, Controversy, Morphology, Microscopy of root, stem & leaf, Chemical constituents & their action, Indication, Part used, Dosage, Therapeutic usage, Formulations & Preparations and recent research findings which shows the importance of plant and help to gain knowledge about the plant.

KEYWORDS: Nighantu, Aphrodisiac, immunomodulatory, phytochemical constituents.

INTRODUCTION

The term herb refers to a plant used for medicinal purpose. Medicinal herbs and plant extracts are now generally considered as effective medicines to be respected, appreciated and they play a major role. World Health Organization estimated that about 80% of the world's population relies on herbs for their primary healthcare needs.¹ One such plant, *Argyreia speciosa* Sweet., is a perennial climbing vine native to the Indian subcontinent and introduced to numerous areas worldwide.² It is often prized for its aesthetic value.³ *A. speciosa* seeds contain various ergoline alkaloids such as ergine.⁴ A study reported stereoisomers of ergine to be found in the seeds at a concentration of 0.325% of dry weight.⁵ *A. speciosa* was not traditionally used for its hallucinogenic properties. Its properties were first brought to attention in the 1960. The seeds contain the highest concentration of psychoactive compounds in the entire family. Extracting ergine from *A. speciosa* seeds is illegal in the USA, since it is classified as a schedule-3 depressant by the DEA. It is now illegal to supply *A. speciosa* in the United kingdom due to the passing of the psychoactive substances Act 2016⁶. It has various medicinal properties is widely used in *Ayurveda*. In this review a comprehensive account of the Classical review from different lexicons and other ayurvedic texts, morphology, phytochemical constituents and pharmacological activities, different research activities are included in a view.

Taxonomy of *Argyreia speciosa* Sweet^{7,8}

Table 1: Showing Botanical Classification of *Argyreia speciosa*

Kingdom	:	<i>Plantae</i>
Subkingdom	:	<i>Tracheobionta</i>
Super-division	:	<i>Spermatophyta</i>
Division	:	<i>Magnoliophyta</i>
Class	:	<i>Magnoliopsida</i>
Subclass	:	<i>Asteridae</i>
Order	:	<i>Solanales</i>
Family	:	<i>Convolvulaceae</i>
Genus	:	<i>Argyreia</i> Lour
Species	:	<i>A. speciosa</i>

Binomial name: *Argyreia speciosa* (L.f.) Sweet.

Synonyms: *Argyreia nervosa* (Burm. f.) Bojer

Convolvulus nervosus Burm.f.

Convolvulus speciosus L.f.

Santaloides minus

Lettsomia nervosa (Burm.f.) Roxb

Synonyms⁹⁻¹⁵

- *Vridhhadaru*
- *Ajandi*

- *Kakshagandha*
- *Antahkotarpushpi*
- *Chagantri*
- *Vrsyagandhika*
- *Avegi*
- *Jogank*
- *Jeernabalak*
- *Shyama*
- *Mahishvallari*
- *Ajantri*
- *Mahashyama*
- *Vallari*
- *Drighaballak*
- *Vridha*
- *Jeernavalkal*
- *Chhaglani*
- *Chhagali*

Vernacular names¹⁶⁻¹⁹

Table 2: Showing vernacular names of Vidhaara

Sanskrit	<i>Chhagalantri</i>
Hindi	Bidhara, Ghavpatta
English	Elephant Creeper
Telugu	Samudrapala
Gujrati	Undha Chhati num pana
Tamil	Samudrapachhe
Malyalam	Samudrasoak
Bengali	Vijratadak, Vindhatadak

Classical Review: *Vrddhadaru* is not described by the Brhat Trayi but mentioned as *Trikona Kanda* in *Astang Sangraha*²⁰. Acharya Caraka quoted '*Vrddha ruha*' in the context of *Sukrajanana dasaimani* but, Acharya Cakrapani confirmed it as *Satavari*²¹. It is described in lexicons.

