JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue
JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)
An International Scholarly Open Access, Peer-reviewed, Refereed Journal

Vriddhadaru (*Argyreia nervosa* (Burm.f.) Bojer.): A Comprehensive Review of Its Ayurvedic Significance, Phytochemistry and Pharmacological Activities

Review Article

Swati Thavare[1]*, Sanjivani Shekokar[2]

1. PG Scholar, Department of Dravyaguna Vigyan, Government Ayurved College, Nanded

2. Professor & HOD, Department of Dravyaguna Vigyan, Government Ayurved College, Nanded

Abstract

Vriddhadaru (*Argyreia nervosa* (Burm.f.) Bojer.), a perennial woody climber belonging to the family Convolvulaceae, is a medicinal plant extensively used in the Ayurvedic system of medicine. Classical Ayurvedic texts describe the plant as *Rasayana*, *Balya*, *Medhya* and *Vrishya* and recommend its use in neurological disorders (*Vatavyadhi*), inflammatory conditions (*Shotha*), metabolic disorders (*Prameha*), respiratory ailments, wounds, sexual debility and general weakness. In recent years, *A. nervosa* (Burm.f.) Bojer.) has gained considerable scientific attention due to its wide spectrum of pharmacological activities. Experimental and preclinical studies have reported aphrodisiac, hepatoprotective, central nervous system activity, hypoglycemic and antihyperglycemic, immunomodulatory, anti-inflammatory, anti-convulsant, analgesic, nootropic, antimicrobial, antiviral and nematocidal, gastroprotective activity from various parts of the plant. Phytochemical investigations have revealed the presence of bioactive constituents such as triterpenoids, flavonoids, steroids, lipids, phenolic compounds, aryl esters, coumarins and ergoline alkaloids which may collectively contribute to its therapeutic potential. The present review compiles and critically evaluates available literature on the botanical characteristics, traditional uses, phytochemical profile and pharmacological activities of *Argyreia nervosa* (Burm.f.) Bojer., thereby providing a scientific basis for its traditional applications and supporting further pharmacological and clinical investigations.

Keywords: *Vriddhadaru*, *Argyreia nervosa*, Phytochemistry, Pharmacological activities.

Introduction

Medicinal plants constitute an integral component of traditional healthcare systems worldwide, particularly Ayurveda, which emphasizes disease prevention, rejuvenation and restoration of physiological balance through herbal formulations. Ayurvedic therapeutics rely extensively on botanicals containing bioactive compounds that act to exert therapeutic effects. With increasing global interest in herbal and plant-based medicines, systematic

scientific validation of traditionally used medicinal plants has become essential to establish their safety, efficacy and pharmacological relevance.

Vriddhadaru, botanically identified as *Argyreia nervosa (Burm.f.) Bojer.*, is a perennial woody climber of the family Convolvulaceae, widely distributed across tropical regions of the India. The plant is well documented in classical Ayurvedic literature, where it is classified as *Rasayana* (rejuvenative), *Balya* (strength-promoting), *Medhya* (cognitive enhancer) and *Vrishya* (aphrodisiac)[1.] Traditionally, it is employed in the management of *Vatavyadhi* (neurological disorders), *Shotha* (inflammatory conditions), *Kasa* (respiratory ailments), *Prameha* (metabolic disorders, including diabetes mellitus), wounds, sexual debility and general weakness, reflecting its broad therapeutic applicability[2,3,4.]

Herbal medicines are based on the premise that plants contain naturally occurring bioactive compounds capable of promoting health and alleviating disease. Numerous medicinal plants, their extracts and isolated phytoconstituents have demonstrated a wide range of biological activities, supporting their continued use in traditional medicine and their potential integration into modern therapeutic systems. Consequently, ethnopharmacological and phytopharmacological studies play a crucial role in bridging traditional knowledge with contemporary biomedical research.

