Egyptian Herbal Monograph

Volume 1

Wild Medicinal Plants

Egyptian Drug Authority (EDA)

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***Withania somnifera* (L.) Dunal** سم فراخ

1. Names & Synonyms (1-4)

***Withania somnifera* (L.) Dunal**

Syns.: *Alicabon somniferum* (L.) Raf., *Physalis somnifera* L., *Physaloides somnifera* (L.) Moench.

Family: Solanaceae

Arabic: Sem Ferakh سم فراخ

English name: Ashwagandha, Winter-cherry.

2. Geographical distribution (4)

- The Nile region, Mediterranean coastal strip as well as all the deserts of the country including that of Sinai.

3. Parts used for medicinal purpose

- Dried roots (5-8).

4. Major chemical constituents (9)

- **Steroidal lactones:** Withanolides (as withaferin A, B, D) (10, 11).
- **Alkaloids** (12): Withanine, somniferine, somnine, withanmine, pseudowithamine, and withanaminine (13), tropine, choline, pseudotropine, *dl*-isopelletierine, cuscohygrine, anahygrine,and anaferine (14).
- **Others:** terpenoids, saponins, phenolics, flavonoids, phytophenols, and glycosides.

5. Traditional Medicinal Uses (5-8)

A. As a sleep aid

B. Memory enhancement

C. An adaptogen to help increase energy and resistance to stress (e.g., in case of mental and physical fatigue related to stress.

***W. somnifera* is a traditional medicinal plant for use in the specified indications based exclusively upon long-standing use.**

6. Herbal preparations correlated to medicinal use (5,6)

1. Comminuted herbal substances are added to water as herbal tea in the form of decoction or infusion.
2. Powdered drug
3. Ethanolic extracts (dry extract, fluid extract, tincture)

Herbal preparations (2-3) are in pharmaceutical dosage forms. The pharmaceutical form should be described by the pharmacopoeia full standard term.

7. Posology and method of administration correlated to medicinal use (5-7)

Preparations 1 - 3
Indications A and B
Adults and elderly: 2 - 6 g daily of the dried root or equivalent preparations.

Preparation 2
Indication C
Adults and elderly: 2.5-6.5 g daily of the dried root or equivalent preparations (5,8,15,16).
Powdered crude drug: 3–6 g of the dried powdered root (8).

Preparation 3
Adults and elderly:
- 250 mg, twice daily (8).
- 300 - 500 mg of an extract standardized to contain 1.5 % withanolides (15).
- 6 - 12 ml of a 1:2 fluid extract, daily (15).

Duration of use

- If the symptoms persist longer than 4 weeks (for indication A (5)) and 3 months (for indications B and C (6)) during the use of the medicinal product, a doctor or a pharmacist should be consulted.

Method of administration: Oral use (5).

8. Contraindications

- Hypersensitivity to the active substances and to other plants of the same family.
- Due to its immunomodulatory effects, it has been suggested that Ashwagandha should be avoided in autoimmune diseases such as lupus and multiple sclerosis (7).
- Existing or previous liver disorders (17, 18).

9. Special warnings and precautions for use

- If the symptoms worsen during the use of the medicinal product, a doctor or a pharmacist should be consulted.
- Use with caution in peptic ulcer; Ashwagandha may cause gastrointestinal irritation (6).
- The use is not recommended in patients below 18 years of age due to insufficient data on safety (5, 7).
- In case of yellowing of the skin or eyes, dark urine, nausea, vomiting, unusual tiredness, weakness, stomach or abdominal pain or loss of appetite, the medicinal product should be stopped and a medical advice should be seeked (17, 18).

10. Interactions with other medicinal products and other forms of interaction

- Avoid taking with alcohol or products that cause drowsiness (5).
- The crude drug may potentiate the effects of barbiturates and reduce the effects of diazepam and clonazepam (8, 16).
- There is limited evidence to suggest that it may increase thyroid hormone levels and may therefore interfere in control of hypo- and hyperthyroidism (7).

