



Review Article

WITHANIA SOMNIFERA: A POTENT UNANI APHRODISIAC DRUG

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Abstract: *Withania somnifera* Dunal commonly known as Asgandh or Ashvaganadha is one of the most potent aphrodisiacs used in traditional systems of medicine. It is common herb found throughout the dried and subtropical parts of India. The root and leaves of plants are used for medicinal purposes. In traditional systems of medicine particularly Ayurveda and Unani the plant is thought to possess anti-inflammatory, stomachic, semenagogue, nervine tonic, sedative, aphrodisiac, lithotriptic, galactagogue and many other important medicinal properties. The plant is also used in preparations of many compound Unani formulations. The review reveals that many phytochemically active constituents have been separated from the plant which act as sedative, hypnotic, GABA mimetic, hypertensive, bradycardiac, anti-stress, antitumor, antiarthritic and antibacterial agents. The separation of chemical constituents from plants and modern scientific studies revalidate Unani and Ayurvedic medicines. This review encompasses the available literature on *Withania somnifera* Dunal, which might be supportive for researchers and scientists to uncover new chemical entities responsible for its claimed traditional uses.

Keywords: Aphrodisiac, Asgandh, Ayurveda, Unani medicine, *Withania somnifera*

INTRODUCTION

Solanaceae, or commonly known as potato family is an economically important family of angiosperms with a global distribution. The family ranges from herbs to trees, and includes a number of important spices, weeds, ornamentals, crops, and medicinal plants out of which *Withania somnifera* commonly known as *Asgandh* or *Ashvaganadha* is one of the most potent aphrodisiacs used in traditional systems of medicine like Unani medicine and Ayurveda. It is distributed throughout the dried and subtropical parts of India. ¹ It grows upto a height of 2–3 ft (about 1 m). Root and leaves are used for medicinal purposes. ^{2,3} The root contains several alkaloids including withanine, withananine, withananine, pseudo-withanine, somnine, somniferine, somniferinine. The leaves of Indian chemotype contain 12 withanolides, including withaferin A. Steroidal lactones of withanolide series have been also isolated from it. ¹ Apart from its aphrodisiac activity it has been used for a number disease ailments like scrofula, ¹ rheumatism, ^{1,4} anxiety neurosis, ¹ generalized weakness, ⁴ inflammation, ⁴ and ulcers, ⁴ due to its anti-inflammatory, ¹ hypnotic, ¹ hepatoprotective, ¹ antibacterial, ¹ diuretic, ^{1,4} antiarthritic, ¹ sedative ⁵ narcotic ⁵ and deobstruent ⁵ properties without any known side effects. ⁶ Its aphrodisiac properties have been also found effective in diabetics, also proved effective in improving semen quality as well as in development of testicles on modern scientific parameters by a number of studies of this era.

VERNACULARS

Language	Name	References
Urdu	Asgandh, Asgand Nagori	7
English	Winter cherry Indian ginseng	5,6,7,8
Arabic	Kakanj Hindi	8
Persian	Asgandh Nagori, Kaknja-e-Hindi	8
Assamese	Asgvagandha	8
Bengali	Ashvagandha, Asvagandha	8
Gujarati	Asgandha, Asundha, Asana, Ghodakun, Asoda, Asan	8
Kannada	Angarberu, Hirenaddina-Hire-gadday, Hiremaddina-Gadday, Virenaddlinagadda	8
Kashmiri	Asgandha	8
Malayalam	Amukkram, Pevette	8
Marathi	Asagandha, Askagandha, Askandhatilli Askandha, Kanchuki	8
Oriya	Asugandha	8
Punjabi	Asgandh, Isgand, Asgandnagar, Aksan	8
Sanskrit	Ashvaganadha, Gandhrapatri, Palashaparni, Varahapatri	8
Tamil	Amukkaram kizargu Amukkuran, Kilangee, Amukkira, Ashuvagandhi	8
Telegu	Pennerugadda, Asvagandhi, Penneru, Penneroogadda	8

HABITAT

It is found in Northern Africa, the Mediterranean and the Middle East.⁶ It is distributed throughout the drier and subtropical parts of India.¹