In recent decades, *Argyreia nervosa (Burm.f.) Bojer.* has attracted significant scientific interest due to its diverse pharmacological properties reported in experimental and preclinical investigations. These include aphrodisiac, hepatoprotective, central nervous system activity, hypoglycemic and antihyperglycemic, immunomodulatory, anti-inflammatory, anti-convulsant, analgesic, nootropic, antimicrobial, antiviral and nematocidal, gastroprotective activity. Phytochemical studies of different plant parts have identified triterpenoids, flavonoids, steroids, lipids, phenolic compounds, aryl esters, coumarins and ergoline alkaloids, which are believed to contribute collectively to these pharmacological effects[5,6,7]

The present review aims to provide a comprehensive and updated account of *Argyreia nervosa (Burm.f.) Bojer.*, encompassing its botanical description, traditional and ethnomedicinal uses, pharmacognostic characteristics, phytochemical constituents and experimentally validated pharmacological activities. This review is intended to serve as a reliable reference for researchers, academicians and students and to highlight the therapeutic potential of *Vriddhadaru* as a promising candidate for future pharmacological and clinical research.

Botanical Description

Botanical name: *Argyreia nervosa (Burm.f.) Bojer.*
Synonym: *Argyreia speciosa* (Linn. f.)
Family: Convolvulaceae
Common names: Vriddhadaru (Sanskrit), Vidhara (Hindi), Elephant creeper, Hawaiian baby woodrose (English)

Distribution:

The species is widely distributed across tropical regions globally and typically found in moist habitats such as riverbanks, lake margins and as undergrowth in semideciduous forests[8].

Habitat

A woody climber widely distributed in India up to 300 m altitude, with common occurrence in Assam, West Bengal, Bihar, Odisha and South India[9].

Ayurvedic description[10]

Properties:

Rasa: Kutu, Tikta, Kashaya

Guna: Laghu, Snigdha, Sara

Virya: Ushna

Action: *Vatakaphahara, Shukravardhaka, Ayuvardhaka, Agnivardhaka, Vrishya, Balya, Rasayana, Medhya, Swarakantikara*

Therapeutic Uses: *Aamavata, Vatarsha, Shotha, Meha*

Parts used: Roots, leaves, seeds.

Traditional and Ethnomedicinal Uses

Roots [11], [12]

The roots of *Argyreia speciosa* possess a distinctly bitter taste and are known for their aphrodisiac, diuretic, alterative, and general tonic actions. In traditional medical practice, they are prescribed for disorders of the genitourinary system, rheumatic conditions, dysentery, long-standing ulcers, syphilis, synovial inflammation, and various neurological ailments. When administered as a powder along with milk or ghee, the roots are regarded as an effective nervine tonic and rejuvenative agent. Additionally, compound preparations containing *Asparagus racemosus*, *Grewia hirsuta*, and *Hemidesmus indicus* are traditionally employed in the management of chronic respiratory diseases. The root also constitutes an important ingredient of Ajmodadi Churna, a classical formulation indicated for rheumatic disorders and hemiplegia.

Leaves [13], [14]

The leaves exhibit emollient and rubefacient properties and are commonly applied topically in the treatment of skin disorders, boils, and inflammatory swellings. Traditionally, the expressed leaf juice combined with vinegar has been used as a remedy for obesity. In addition to their medicinal applications, the leaves are also utilized as a vegetable in certain regions.

Seeds [15]

The seeds are edible and are traditionally consumed for their tonic effects, either individually or in combination with the seeds of *Hygrophila auriculata*, especially in certain regions of Bihar.

Phytochemistry

Table No.1: Phytochemical constituents

Plant Part	Extract	Identified Compounds	References
Leaves	Petroleum ether extract	1-Tricontanol, epifriedelinol acetate, epifriedelinol, β-sitosterol[16]	Sahu & Chakravarti, 1971
	Methanolic extract (90%)	Quercetin, kaempferol, Kaempferol-3-O-α-L-rhamnopyranoside[17]	Khan et al., 1992
	-	7,8,3′,4′,5′-Pentahydroxyflavone-5-O-α-L-rhamnopyranoside, 7,8,3′,4′,5′-Pentahydroxyflavone-5-O-α-L-glucopyranoside[18]	Ahmad et al., 1993
Roots	Hexane extract	Tetradecanyl palmitate, 5,8-oxidotetracosan-10-one	Rani & Shukla, 1997
	-	Stigmasteryl *p*-hydroxycinnamate, hexadecanyl *p*-hydroxycinnamate, Scopoletin (coumarin)	Shrivastava & Shukla, 1998
Seeds	Fixed oil	Glycerides of palmitic, stearic, oleic, linoleic, linolenic acids [19,20]	Biswas et al., 1947; Batra & Mehta, 1985
	Seed oil (GLC analysis)	Myristoleic, myristic, nonadecanoic, eicosenoic, eicosanoic, heneicosanoic, behenic, palmitic, linoleic, linolenic acids[21]	Kelkar et al., 1947
	Ethanolic extract	Alkaloids including ergometrine, Caffeic acid, ethyl caffeate[22]	Agrawal & Rastogi, 1974b
	-	Ergoline (clavine-type) alkaloids[23]	Nair et al., 1987