11. Fertility, pregnancy and lactation

- Use during pregnancy is contraindicated (8,16) due to a reputed abortifacient activity (6).
- Use during breastfeeding is contraindicated (8).
- No fertility data available (8).

12. Effects on ability to drive and use machines (5)

- May impair ability to drive and use machines. Affected patients should not drive, operate machinery or be involved in activities requiring mental alertness.

13. Undesirable effects

- If adverse reactions occur, a doctor or a pharmacist should be consulted.
- Some people may experience drowsiness (5).
- Sudden and potentially severe gastrointestinal symptoms including nausea, vomiting and diarrhoea in some people (8, 17, 18).
- In very rare cases, it may cause severe liver injury (17, 18).

14. Overdose

- Irritation to mucous and serous membranes resulting gastrointestinal upset, diarrhoea and vomiting (6,16).

15. Relevant biological activities

Treatment of sleep disorders

- Administration of Ashwagandha root extract to patients for 10 weeks (300 mg of the extract was administered twice daily) significantly improved the quality of sleep and also made it easier and faster to fall asleep (19).
- Studies have been conducted in older people aged 65–80 years to assess the safety, efficacy and tolerability of Ashwagandha root extract. The tested treatment was found to be safe and effective, and the participants showed good tolerance (20).
- A group of healthy individuals exhibiting symptoms of non-restorative sleep (NRS) were administered 120 mg of standardised ashwagandha extract once daily for 6 weeks. It was observed that 72% of the subjects improved their sleep quality compared to 29% in the placebo group. There was a significant improvement in sleep duration and total sleep time, as well as an improvement in WASO (wake after sleep onset). Significant improvements in physical, psychological, and environmental areas were also noted. No treatment-related side effects were reported throughout the course of the study (21).
- A number of studies showed that Ashwagandha significantly impacts the deterioration of mood and cognitive and motor functions. It occurs when insufficient sleep leads to reduced efficiency, impaired alertness and a deterioration in overall health (22-24).

- The effect of *Withania somnifera* extract was conducted on adult male rats where the animals were subjected to sleep deprivation for one week and indicators of oxidative stress were measured. A reduction in antioxidant enzyme levels was observed in the sleep-deprived rat group. A significant reduction in the levels of free radicals and lipid peroxidation and an increase in the levels of antioxidant enzymes were observed in the group treated. Levels of dopamine and serotonin also increased compared to the untreated control group. It can therefore be concluded that *Withania somnifera* is an effective therapeutic agent for the treatment of sleep deprivation (25).

Anxiolytic and anti-stress effects

- A study was conducted on a group of patients diagnosed with Generalized Anxiety Disorder (GAD). Participants were treated with Selective Serotonin Reuptake Inhibitors (SSRIs) and also took one capsule of Ashwagandha extract daily for six weeks. After the experiment, it was concluded that *Withania somnifera* extract could potentially support SSRI therapy in patients diagnosed with GAD syndrome (26).

- Ashwagandha supplementation statistically and significantly reduced Hamilton Anxiety Rating Scale (HAM-A) and to a slightly lesser extent, reduced Depression, Anxiety and Stress Scale (DASS-21). A reduction in morning cortisol and DHEA-S levels was also observed. A significant reduction in perceived stress scale (PSS) scores was observed (27-29).

- A study was conducted using a sustained-release capsule containing Ashwagandha root extract (300mg). Participants took one Ashwagandha capsule daily for 90 consecutive days. It was noted that treatment with *Withania somnifera* once daily with one capsule significantly improved memory and attention, sleep quality and overall psychological well-being. A reduction in stress levels was also noted. The treatment appeared to be safe and well tolerated (30).

- A group of patients with schizophrenia, depression and anxiety disorders were treated with standardised *Withania somnifera* extract. The results of the study suggested that the extract had promising effects in the treatment of patients with depression, anxiety disorders and schizophrenia (31).