BOTANICAL DESCRIPTION

Macroscopic: The plant grows to a height of 2–3 ft (about 1 m). Stems and branches are covered with minute star shaped hairs. Leaves are oval and about 10 cm in length. Flowers are greenish yellow, borne in axillary clusters. Fruits are smooth red, raisin-sized.^{4, 6} The roots are straight, unbranched, thickness varying with age, roots bear fiber like secondary roots, outer surface buff to grey-yellow with longitudinal wrinkles; crown consists of 2-6 remains of stem base; stem bases variously thickened; nodes prominent only on the side from where petiole arises, cylindrical, green with longitudinal wrinkles fracture, short and uneven; odour characteristic; taste bitter and acrid.⁸



Fig 1: *Withania somnifera* Fruit and leaves



Fig 2: *Withania somnifera* dried roots

Microscopic: The transverse section of root shows cork exfoliated or crushed; when present isodiametric and non-lignified; cork cambium of 2-4 diffused rows of cells; secondary cortex about twenty layers of compact parenchymatous cells; phloem consists of sieve tubes companion cells, phloem parenchyma; cambium 4-5 rows of tangentially elongated cells; secondary xylem hard forming a closed vascular ring separated by multiseriate medullary rays; a few xylem parenchyma.⁸

Parts Used for medicinal purpose: Root and leaves^{2,3}

Dosage: 5 to 10 g⁸ 3-5 gram³

Action mentioned in Unani medicine

Mohallile Warm (Anti-inflammatory),^{2,3,8} Muqawwie Aam (General tonic),^{2, 8} Muqawwie Meda (Stomachic),⁸ Muwallide Mani (Semenagogue),^{8,3} Musammine Badan,⁸ Musakkine Asab (Nervine tonic),⁸ Munawwim (Sedative),⁸ Muaeqqwie Bah (Aphrodisiac),^{3, 9} Muaeqqwie Rahm,^{3, 9} Mufattite hisat (Lithotriptic)⁹ Mudammile quruh (Ulcer healing),⁹ Muqawwie hafiza⁹ Musaffie dam (Blood purifier),⁹ Mughallize mani,³ Muwallide Sheer (Galactagogue).³

Uses mentioned in Unani medicine

Sailanur Rahem (Leucorrhoea),⁸ Jiryān (Spermatorrhoea),^{3, 8, 9} Riqqate Mani,⁸ Wajul Qutn (Lumbago),⁸ Wajul Mafasil (Arthritis),^{2, 3, 8} Zofe Bah (Sexual weakness),^{3,8} Ghatiya (Rheumatism)⁹ Bars (Viteligo)⁹ Taoon (Plague),⁹ Bawaseere damwi (Bleeding piles),⁹ Waramē Khussiya (Orchitis),⁹ Hisate gurda wa masana (Kidney and bladder calculi),⁹ Nisyan (Amnesia),⁹ Qillate mani (oligospermia).²

IMPORTANT FORMULATIONS

Majoone Sohag, Majoone Salab, Zimade Mohallil, Kushtae Gaodanti.⁸

Side effects

No side effects have been reported with Asgandh.⁶

ETHNOBOTANICAL DESCRIPTION**Action**

Anti-inflammatory,¹ alterative,⁵ aphrodisiac,^{4,5} sedative,¹ hypnotic,¹ hepatoprotective,¹ antibacterial,^{1,10} diuretic,^{1,4} antitumour,¹ antiarthritic,¹ tonic⁴ sedative⁵ narcotic⁵ deobstruent.⁵

Uses

Tumours,¹ sexual weakness,^{4,10} scrofula,¹ rheumatism,^{1,4} anxiety neurosis,¹ generalized weakness,⁴ inflammations,⁴ ulcers,⁴ spermatorrhoea.⁵