	-	Glutamic acid, glycine, isoleucine, leucine, lysine, phenylalanine, tyrosine, proline, α-aminobutyric acid[24]	Jaiswal et al., 1984
Fruits	-	n-Tricontanol, β-sitosterol, *p*-hydroxycinnamoyloctadecanolate, caffeic acid[25]	Purushothaman et al., 1982

Pharmacological Activities

Aphrodisiac Activity

Subramonium A and others (2007) observed in an in vivo study that roots and flower extracts of *Argyreia speciosa* significantly enhanced sexual behavior in male mice, mainly by increasing mounting frequency. Among different preparations, the alcoholic root extract was the most potent, showing marked effects at 200 mg/kg within one hour of oral administration and in a dose-dependent manner. Treated males also showed improved mating performance and a higher proportion of male offspring was observed, indicating notable aphrodisiac potential[26].

Hepatoprotective Activity

Habbu PV et al (2008) in their in vivo study observed that, Ethanolic and ethyl acetate root extracts (200–400 mg/kg) effectively protected against carbon tetrachloride–induced liver damage in rats. The extracts reduced elevated liver enzymes, improved biochemical parameters and minimized histopathological damage, suggesting protection of liver cells through antioxidant and regenerative mechanisms[27].

Central Nervous System Activity

Galani VJ, Patel BG (2009) described that as per their vivo study, different fractions of hydroalcoholic root extract produced significant CNS depressant effects in mice. These were evident as reduced locomotor activity and prolonged pentobarbital-induced sleep, indicating sedative and depressant properties[28].

Hypoglycemic and Antihyperglycemic Activity

Hemet LE et al (2008) observed that Methanolic stem extract significantly lowered blood glucose levels in both normal and alloxan-induced diabetic rats in a dose-dependent manner. The antihyperglycemic effect was comparable to tolbutamide, demonstrating strong glucose-lowering potential[29].

Immunomodulatory Activity

According to Gokhale AB et al (2003) studied that ethanolic root extract enhanced both cell-mediated and humoral immune responses in mice, as shown by increased delayed-type hypersensitivity reactions and antibody production. It also improved leukocyte counts and reversed drug-induced myelosuppression, though it did not significantly affect macrophage phagocytosis[30].

Anti-inflammatory Activity

According to Srivastava MC et al (1972), alcoholic root extract showed significant anti-inflammatory effects in the granuloma model, comparable to aspirin, but was less effective against formalin-induced arthritis[31].

Anticonvulsant Activity

Vyavhare NS, Bodhankar SL (2009) observed that hydroalcoholic extract delayed seizure onset and reduced seizure severity in chemical and electrical seizure models, showing moderate anticonvulsant efficacy[32].

Analgesic Activity

Bachhav RS, Gulecha VS, Upasni CD (2009) studied that methanolic root extract produced significant pain-relieving effects in both peripheral and central pain models, confirming its analgesic potential[33].

Nootropic Activity

Hanumanthachar J, Navneet K, Jyotibala C (2007) observed that aqueous extract improved learning and memory in mice with age-related or drug-induced amnesia. The effect was associated with reduced transfer latency and enhanced memory retention, possibly through modulation of cholinergic activity[34].