- Administration of the plant extract to patients resulted in a reduction in negative, general, and total Positive and Negative Syndrome Scale (PANSS) symptoms compared to placebo. There was a significant improvement in Perceived Stress Scale (PPS) scores. These significant improvements were noted in the study group, and they experienced only minimal side effects (32).

Adaptogenic Effect

- A study was conducted on a group of horses given Ashwagandha root extract. The animals were subjected to various stressors, such as heavy exercise, separation and noise.

Haematological, biochemical, hormonal, and immunological parameters were studied during the experiment. After 21 days, a statistically significant decrease in cortisol, epinephrine, glucose, triglycerides, creatinine, IL-6, alanine aminotransferase and aspartate aminotransferase were observed in the treated group. This indicates the adaptogenic, antioxidant and immunostimulating effects of Ashwagandha (33).

- The adaptogenic effects of the standardised extract was studied in rats subjected to chronic stress (CS) using the Footshock method. Chronic stress induced the induction of hyperglycaemia, glucose intolerance, elevated plasma corticosterone levels, increased gastric ulcers, sexual dysfunction, cognitive deficits, immunosuppression, and mental depression. The entire range of the disorders was significantly alleviated by the administration of the extract prior to the stressor (34).
- The effect of an aqueous fraction devoid of withanolides, which was isolated from the root of Ashwagandha, was studied. The study investigated the adaptogenic activity of withanolide-free aqueous fraction from the roots in rats and found that it exhibited significant anti-stress effects, including improved swimming endurance and reduced adrenal gland weight, without causing any adverse effects (35).
- A double-blind, placebo-controlled clinical trial assessed the effects of the root (250 mg twice daily) on psychomotor performance in 30 healthy volunteers. The effects were compared with those of Panax ginseng (100 mg twice daily). Test parameters included tapping, cancellation test, mental mathematical calculations, logical deductions, choice reaction times and auditory reactions. The performance of both groups was superior to that of subjects who received a placebo and the performance of subjects given the crude drug was superior to that of those given Panax ginseng after 40 days of treatment (36).

16. Additional Information

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17. Date of last revision

17/14/2024.

References

1.	www.powo.science.kew.org
2.	Boulos, L. (2000). Flora of Egypt, Al Hadara Publishing, Cairo, Egypt.
3.	Batanouny, K. H. (1999). Wild Medicinal Plants in Egypt (with contribution: Aboutabl, E., Shabana, M. and Soliman, F.). Academy of Scientific Research and Technology, Egypt. The World Conservation Union (IUCN).
4.	El Kholy, A. and Ahmed, F. (2021). *Withania somnifera* L. In: Egyptian Encyclopedia of Wild Medicinal Plants, 10, 401-423. Academy of Scientific Research and Technology, Cairo, Egypt.
5.	Natural Health Product Ashwagandha – *Withania somnifera* (2019). Health Canada, https://webprod.hc-sc.gc.ca/nhpid-bdipsn/atReq.do?atid=ashwagandha&lang=eng
6.	Braun, L. and Cohen, M. (2010). Herbs and Natural Supplements - An evidence-based guide. 3rd edition, Churchill Livingstone. ISBN: 978 0 7295 3910 4.
7.	Edwards, S. E., Rocha, I. C., Williamson, E. M. and Heinrich, M. (2015). Phytopharmacy: An Evidence-Based Guide to Herbal Medicinal Products. 1st edition, John Wiley & Sons, Ltd. ISBN: 978-1-118-54356-6.
8.	WHO monographs on selected medicinal plants (2009). Monographs on selected medicinal plants, **4**, 373-391.
9.	Saleem, S., Muhammad, G., Hussain, M. A., Altaf, M. and Bukhari, S. N. A. (2020). *Withania somnifera* L.: Insights into the phytochemical profile, therapeutic potential, clinical trials, and future prospective. *Iran J Basic Med Sci.*, **23**(12), 1501-1526. doi: 10.22038/IJBMS.2020.44254.10378. PMID: 33489024; PMCID: PMC7811807.
10.	Lavie, D., Kirson, I., Glotter, E., Rabinovich, D. and Shakked, Z. (1972). Crystal and molecular structure of withanolide E, a new natural steroidal lactone with a 17α–side–chain. J. Chem. Soc. Chem. Comm., 15, 877–878.
11.	Sharifi-Rad, J., Quispe, C., Ayatollahi, S. A., Kobarfard, F., Staniak, M., Stępień, A., Czopek, K., Sen, S., Acharya, K., Matthews, K. R., Sener, B., Devkota, H. P., Kırkın, C., Özçelik, B., Victoriano, M., Martorell, M., Suleria, H. A. R., Alshehri, M. M., Chandran, D., Kumar, M., Cruz-Martins, N. and Cho, W. C. (2021). Chemical composition, biological activity, and health-promoting effects of *Withania somnifera* for pharma-food industry applications. *Journal of Food Quality*, Article ID 8985179, 14 pages. https://doi.org/10.1155/2021/8985179
12.	Atal, C. K., Dhar, K. L., Gupta, O. P. and Raghunathan, K. (1975). Pharmacognosy and phytochemistry of *Withania somnifera* (Linn) Dunal (Ashwagandha) New Delhi: Central Council for Research in Indian Medicine and Homeopathy.