CHEMICAL CONSTITUENTS

The root contains several alkaloids, including withanine, withananine, withananine, pseudo-withanine, somnine, somniferine, somniferinine. The leaves of Indian chemotype contain 12 withanolides, including withaferin A. Steroidal lactones of withanolide series have been isolated. Withanine is sedative and hypnotic. Withaferin A is antitumour, antiarthritic and antibacterial. Anti-inflammatory activity has been attributed to biologically active steroids, of which withaferin A is a major component. The activity is comparable to that of hydrocortisone sodium succinate. Withaferin A also showed significantly protective effect against CCl₄ induced hepatotoxicity in rats. The root extract contains an ingredient which has GABA mimetic activity. The free amino acids present in the root include aspartic acid, glycine, tyrosine, alanine, proline, tryptophan, glutamic acid and cystine. The total alkaloids of the root exhibited prolonged hypotensive, bradycardiac and depressant action of the higher cerebral centres in several experimental animals. A withanolide-free aqueous fraction

isolated from the roots of *Withania somnifera* exhibited anti-stress activity in a dose-dependent manner in mice.¹

SCIENTIFIC REPORTS

Anti-stress activity

A study was performed to understand the role of stress in male infertility, and to test the ability of *W. somnifera* to combat stress and treat male infertility. Researchers had selected normozoospermic but infertile individuals ($n = 60$). Normozoospermic fertile men ($n = 60$) were recruited as controls. The subjects were given root powder of *W. somnifera* 5 g/day for 3 months. They measured various biochemical and stress parameters before and after treatment, suggested a definite role of stress in male infertility and the ability of *W. Somnifera* to treat stress-related infertility. Treatment resulted in a decrease in stress, improved the level of anti-oxidants and improved overall semen quality in a significant number of individuals. The treatment resulted in pregnancy in the partners of 14% of the patients.¹¹

Testicular development

Abdel Magied EM et al in a study at evaluated the effect of lyophilized aqueous extract of *Cynomorium coccineum* and *Withania somnifera* on testicular development and on serum levels of testosterone, ICSH and FSH in immature male Wistar rats. There was a notable increase in testicular weight of animals treated with both extracts. Histological examination revealed an apparent increase in the diameter of seminiferous tubules and the number of seminiferous tubular cell layers in the testes of treated rats as compared with control ones.¹²

Thyroid dysfunction

The effects of daily administration of *Withania somnifera* root extract (1.4 g/kg body wt.) and *Bauhinia purpurea* bark extracts (2.5 mg/kg body wt.) for 20 days on thyroid function in female mice were investigated. It was reported that serum tri-iodothyronine (T3) and thyroxine (T4) concentrations were increased significantly by *bauhinia*, *withania* could enhance only serum T4 concentration.¹³

Appetizer activity

In a study alcoholic extracts of *Withania somnifera* was administered for 21 days in stress induced anorexic rats and LPS-induced anorexic rats. The results of study showed that alcoholic root extract of *Withania somnifera* (100 and 300 mg/kg) dose dependently increases food consumption, number of attempts for food consumption and body weight in stress induced anorexic rats and LPS induced anorexic rats.¹⁴

Anthelmintic activity

Shukla Kirtiman et al was tested the hydroalcoholic extracts of *Withania sominifera* against adult *Pheretima posthuma* worms for the evaluation of anthelmintic activity at various concentrations. The results were expressed in terms of time for paralysis and time for death of worms. They showed that the extract exhibited significant wormicidal activity at dose of 40 mg/ml.¹⁵

Antidepressant activity

Jayanthi MK et al carried out an experimental study using 3 models, behavioural despair tests, forced swim test (FST), tail suspension test (TST) and anti-reserpine test. Effect of different doses of Asgandh was studied on behavioural despair tests induced immobility time and reserpine antagonism. It produced dose dependent decrease in immobility time in chronic studies in FST and TST model, maximum effect being observed with the dose 40 mg/kg.¹⁶

Anti microbial activity

The study conducted by Premlata Singariya et al at shows antimicrobial property of *Withania somnifera*, in this study the crude extracts of *Withania somnifera* were successively extracted with polar to non polar solvents using soxhlet assembly. The extracts were then screened for their antimicrobial activity *in-vitro* against one gram positive bacteria (*Bacillus subtilis*), two gram negative bacteria (*Pseudomonas aeruginosa* and *Enterobactor aerogens*) and one fungus (*Aspergillus flavus*) by disc diffusion assay. Serial dilution method was used to determine minimum inhibitory concentration (MIC) and minimum bactericidal/fungicidal concentration. The chloroform extract of calyx of *Withania somnifera* showed highest activity against *B. Subtilis*.¹⁷