- *Dhanvantri Nighantu* has described *Vrddhadaru* in *Karveeradi varga*²².
- In *Shodhal nighantu Vrddhadaru* is in *Karveeradi Varga*²³.
- In *Abhidhaan Ratnamala* or *Shadrassa Nighantu Vrddhadaru* is mentioned in forth *Varga* i.e., *Tikta sakandha*²⁴.
- *Madanpal Nighantu* has described *Vrddhadaru* in *Abhyadi varga*²⁵.
- In *Kaidev Nighantu* it is mentioned in *Aoushdhi Varga*²⁶.
- In *Bhavprakash Nighantu Vrddhadaru* is described in *Guduchyadi Varga*²⁷.
- *Raj Nighantu* included *Vrddhadaru* in *Guduchyadi Varga*²⁸.
- *Nighantu Adarsh* Described it in its second volume in *Vrddhadarvyadi Varga*²⁹.
- *Vrddhadaru* is in *Sharadi Varga* of *Priya Nighantu*³⁰.

Properties^{31,32}

Rasa (Taste) – *Katu* (Pungent), *Tikta* (Bitter), *Kashaya* (Astringent)

Guna (Qualities) – *Laghu* (Light for digestion), *Snigdha* (Slimy)

Vipaka – *Madhura* (Undergoes sweet taste after digestion)

Veerya (Potency) – *Ushna* (Hot)

Karma (Actions) – *Kaphavata shamaka* (reduces vitiated *Kapha* and *Vata dosha*).

Vrddhadaru A Controversial Drug³³

It was identified before as *Argyreia speciosa* but looking to the description as given by the commentator of *Sidhhamantra* in *Astang Samgraha* that :

- Stem should be triangular.
- Flowers should be red or crimson.
- Fruits yellow.
- It must be a gigantic creeper.
- Leaves should be of the shape of betel leaves with milky juice.
- The whole plant should be pubescent.

All this corresponds with *Ipomaea petaloidea* Choisy; *A. speciosa* has not triangular stems and red flowers etc. Roots, leaves, seeds are used in medicine.

In Kanpur the roots of *A. speciosa* are sold as black *Trivrt* (*Operculina turpethum*).

The seeds of *Thespesia populnea* (Malvaceae) *Parasapipala* are sold as the seeds of *Vrddhadaru* which are considered aphrodisiac.

Adhoguda (*Charaka, Sutra*) has been identified by *Cakrapani* as *Vrddhadaru*, but *Guda* means *Snuhi* = *Euphorbia nerifolia* (Euphorbiaceae). *Adhoguda* is a purgative and it is in the list of *mulini* i.e. whose roots are to be used as purgative. So *Adhoguda* is not *Vrddhadaru*. *Antahcotarpushpi* is the correct identification of the flowers of convolvulaceae. They are really so i.e. corolla campanulate, purplish white with deep rose coloured. The leaves of *Ipomaea petaloidea* are cordate, acute, glabrous, above, thickly nerved beneath and silky silvery. The word *Argyreia* means white or silver like. The upper side of the leaf is used to act as a discutient, the under or white side is maturant. The leaves are very useful to disperse the swellings due to boils. They are also employed in diabetic carbuncle. It prevents old age or kills the old or advancing age i.e. it makes old men even fit for taking a wife. It means that it is a good aphrodisiac. It is also a good alternative or rejuvenating.

In medicine roots should be used. In Gujarat, *Samudrasosha* is *Argeria speciosa* or *Petaloidea*. But in Hindi, *Salvia piebeia* (Labiatae) is taken as *Samudrasosha*.

Morphology³⁴

Root

The roots of *Argyreia speciosa* are varying in size as well as in thickness. The thin roots are usually 2-4 mm in diameter and show somewhat smooth brownish exterior. When cut transversely they show a thin periderm and cambium, appearing as a dark line almost midway between the centre and the outer circumference

separating the outer phloem from the inner central wood. The thicker roots are 5-25 mm in diameter or even more have a rough exterior due to the presence of large number of lenticels. A transversely cut surface of such root shows colorless tertiary phloem and a pink-colored crescent-shaped tertiary xylem.

Stem

The stem is white and tomentose in young stages. The older stem (25 mm) is so thick that it shows vertical ridges and numerous lenticels, which are mostly transversely elongated.

Leaf

The lower surface of the leaf is entirely covered with hair, which gives the leaf a silvery soft wooly appearance. The upper surface of the leaf is green, glabrous and shows the markings of nerves by slight depressions. The mature leaf is dorsiventral, unicostate with a strong midnerve and several faint lateral nerves, alternate, petiolate, acute at the apex and cordate at the base. The margin is entire but slightly wavy near the base. Lateral nerves 14-20 pairs arise alternatively on the midrib; the single nerves bifurcate before reaching the edge; the anterior branch unites with the posterior one of the neighboring nerve; an arched nervule connecting the two branches reach the margin. Petioles stout and cylindrical, a little shorter than the length of the blade are completely covered with wooly tomentum.

