Withania somnifera

TAXONOMIC CLASSIFICATION:[1]

Kingdom: Plantae

Division: Magnoliophyta

Class: Magnoliopsida

Order: Solanales

Family: Solanaceae

Genus: *Withania*

Species: *somnifera*

Vernacular name: Ashwagandha

(https://www.planetayurveda.com/library/ashwagandha-withania-somnifera/)

INTRODUCTION:

Withania somnifera (WS) also known as Ashwagandha, Indian ginseng, winter cherry, horse smell, Kaknaje Hindi, is a well-known medicinal plant in Solanaceae family used in traditional medicine in many countries such as Iran and India[4] Its roots are specifically used in medicinal and clinical applications. It possesses numerous therapeutic actions which include anti-inflammatory, sedative, hypnotic and narcotic. Extracts from this plant have been reported for its anticancer properties.[2] *Withania somnifera* has pharmacological value as an adaptogen, antibiotic, aboritifacient, aphrosidiac, astringent, anti inflammatory, alldeobstruent, diuretic, narcotic, sedative, and tonic. Ashwagandha has been found to provide potent antioxidant protection. It stimulates the activation of immune system cells, such as lymphocytes and phagocytes. Also, it counteracts the effects of stress and generally promote wellness [7]

(https://www.ayurtimes.com/ashwagandha-withania-somnifera/#roots)

W. somnifera is the most commonly found in the drier regions from the Mediterranean through tropical Africa to South Africa and from the Canary and Cape Verde Islands to the Middle East and Arabia, India, Sri Lanka and southern China.[3] It is an erect, evergreen, tonentose shrub about 0.5 to 2 m high. Leaves are simple, ovate, and glabrous. Flower is inconspicuous, greenish or lurid-yellow, inaxillary, umbellete cymes. Fruits are like berries which are globose, orange-red when mature, enclosed in the persistent calyx. It usually flowers and fruits during November-February.[5]

MAJOR CHEMICAL CONSTITUENTS: [6]

The chemical constituents of *Withania somnifera* include alkaloids such as isopelletierine, anaferine, cuseohygrine, anahygrine, etc., steroidal lactones like withanolides, withaferins and saponins. Sitoindosides and acylsterylglucosides in Ashwagandha are anti-stress agents. Active principles of Ashwagandha, for instance the sitoindosides VII-X and Withaferin-A, have been shown to have significant anti-stress activity against acute models of experimental stress.The aerial parts of *Withania somnifera* yielded 5-dehydroxy withanolide-R and withasomniferin-A

PROPERTIES AND USES:[7]

- Antioxidant
- Immunomodulatory Activity
- Adaptogen
- Memory Enhancing,
- Antiparkinsonian,
- Antiinflammatory,
- Antitumor Properties.
- Hypolipidemic Effect
- Anti-Hyperglycaemic Effect
- Cardiovascular Protection
- Anticonvulsant Activity
- Anti-Aging Activity
- Anti-stress
- Aphrodisiac

(https://www.consumerlab.com/answers/side-effects-of-ashwagandha-supplements/ashwagandha-side-effects/

DOSAGE:

As mentioned in Ayurvedic Pharmacology, 3gm to 5 gm of Ashwagandha powder and 2gm to 3gm salts and ashes is safe for consumption [8]

The reference **dosage of Ashwagandha Churna (powder)** is as follows.	
Infants (Up To 1 year)	250 mg *
Children (1 to 3)	500 mg *
Children (4 to 10)	750 mg *
Children (Above 10)	1000 mg *
Adults	3000 mg *
Pregnancy	2000 mg *
Geriatric (Old age)	2000 mg *
Maximum Possible Dosage	12 grams per day (in divided doses)
* Twice a day with Milk	

(https://www.ayurtimes.com/ashwagandha-withania-somnifera/#roots)

SIDE EFFECTS OF EXCESS CONSUMPTION:[9]

- Loose stools
- Upset stomach
- Male breasts/Gynecomastia- Very rare but may occur it Ashwagandha powder is consumed more than 10gm/day for 6 months or more.