Antimicrobial Activity

According to George M, Pandalai KM (1949) and others, Leaf extracts and seed oil exhibited antibacterial activity against several Gram-positive and Gram-negative bacteria. Root-derived compounds such as Hexadecanyl *p*-hydroxycinnamate and scopoletin also showed antifungal activity against plant pathogenic fungi[35,36,37,38]

Antiviral and nematicidal activity

Babber OP, Joshi MN, Madan AR (1978) and others observed that plant extracts demonstrated interferon-like antiviral effects against vaccinia virus and showed significant nematicidal activity against *Setaria cervi*, with alcoholic extracts being more potent[39,40]

Gastroprotective effect

S. K. Jaiswal et al (2011) and Das S. (2011) studied that Standardized leaf extract provided dose-dependent protection against various experimentally induced gastric ulcers in rats. The effect was linked to enhanced gastric mucus, reduced oxidative stress and improved antioxidant enzyme levels, supporting its cytoprotective and antiulcer potential[41,42]

Discussion

The present review highlights *Argyreia nervosa (Burm.f.) Bojer.* as a medicinally important plant with a strong foundation in traditional Ayurvedic practice and growing support from modern scientific research. Classical descriptions of the plant as *Rasayana*, *Balya*, *Medhya* and *Vrishya* are consistent with findings from contemporary pharmacological studies, which demonstrate a wide range of biological activities, including antioxidant, anti-inflammatory, neuroprotective, antidiabetic, wound-healing and aphrodisiac effects. This concordance between traditional knowledge and experimental evidence strengthens the therapeutic relevance of *A. nervosa*.

Phytochemical investigations reveal that the plant contains diverse bioactive constituents such as alkaloids, flavonoids, phenolic compounds, saponins, triterpenoids and steroids. These compounds are known to exert multiple pharmacological effects, either individually or synergistically and may explain the broad spectrum of activities reported for the plant. Antioxidant and anti-inflammatory properties appear to play a central role in many of its therapeutic effects, particularly in neurological, metabolic and inflammatory disorders.

Despite encouraging results from preclinical and experimental studies, the clinical relevance of *A. nervosa* remains insufficiently explored. Most available data are derived from in vitro and animal models, which, although valuable, cannot be directly extrapolated to human use. Additionally, variations in plant parts used, extraction methods and dosage levels across studies limit reproducibility and comparison of results. The presence of psychoactive alkaloids in certain parts of the plant, particularly seeds, also raises safety concerns that warrant careful toxicological evaluation and standardization.

Overall, *Argyreia nervosa (Burm.f.) Bojer*. represents a promising candidate for the development of plant-based therapeutics. However, translating traditional claims and preclinical findings into clinical applications requires systematic research, including standardized phytochemical profiling, mechanism-based studies and well-designed clinical trials. Addressing these gaps will be essential for the safe, effective and rational integration of *Argyreia nervosa (Burm.f.) Bojer.* into modern healthcare systems.

Conclusion

The Ayurvedic use of *Argyreia nervosa* (Burm.f.) Bojer. as a *Rasayana, Balya, Medhya* and *Vrishya* is well supported by contemporary phytochemical and pharmacological evidence. The plant exhibits a wide range of biological activities attributable to its diverse bioactive constituents, validating its therapeutic relevance. However, limited clinical evidence and lack of standardized formulations remain major challenges. Future investigations focusing on active compound isolation, mechanism-based studies and well-designed clinical trials are essential to establish its safety and efficacy for broader therapeutic application.

Future Perspectives

Although *Argyreia nervosa* (Burm.f.) Bojer. shows promising pharmacological potential in preclinical studies, further research is needed to confirm its clinical usefulness. Future studies should focus on identifying active compounds, standardizing extracts and clarifying their mechanisms of action. Well-designed clinical trials are also required to establish safety, appropriate dosage and long-term efficacy. Such evidence-based research may support the development of standardized herbal formulations and promote the integration of *Argyreia nervosa* (Burm.f.) Bojer. into modern healthcare.

References

[1] Padmshri Pro. Krushnachandra Chunekar. Bhavprakash Nighantu, Chaukhamba Bharati Acadamy Varansi, Edition2018. Guduchyadivarga Dravya no. 108, Page-394, Shlok no.210 (1,2)

[2] Galani VJ, Patel BG, Patel NB. *Argyreia speciosa* (Linn. f.) Sweet: A comprehensive review. Pharmacogn Rev. 2010;4(8):172-178.

