

# Withania somnifera

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*Withania somnifera*, also known as **Ashwagandha**, **Indian ginseng**, **Winter cherry**, **Ajagandha**, **Kanaje Hindi**, **Amukkuram** in Malayalam and **Samm Al Ferakh**, is a plant in *Solanaceae* or nightshade family.

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## Description

It grows as a stout shrub that reaches a height of 170 cm (5.6 ft). Like the tomato which belongs to the same family, it bears yellow flowers and red fruit, though its fruit is berry-like in size and shape. Ashwagandha grows prolifically in India, Nepal, Pakistan, Sri Lanka and Bangladesh. It is commercially cultivated in Madhya Pradesh (a state in India).

## Medicinal use

In Ayurveda ashwagandha is considered a rasayana herb. This herb is also considered an adaptogen which is an herb that works to normalize physiological function, working on the HPA axis and the neuroendocrine system.<sup>[*citation needed*]</sup> In Ayurveda, the fresh roots are sometimes boiled in milk, prior to drying, in order to leach out undesirable constituents. The berries are used as a substitute for rennet, to coagulate milk in cheese making.

*Ashwagandha* in Sanskrit means "horse's smell," probably originating from the odor of its root which resembles that of sweaty horse. In Tamil, it is called *Amukkrang Kilangu* and is used in several medicines.

The species name *somnifera* means "sleep-inducing" in Latin, indicating that to it are attributed sedating properties, but it has been also used for sexual vitality and as an adaptogen. Some herbalists refer to

### Withania somnifera L. Dunal



Ashvagandha plant at Talkatora garden, Delhi

#### Scientific classification

Kingdom: Plantae  
 Subkingdom: Tracheobionta  
 Division: Magnoliophyta  
 Class: Magnoliopsida  
 Subclass: Asteridae  
 Order: Solanales  
 Family: Solanaceae  
 Genus: *Withania*  
 Species: ***W. somnifera***

#### Binomial name

***Withania somnifera***  
 (L.) Dunal<sup>[1]</sup>

#### Synonyms

*Physalis somnifera*

ashwagandha as Indian ginseng, since it is used in ayurvedic medicine in a way similar to that ginseng is used in traditional Chinese medicine.

Seven American and four Japanese firms have filed for grant of patents on formulations containing extracts of the herb Ashwagandha. Fruits, leaves and seeds of the Indian medicinal plant withania somnifera have been traditionally used for the Ayurvedic system as aphrodisiacs, diuretics and for treating memory loss. The Japanese patent applications are related to the use of the herb as a skin ointment and for promoting reproductive fertility. The U.S based company Natreon has also obtained a patent for an Ashwagandha extract.

Another US establishment, the New England Deaconess Hospital, has taken a patent on an Ashwagandha formulation claimed to alleviate symptoms associated with arthritis. The product called "ashwagandha oil" is a combination of ashwagandha with almond oil and rose water designed to be used as a facial toner, and should not be consumed orally.

## Active constituents

The main constituents of *ashwagandha* are alkaloids and steroidal lactones. Among the various alkaloids, withanine is the main constituent. The other alkaloids are somniferine, somnine, somniferinine, withananine, pseudo-withanine, tropine, pseudo-tropine, cuscohygrine, anferine and anhydrine. Two acyl steryl glucoside viz. sitoindoside VII and sitoindoside VIII have been isolated from root. The leaves contain steroidal lactones, which are commonly called withanolides. The withanolides have C28 steroidal nucleus with C9 side chain, having six membered lactone ring.

## Pharmacological effects

Ashwagandha is reported to have anti-carcinogenic effects in animal and cell cultures by decreasing the expression of nuclear factor-kappaB, suppressing intercellular tumor necrosis factor, and potentiating apoptotic signalling in cancerous cell lines.<sup>[2]</sup>

## Pathology

Withania somnifera is prone to several pests and diseases. Leaf spot disease of Withania somnifera caused by *Alternaria alternata* is the most prevalent disease. It is most severe in Indian plains of Punjab, Hariyana and Himachal Pradesh. Dr. Pratap Kumar Pati research group from Guru Nanak Dev University India, recently reported in an article of Indian journal of microbiology, on the biodeterioration of its pharmacologically active components during leaf spot disease.<sup>[3]</sup>

## Side effects

There are few listed side effects for Withania Somnifera in humans, but a study on its effects on rats found unfavorable issues in their hearts and adrenal glands in extremely high dosages taken for a duration of 180 days.<sup>[4]</sup>

Withania somnifera stimulates the thyroid leading to thyreotoxicosis in some humans<sup>[5]</sup> and in mice.<sup>[6][7]</sup>

## Other species

There are over 20 other species of the *Withania* genus that occur in the dry parts of India, North Africa, Middle East, and the Mediterranean. These include *Withania coagulens* and *Withania simonii*, the roots of which are sometimes used interchangeably with those of *Withania somnifera*.

*Withania somnifera* itself has been extensively domesticated from the wild form. In India, at least five different cultivars have been developed for increased root size and adaptation to different climates.

## Subspecies

*Withania somnifera* Dunal and *Withania ashwagandha* Kaul are the two sub-species of the plant.

## Research

Professor Kailas Nath Kaul was the pioneer of modern scientific research on *Withania somnifera*. (Kaul K. N. 1956. The origin, distribution & cultivation of Ashwagandha the so called *Withania somnifera* of Indian literature. Symposium on the utilisation of Indian Medicinal Plants; Lucknow CSIR.pp.07-08.) The sub-species *Withania ashwagandha* Kaul has been named after him.

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