RESEARCH:

1. Withania somnifera has a positive effect in the treatment of infertility both in malesand females. This study assessed the role of stress in male infertility the ability of W. somnifera to combat stress and treat male infertility. Normozoospermic but infertile individuals (N = 60), further categorized into three groups: normozoospermic heavy smokers (N = 20), normozoospermics under psychological stress (N = 20) and normozoospermics with infertility of unknown etiology (N = 20) were selected.The subjects were given root powder of W. somnifera at a rate of 5 g/day for 3 months. Measuring 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 also resulted in pregnancy in the partners of 14% of the patients.[4][10]

2. 8-week, randomized, prospective, double-blind, placebo-controlled clinical study, young male subjects (18–50 years old) were asked to consume 300 mg of ashwagandha root extract twice daily, while the control group consumed starch placebos. After 8 weeks, muscle strength was evaluated using the 1-RM load for the bench press and leg extension exercises. Muscle recovery was evaluated by using serum creatine kinase level as a marker of muscle injury from the effects of exercise. Study concluded that ashwagandha supplementation significantly increases muscle mass and strength and suggests that the supplementation might be useful in conjunction with a resistance training program.[11]
3. *This* study evaluated the cytotoxic effect of *Withania* root extract on human malignant melanoma A375 cells. The crude extract of *Withania* was tested for cytotoxicity against A375 cells by MTT assay. Cell morphology of treated A375 cells was visualized through phase contrast as well as fluorescence microscopy. Agarose gel electrophoresis was used to check DNA fragmentation of the crude extract treated cells. Crude extract of *Withania* root has the potency to reduce viable cell count in dose as well as time dependent manner. Morphological change of the A375 cells was also observed in treated groups in comparison to untreated or vehicle treated control. Apoptotic body and nuclear blebbing were observed in DAPI stained treated cells under fluorescence microscope. A ladder of fragmented DNA was noticed in treated cells. Thus, it reported that the crude water extract of *Withania somnifera* has potent cytotoxic effect on human malignant melanoma A375 cells.[2]

Special Precautions & Warnings:[12]

Pregnancy and breast-feeding: It is likely unsafe during pregnancy. There is some evidence that ashwagandha might cause miscarriages.

Diabetes: Ashwagandha might lower blood sugar levels. This could interfere with medications used for diabetes and cause blood sugar levels to go to low

High or low blood pressure: Ashwagandha might decrease blood pressure. This could cause blood pressure to go to low in people with low blood pressure

Stomach ulcers: Ashwagandha can irritate the gastrointestinal (GI) tract. It is therefore recommended to avoid Ashwagandha if one has stomach ulcer.

Auto-immune diseases such as multiple sclerosis (MS), lupus (systemic lupus erythematosus, SLE),

rheumatoid arthritis (RA), or other conditions: Ashwagandha might cause the immune system to become more active, and this could increase the symptoms of auto-immune diseases.

Surgery: Ashwagandha may slow down the central nervous system. Anesthesia and other medications during and after surgery might increase this effect.

Thyroid disorders: Ashwagandha might also increase thyroid hormone levels.

INTERACTION WITH MEDICATIONS:[12]

- **Medications that decrease the immune system (Immunosuppressants) interacts with Ashwagandha**

  Ashwagandha seems to increase the immune system. Taking ashwagandha along with medications that decrease the immune system might decrease the effectiveness of medications that decrease the immune system. Medications that decrease the immune system include azathioprine (Imuran), basiliximab (Simulect), cyclosporine (Neoral, Sandimmune), daclizumab (Zenapax), muromonab-CD3 (OKT3, Orthoclone OKT3), mycophenolate (CellCept), tacrolimus (FK506, Prograf), sirolimus (Rapamune), prednisone (Deltasone, Orasone), corticosteroids (glucocorticoids) and others.

- **Sedative medications (CNS depressants), (Benzodiazepines) interacts with Ashwagandha**

Ashwagandha might cause sleepiness and drowsiness. Some sedative medications include clonazepam (Klonopin), lorazepam (Ativan), phenobarbital (Donnatal), zolpidem (Ambien), diazepam (Valium), lorazepam (Ativan), and others

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