Seeds

The seeds are more or less triangular, 0.5 to 0.75 cm long up to 5 mm broad having two flat or slightly concave sides, the third side is convex. The hilum is distinct, brown colored, rounded situated in the spherical depression at the broader end. The outer surface is glabrous or at places with whitish patches of pulp. The texture is hard and not easily breakable. The seeds are exalbuminous. The embryo of seed is large having two-folded cotyledons and distinct plumule of whitish black to blackish brown color. The odor is not characteristic while it tastes slightly astringent.

Microscopy³⁵⁻³⁹

Root

The young root shows an epidermis composed of small cubical parenchymal cells, followed by a wide cortex consisting of mostly isodiametric or in some cases, slightly oval cells. The primary vascular structure is tetrarch to pentarch. The mature root possesses a narrow periderm of 6-8 layers of cork cells, a single layer of phellogen and 10-12 layers of phelloderm cells. The phelloderm cells close to the phellogen are somewhat tangentially elongated and thin walled but become gradually polyhedral. Some of them possess rosette crystals of calcium oxalate. The secondary phloem is a wide zone, consisting of sieve tube elements with companion cells and phloem parenchyma. Resin canals, small strands of tertiary xylem and tertiary phloem are found scattered throughout the region. The secondary xylem is composed of large xylem vessels, tracheids, fiber tracheids and fibers. The vessels are drum-shaped, having bordered pits on the walls. The tracheids are cylindrical and possess bordered pits on the walls. The wood fibers are long and tapering with pointed ends.

Stem

The young stem shows nonglandular hairs, which are uniseriate, multicellular and usually three-celled. Resin canals are distributed throughout the cortex. An amphiphloic siphonostele is present following the cortex. The mature stem shows the cork composed of 10-15 layers of cells, which are stratified due to alternate arrangement of 3-4 layers of large cells, followed by almost equal number of shorter cells. The secondary phloem is wide and occupies the greater portion. A tertiary cambium arises in the secondary phloem and gives rise to tertiary phloem and tertiary xylem strands. The xylem vessels are drum-shaped with well-marked perforation rims. A few vessels are long and cylindrical. They also have bordered pits on the walls and there are no end-wall openings. The xylem fibers are long with pointed tapering ends and short lumen. They are however, shorter and narrower as compared to the pericyclic fibres which have pointed, truncated ends and show in some cases peg-like outgrowths towards the tapering ends.

Leaf

The transverse section of the leaf near the apex shows a prominent-ridged midrib on the lower surface and a small groove on the upper surface, while a section through the basal region presents a small ridge on the upper side as well. The ventral cuticle is stratified while the dorsal is thin and simple. The epidermal cells of the upper side have synclinous walls with rubiaceous type of sunken stomata. The openings of the latex canals are bound by 5-6 cells. The epidermal cells of the underside differ from those of the upper in possessing smaller cells and about twice the number of stomata and openings of latex canals. The cells of the epidermis along the veins on both sides of the leaf are roughly rectangular, straight-walled and completely devoid of appendages. The spongy tissue is composed of rounded cells enclosing air spaces and a few latex canals. The palisade cells are nearly rectangular, roughly four times longer than broad and are seen in the section usually in a single row only and rarely in two rows. A few latex canals are sometimes present in this zone as well. The vascular bundles are hexagonal in transverse section and occur in characteristic, continuous single row chains

The transverse section of the petiole at the base is grooved along the ventral side while the groove becomes rather negligible at the apex. Arrangement of the tissues in the petiole is as in the stem. The vascular bundles are open, bi-collateral and arranged in a ring. The vasculature is represented by a shallow abaxial arc and a pair of adaxial traces. Conjunctive parenchyma separates the xylem and the phloem tissues distinctly. There are broad patches of phloem parenchyma. Xylary tissues of the leaf and the petiole are identical. Fresh vascular bundles are produced in the pith. The epidermal cells are barrel-shaped and most of them bear trichomes. Hypodermis or any mechanical tissues are completely lacking. Hexagonal cortical cells are smaller towards the periphery and the stele but are larger in the central region. The cortical cells merge gradually with the phloem parenchyma. The endodermis and pericycle are not made out even in a very young petiole. The latex canals associated with xylary

tissues are recognized. The trichomes are silvery giving a wooly cover to the dorsal surface of the leaf and the entire petiole. Each trichome has a barrel-shaped basal cells and filamentous apical cell, base of which is invariably swollen. Sometimes the basal cell may be divided into two.