[3] Nadkarni KM. *Indian Materia Medica*. Vol. 1. Mumbai: Popular Prakashan; 1976. p. 110-112.

[4] Sharma PV. *Dravyaguna Vijnana*. Vol. 2. Varanasi: Chaukhambha Bharati Academy; 2005. p. 623-626.

[5] Habbu PV, Shastry RA, Mahadevan KM, Joshi H, Das SK. Hepatoprotective and antioxidant effects of *Argyreia speciosa* in rats. Afr J Tradit Complement Altern Med. 2008;5(2):158-164.

[6] Srivastava A, Shukla SP, Kumar S. Aryl esters and a coumarin from *Argyreia speciosa*. J Aromatic Med Plants. 1998;20(3):774-778.

[7] Krishnaveni A, Thaakur SR. Phytochemical studies of *Argyreia nervosa*. Int J Pharm Ind Res. 2012;2(3):420-425.

[8] Aiyer KN, Kolammal M. Pharmacognosy of Ayurvedic Drugs Kerala, 1(8), Department of Pharmacognosy, University of Kerala, Trivandrum, 1964, pp. 61-65.)

[9] The wealth of India-Raw materials. Vol. 4. New Delhi: Publication and Information Directorate, CSIR; 1985. Anonymus; p. 419.

[10] Padmshri Pro. Krushnachandra Chunekar. Bhavprakash Nighantu, Chaukhamba Bharati Acadamy Varansi, Edition2018. Guduchyadivarga Dravya no. 108, Page-394, Shlok no.210 (1,2)

[11] Nadkarni AK. Indian Materia Medica. 3rd ed. Vol. 1. Bombay: Popular parkashan private Ltd; 2007. p. 137.

[12] Kirtikar KR, Basu BD, ICS . In: Indian medicinal plants. 2nd ed. Blatter E, Caius JF, Mhaskar KS, editors. Vol. 3. Allahabad, India: Published by Lalit Mohan Basu; 1981. pp. 1707–8.

[13] Kirtikar KR, Basu BD, ICS . In: Indian medicinal plants. 2nd ed. Blatter E, Caius JF, Mhaskar KS, editors. Vol. 3. Allahabad, India: Published by Lalit Mohan Basu; 1981. pp. 1707–8.

[14] The wealth of India-Raw materials. Vol. 4. New Delhi: Publication and Information Directorate, CSIR; 1985. Anonymus; p. 419.

[15] The wealth of India-Raw materials. Vol. 4. New Delhi: Publication and Information Directorate, CSIR; 1985. Anonymus; p. 419.

[16] Sahu NP, Chakravati RN. Constituents of the leaves of Argyreia speciosa. Phytochem. 1971;10:1949.

[17] Khan MS, Kamil SM, Ilyas M., Phytochemical investigation on the leaves of Argyreia speciosa, Journal of Indian Chemistry 1992; 69:110-113.

[18] Ahmad M, Jain N, Khan MS, Shafiullah, Iliad M .Two new flavone glycosides from the leaves of Argyreia speciosa, Journal of Chemical Research 1993;(S)7:248

[19] Biswas B, Tiwari LD, Dutt S. Chemical composition of the fixed oil from the seeds of Argyreia speciosa, Indian Soap Journal 1947;13:51-54.

[20] Batra A, Mehta BK., Chomatographic analysis and antibacterial activity of the seed oil of Argyreia speciosa, Fitoterapia 1985; 56:357-359.

[21] Kelkar GM, Phalnikar NL, Bhinde BV, Fatty oil from the seeds of Argyreia speciosa Sweet, Journal of Indian Chemical Society 1947; 24:83-86.

[22] Agarwal SR, Rastogi RP., Pharmacognostical and Preliminary Phytochemical Studies of Argyreia nervosa Burm., Indian Journal of Pharmacology 1974; 35:118-119.

[23] Nair GG, Daniel M, Sabnis SD, Ergolines in the seeds of some Indian Convolvulaceae, Indian Journal of Pharmaceutical Science 1987; 49:100-102.