Chondroprotective activity

Venil N et al in a study on explant model of human osteoarthritis cartilage found that *W. Somnifera* root powders showed reproducible, statistically significant, short-term chondroprotective activity in 50% of osteoarthritis cases tested in an explant model of human osteoarthritis cartilage damage.¹⁸

Cardioprotective

A study conducted by Das PK et al suggests that the constituents of *Withania somnifera* are structurally similar to digoxin are demonstrated exhibit cardiotoxic activity and provide a salutary effect in CHF.¹⁹

Positive inotropic activity

In a study conducted *Withania somnifera* has been reported to have autonomic ganglion blocking action and myocardial depressant effects and reduce blood pressure due to its positive inotropic and chronotropic Properties.²⁰

Inflammatory bowel disease (IBD)

A study based on concentration dependant antioxidant activity of the extracts of *Withania somnifera* was carried out and results were evaluated using biochemical assays like, inhibition of lipid peroxidation, no scavenging, H₂O₂ scavenging, and ferric reducing power assay. This study supported antioxidant potential of aqueous extract of roots of *Withania somnifera* and it's utility to ameliorate inflammation, which is the key pathology in inflammatory bowel disease (IBD). The topical application in the form of rectal gel formulation proved to be as effective as the mesalamine treatment.²¹

Anti hypertensive activity

Malhotra CL et al in a study to find antihypertensive effects of Asgandh revealed that the alkaloids had a prolonged

hypotensive, bradycardiac and respiratory-stimulant actions.²²

Anti diabetic properties

A clinical trial was conducted to assess antidiabetic activity of poly-herbal formulation containing *Withania somnifera*. It was concluded that the formulation was efficient in reducing higher sugar level, potentiating the immune system and improving the anti-oxidant status of diabetic patients.²³

Anti-Lieshmaniasis activity

In a study the immunomodulatory and nephroprotective action of *Withania somnifera* in cisplatin-treated leishmania donovani-infected balb/c mice was investigated. *W. Somnifera* (350 mg/kg b.wt. Daily for 15 days, orally) when given along with cisplatin, significantly reversed the liver and kidney adverse effects and enhanced the anti-leishmanial efficacy of cisplatin. But, when *W. Somnifera* was given alone it showed less anti-leishmanial potential. These results confirm the protective and immunomodulatory activity of *W. Somnifera* suggesting that along with cisplatin it may be a critical remedy for the amelioration of adverse effects of cisplatin. Thus, this combination provides a hope for treatment of kala azar.²⁴

Osteoarthritis

Kulkarni RR et al in a double blind study revealed the clinical efficacy of a herbomineral formulation containing roots of *Withania somnifera*. The results showed that treatment with the herbomineral formulation produced a significant drop in severity of pain and disability score. Radiological assessment, however, did not show any significant changes in both the groups.²⁵

Analgesic activity

Twajj et al in a study stated the analgesic effects of Asgandh that soothes nervous system from pain response and hence used as potent analgesic in traditional system of medicine.²⁶

Hypothyroidism

Studies on animal models revealed Asgandh has a thyrotropic effect. An aqueous extract of dried withania root was given to mice via gastric intubation at a dose of 1.4 g/kg body weight daily for 20 days. Serum was collected at the end of the 20 day period and analyzed for T3 and T4 concentrations and lipid peroxidation was measured in liver homogenate via antioxidant enzyme activity. Significant increases in serum T4 were observed, indicating the plant has a stimulatory effect at the glandular level.²⁷

CONCLUSION

W.Somnifera plant has been explored exhaustively for its photochemical and pharmacological properties with reference to traditional medicine. It is revealed that the plant has been used ethno-medicinally as an important therapeutic agent for a number of disease ailments cited in this review, also experimental studies carried out on modern scientific parameters reproves the claims of Unani and Ayurveda medicines and further researchers are needed to find out other important medicinal uses of Asgandh.

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