The midrib is seen as a semicircular projection on the abaxial face, and on the adaxial face it is in the form of small hump. A single crescent-shaped bi-collateral vascular trace traverses in the center. The rest of the area is occupied by parenchyma. The tissue details of the vasculature and ground is similar to that of the components in the petiole. Two functional and morphological types of trichomes occur, the short glandular nine-celled peltate and the long aglandular and two-celled. The structure depicted by Singh (1957) as the pore of the latex canal are in fact the peltate glandular trichomes. The microscopic constants viz., the palisade ratio, vein islet number, stomatal number and stomatal index have also been determined.

Chemical Constituents⁴⁰

- Seed oil contain oleic acid.
- Quercetin, Kaempferol from leaves.
- Seeds contain eragine, isoeragine, penniclavine, epifriedelinol.

Action⁴¹

Root- aphrodisiac (considered as a rejuvenator), nerve (used in diseases of nervous system, sexual disorders), diuretic (used in strangury), antirheumatic. Seeds—hypotensive, spasmolytic.

Leaves- used externally in skin diseases (ringworm, eczema, boils, swellings); rubefacient, topically stimulant.

The **seeds** contain hallucinogenic ergoline alkaloids, the main ones being ergine and isoergine. EtOH(50%) extract of seeds exhibits hypotensive activity. (Seeds of all species of *Argyreia* contain ergoline alkaloids and are hypotensive.) Leaves of *Argyreia sp.* contain sitosterol and are antiphlogistic.

In Indian medicine, *A. speciosa* is not used as a single drug for sexual disorders in men, but as a supporting drug for exerting its antiphlogistic, spasmolytic and hypotensive actions on the central nervous system. The drug, in itself, did not show anabolicum-androgen-like or spermogenetic activity experimentally.

The seeds contain hallucinogens including ergonovine, isoergine (isolysergic acid amide) and ergine (lysergic acid amide). Four to eight seeds are equivalent to 10-100 mcg of LSD, a potent serotonin1A (5-HT1A) agonist. The effects last 6-8 h.

Indications⁴²

Amavata, Arsas, Sotha, Prameha, Agnimandya.

Part Used^{42,43} : Root.

Dosage^{43,44} :

Root Powder – 3-5 gm

Therapeutic Usage⁴⁵

1. **Filaria-** Powder of *Vrdhhadaru* should be taken with sour gruel.

2. **Eye diseases** – Juice of *Vrdhhadaru* mixed with honey should be used as eye drop in case of Ophthalmia neonatorum.

3. As Rasayana

- a) Powder of *Vrdhhadaru* root is impregnated with *Satavari* juice seven times and dried. This powder mixed with ghee should be used for a month. It promotes Physical and mental strength.

- b) *Vrdhhadaru* root powder should be mixed with honey and ghee for a week keeping on diet of milk and rice. It act as *Rasayana*.

4. Vatavyadhi

- a) One should take castor oil or *Vrdhhadaru* with milk.

- b) *Vrdhhadaru* taken with wine, sour gruel, cow's urine, water, fatty substances, meat- soup and vegetable soups pacify aggravated *Vata*.

5. **Urustambha** – Powder of *Vrdhhadaru* and *Sunthi* should be taken with hot water. It alleviates *Urustambha*.

6. **As Aphrodisiac** – Ghee cooked with *Vrdhhadaru* root should be taken with milk. It is an excellent aphrodisiac and should be used by those desiring progeny.

7. **Piles** – It comes in *Nagaradi modaka*.

Formulation & Preparations

- *Vrdhhadaru Kusama curna*
- *Vrdhhadaruka kalpa*
- *Nagaradi modaka*
- Banovit Capsule
- Confido Tablet

Research Studies

Aphrodisiac activity

The root, flower and to some extent leaf of the plant showed aphrodisiac activity as evidenced by an increase in mounting behavior of mice. The plant is valuable in development of effective medicine for stimulating male sexual activity with an influence on sex ratio favoring males⁴⁶. A preparation 'Fortege' made from *Withania somnifera*, *Mucuna pruriens*, *Argyreia speciosa*, *Leptadenia reticulata* and *Anacyclus pyrethrum* is used for curing common male sexual disorders⁴⁷. A product containing dried roots of *Argyreia speciosa* is effective to treat male impotence and sterility as evidenced by increase in testosterone level in alcohol-exposed rats⁴⁸.