13.	Majumdar, D. N. (1952). Alkaloid constituents of *Withania somnifera*. *Curr. Sci*., 21, 46–48.
14.	Schwarting, A. E., Bobbit, J. M., Rother, A., Atal, C. K., Khanna, K. L. and Leary, J. D. (1963). The alkaloids of *Withania somnifera*. *Llyoida*, **26**, 258–273.
15.	*Withania somnifera* Monograph (2004). *Alternative Medicine Review, A journal of clinical therapeutic*, **9**(2), 211-214.
16.	American Herbal Pharmacopeia and Therapeutic Compendium (2000). Ashwagandha Root *Withania somnifera* Analytical, Quality Control, and Therapeutic Monograph. Editor: Roy Upton Herbalist. ISBN: 1-929425-07-4.
17.	https://www.tga.gov.au/news/safety-alerts/medicines-containing-withania-somnifera-withania-ashwagandha
18.	Philips, C. A.,Valsan, A., Theruvath, A. H., Ravindran, R., Oommen, Tharun T., Rajesh, S., Bishnu, S. and Augustine, P., on behalf of the Liver Research Club India (2023). Ashwagandha-induced liver injury- A case series from India and literature review. *Hepatology communications,* 7(10): e0270. DOI: 10.1097/HC9.0000000000000270.
19.	Nayak, S., Nayak, S., Panda, B. K. and Das, S. (2015). A Clinical study on management of stress in type-2 diabetes mellitus (Madhumeha) with Ashwagandha (*Withania Somnifera*). *Ayushdhara*, **2**, 413–417.
20.	Kelgane, S. B., Salve, J., Sampara, P. and Debnath, K. (2020). Efficacy and tolerability of Ashwagandha root extract in the elderly for improvement of general well-being and sleep: A prospective, randomized, double-blind, placebo-controlled study. *Cureus*, **12**, e7083.
21.	Deshpande, A., Irani, N., Balkrishnan, R. and Benny, I. R. (2020). A randomized, double blind, placebo controlled study to evaluate the effects of Ashwagandha (*Withania somnifera*) extract on sleep quality in healthy adults. *Sleep Med*., **72**, 28–36.
22.	Durmer, J. S. and Dinges, D. F. (2005). Neurocognitive consequences of sleep deprivation. *Semin. Neurol*., **25**, 117–129.
23.	Gaine, M. E., Chatterjee, S. and Abel, T. (2018). Sleep deprivation and the epigenome. *Front. Neural Circuits*, **12**, 14.
24.	Abrams, R. M. (2015). Sleep deprivation. *Obstet. Gynecol. Clin. North Am*., **42**, 493–506.
25.	Suganya, K., Kayalvizhi, E., Yuvaraj, R., Chandrasekar, M., Kavitha, U. and Suresh, K. K. (2020). Effect of *Withania somnifera* on the antioxidant and neurotransmitter status in sleep deprivation induced Wistar rats. *Bioinformation*, **16**, 631–637.
26.	Fuladi, S., Emami, S. A., Mohammadpour, A. H., Karimani, A., Manteghi, A. A. and Sahebkar, A. (2021). Assessment of the efficacy of *Withania somnifera* root extract in patients with generalized anxiety disorder: A randomized double-blind placebo-controlled trial. *Curr. Rev. Clin. Exp. Pharmacol.,* **16**, 191–196.