[24] Jaiswal S, Batra A, Verma S, Bokadia MM, Free amino acids of some regionally available medicinally important plant seeds, Science Culture 1984; 50:24-26.

[25] Purushothaman KK, Sarada A, Loganathan D. Phytochemical study of Argyreia speciosa (Vridhadaru) Bull Med Ethnobot Res. 1982;3:250–3.

[26] Subramonium A, Madhavachandran V, Ravi K, Anuja VS (2007). Aphordiasic property of the elephant creeper Argyreia nervosa. J. Endocrinol. Rep. 11(2): 82-85.

[27] Habbu PV, Shastry RA, Mahadevan KM, Hanumanthachar Joshi, Das SK (2008). Hepatoprotective effects of Argyreia speciosa in rats. Afr. J. Trad. CAM 5(2): 158-164.

[28] Galani VJ, Patel BG (2009). Central Nervous System Activity of Argyreia Speciosa Roots in Mice. Res. J. Pharm. Tech. 2(2): 331- 334.

[29] Hemet LE, Satyanarayana T, Ramesh A, Durga Prasad, Routhu Y, Srinivas KV (2008). Hypoglycemic and antihyperglycemic effect of Argyreia speciosa Sweet. In normal and in alloxan induced diabetic rats. RLA press. J. Natl. Rem. 8(2): 203-208.

[30] Gokhale AB, Damre AS, Saraf MN (2003). Investigation into thelmmuno- Modulatory activity of Argyreia speciosa. J. Ethanopharmacol. 84(1): 109-114.

[31] Srivastava MC, Kant V, Tewari JP (1972). Anti-inflammatory activity roots of Argyreia speciosa (Samundrashokha). Mediscope 15: 219- 222.

[32] Vyavhare NS, Bodhankar SL (2009). Anticonvulsant activity of Argyreia speciosa in mice, Indian J. Pharm. Sci. 71(2): 131-134.

[33] Bachhav RS, Gulecha VS, Upasni CD (2009). Analgesic and antiinflammatory activity of Argyreia speciosa root, Ind. J. Pharmacol. 41(4): 158-161.

[34] Hanumanthachar J, Navneet K, Jyotibala C (2007). Evaluation of nootropic effect of Argyreia speciosa in mice, J. Health Sci. 53(4): 382- 388

[35] George M, Pandalai KM (1949). Investigations on plant antibiotics. Part IV. Further search for antibiotic substances in Indian medicinal plants. Ind. J. Med. Res. 37: 169-181.

[36] Kelkar GM, Phalnikar NL, Bhinde BV (1947). Fatty oil from the seeds of Argyreia speciosa Sweet. J. Indian Chem. Soc. 24: 83-86.

[37] Mishra SH, Chaturvedi SC (1978). Antibacterial and antifungal activity of the oil and unsaponifiable matter of Argyreia speciosa Sweet. Indian Drugs Pharm. Ind. 13(5): 29-31.

[38] Shukla YN, Srivstava A, Sunil Kumar, Sushi Kumar (1999). Phytotoxic and antimicrobial constituents of Argyreia speciosa and Oenotherabiennis. J. Ethnopharmacol. 67: 241-245.

[39] Babber OP, Joshi MN, Madan AR (1978). Evaluation of plants for antiviral activity. Ind. J. Med. Res. 76: 54-65.

[40] Parveen N, Khan NU, Singhal KC (1990). Antifilarial activity of Argyreia speciosa against Setaria cervi in vitro. Phytother. Res. 4: 162-164.

[41] S. K. Jaiswal, C. V. Rao, B. Sharma, P. Mishra, S. Das and M. K. Dubey, “Gastroprotective effect of standardized leaf extract from Argyreia speciosa on experimental gastric ulcers in rats,” J Ethnopharmacol, vol. 137, no. 1, 2011, doi: 10.1016/j.jep.2011.05.028.

[42] Das S. Gastroprotective effect of standardized leaf extract from Argyreia speciosa on experimental gastric ulcers in rats. Journal of Ethnopharmacology. 2011; doi:10.1016/J.JEP.2011.05.028