Immunomodulatory activity

A 95% ethanolic extract of dried root of *A. speciosa* was reported to stimulate both cellular and humoral immunity⁴⁹.

Hepatoprotective and antioxidant activity

Ethanol extract and ethyl acetate extract (200 mg and 400 mg/kg) of *A. speciosa* root showed hepatoprotective activity against carbon tetrachloride induced hepatotoxicity in rats. They also showed *in vivo* antioxidant activity against oxidative stress in rats⁵⁰.

Analgesic and anti-inflammatory activity

The alcoholic extract of the roots (50, 100 and 200 mg/kg) exhibited statistically significant anti-

inflammatory activity against granuloma formation technique in the albino rats. The extract did not show much activity against formalin-induced arthritis in rats⁵¹. A 95% ethanolic extract of root (50-200 mg/kg p.o.) was effective against carrageenan-induced paw edema and adjuvant induced arthritis⁵².

Hypoglycemic activity

The alcoholic extract of *A. speciosa* (250, 500 and 750 mg/kg, p.o.) showed significant dose-dependent percentage blood glucose reduction in normal and in alloxan-induced diabetic rats at 8 h⁵³. The dried seeds of *A. speciosa* also possess hypoglycemic activity⁵⁴.

Antidiarrheal activity

The 50% ethanolic extract of flowers of *A. speciosa* (50, 100 and 150 mg/kg, p.o.) have significant antidiarrheal activity⁵⁵.

Antimicrobial activity

The alcoholic extract of the leaves revealed antibacterial activity against *Staphylococcus aureus* but was inactive against *Escherichia coli*. The aqueous extract was inactive against both the bacteria⁵⁶.

Antiviral activity

The extract of the plant and fruits had interferon-like antiviral activity against vaccinia virus in CAM (chorioallantoic membranes) cultures, but was devoid of any activity against Ranikhet disease virus⁵⁷.

Antiulcer activity

A 50% ethanolic extract of the flower of *A. speciosa* (100-200 mg/kg, p.o.) showed ulcer protective effect in ethanol, aspirin, stress and fourth pylorus ligation induced gastric ulceration in rats⁵⁸.

Anticonvulsant activity

The hydroalcoholic extract of *A. speciosa* roots (200 and 400 mg/kg, p.o.) significantly delayed the latency to the onset of first clonus as well as onset of death in unprotected mice and exhibited protection of pentylenetetrazole (80 mg/kg, s.c.) treated mice. Whereas in case of maximal electroshock seizures, hydroalcoholic extract of *Argyrea speciosa* roots (200 and 400 mg/kg, p.o.) significantly reduced the duration of hind limb extension in mice and both the doses were statistically found to be equipotent⁵⁹.

Central nervous depressant activity

Central nervous system depressant activity was observed with n-hexane, chloroform, ethyl acetate and the remaining water fractions of hydroalcoholic extract of *A. speciosa* roots (100, 200 and 500 mg/kg, p.o.) as indicated by the results in which they reduced spontaneous motor activity and potentiated pentobarbital induced hypnosis in mice⁶⁰.

CONCLUSION

This review reflects the importance of *Argyrea speciosa* Sweet, it has various medicinal properties & is widely used in Ayurveda. It is a plant of Indian Medical Lexicons. Plant has reported to contain many phytoconstituents. Its seeds contain various ergoline alkaloids such as ergine. The seeds contain the highest concentration of psychoactive compounds in the entire family Convolvulaceae. Traditionally, it is mainly used in

Amavata, Arsas, Sotha, Prameha, Agnimandya. Therapeutically prove action of *Argyrea speciosa* Sweet. in aphrodisiac, immunomodulatory, hepatoprotective, antioxidant, antiinflammatory, antihyperglycemic, anti-diarrheal, antimicrobial, antiviral, antiulcer, anti-convulsant, analgesic and central nervous depressant activities. This will also provide valuable information which will help in getting more advanced knowledge about *Vrdhhadaru* & its variable uses.

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