27.	Lopresti, A. L., Smith, S. J., Malvi, H., Kodgule, R. and Wane, D. (2019). An investigation into the stress-relieving and pharmacological actions of an Ashwagandha (*Withania somnifera*) extract: A randomized, double-blind, placebo-controlled study. *Medicine*, **98**, e17186.
28.	Salve, J., Pate, S., Debnath, K. and Langade, D. (2019). Adaptogenic and anxiolytic effects of Ashwagandha root extract in healthy adults: A double-blind, randomized, placebo-controlled clinical study. *Cureus*, 11, e6466.
29.	Pratte, M. A., Nanavati, K. B., Young, V. and Morley, C. P. (2014). An alternative treatment for anxiety: A systematic review of human trial results reported for the Ayurvedic herb Ashwagandha (*Withania somnifera*). *J. Altern. Complement. Med*., **20**, 901–908.
30.	Gopukumar, K., Thanawala, S., Somepalli, V., Rao, T. S. S., Thamatam, V. B. and Chauhan, S. (2021). Efficacy and safety of Ashwagandha root extract on cognitive functions in healthy, stressed adults: A randomized, double-blind, placebo-controlled study. *Evid. Based Complement Alternat. Med*., 8254344. doi: 10.1155/2021/8254344. PMID: 34858513; PMCID: PMC8632422.
31.	Gannon, J. M., Brar, J., Rai, A. and Chengappa, K. N. R. (2019). Effects of a standardized extract of *Withania somnifera* (Ashwagandha) on depression and anxiety symptoms in persons with schizophrenia participating in a randomized, placebo-controlled clinical trial. *Ann. Clin. Psychiatry Off. J. Am. Acad. Clin. Psychiatr*., **31**, 123–129.
32.	Chengappa, K. N. R., Brar, J. S., Gannon, J. M. and Schlicht, P.J. (2018). Adjunctive use of a standardized extract of *Withania somnifera* (Ashwagandha) to treat symptom exacerbation in schizophrenia: A randomized, double-blind, placebo-controlled study. *J. Clin. Psychiatry*, 79, 22496.
33.	Priyanka, G., Kumar, A. B., Lakshman, M., Manvitha, V., Kumar, K. B. (2020). Adaptogenic and immunomodulatory activity of Ashwagandha root extract: An experimental study in an equine model. *Front. Vet. Sci*., **7**, 541112. doi: 10.3389/fvets.2020.541112. PMID: 33134345; PMCID: PMC7552885.
34.	Bhattacharya, S. K. and Muruganandam, A.V. (2003). Adaptogenic activity of *Withania somnifera*: An experimental study using a rat model of chronic stress. *Pharmacol. Biochem. Behav*., 75, 547–555.
35.	Singh, B., Saxena, A. K., Chandan, B. K., Gupta, D. K., Bhutani, K. K. and Anand, K. K. (2001). Adaptogenic activity of a novel, withanolide-free aqueous fraction from the roots of *Withania somnifera* Dun. *Phytother. Res*., 15, 311–318.
36.	Karnick, C. R. (1994). Pharmacopoeial Standards of Herbal Plants. Sri Satguru Publications. Delhi, India.