

## The Characteristics, Benefits and Application of Ashwagandha in the West



Image 1.

Tanya Gardner  
AHP Level 2  
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## INTRODUCTION

Ashwagandha (*Latin: Withania somnifera*), also known as winter cherry or Indian ginseng is both a tonic and a sedative due to its adaptogenic properties <sup>1</sup>. *Withania* refers to the plants primary extract and *somnifera* literally means “sleep-inducing” <sup>2</sup>. The name ashwagandha is derived because of two reasons – the roots of the herb smell like a horse and, there is a commonly held belief that a person consuming extracts of the herb may develop the strength and vitality similar to that of a horse <sup>3</sup>. Ashwagandha is also known as the “Sattvic Kapha Rasayana” <sup>4</sup>. “Rasayana” is Sanskrit and literally means “path” (ayana) of the “rasa” (fluid or juice) <sup>5</sup>. According to Sushruta, rasayanas are the substances that slow the ageing process, increase longevity and increase strength, both mental and physical <sup>6</sup>.

In the Astanga Hridayam, Vagabhata opens the chapter on rasayanas with these words:

*“Long life (good), memory (great), intelligence, (perfect) health, youthfulness, (bright) complexion and colour, (bold) voice and magnanimity, increase of strength of the body and the sense organs, perfection in speech, sexual prowess and brilliance – are all obtained from rasayan therapy. It is the best means of keeping the rasa and other dhatus in excellent condition.”* <sup>7</sup>

*Rasayana Chikitsa* (rejuvenation treatment) is a unique branch of Ayurveda. According to the Caraka Samhita, the improved quality of the rasa and other “dhatus” (tissues) supports longevity, strength, and good “ojas” <sup>8</sup>. Ojas is the most subtle level of the physical body and is responsible for one’s overall strength, health and well-being <sup>9</sup>. One of the unique features of the rasayana ashwagandha is its ability to enhance the ojas. According to Caraka: “When the ojas is diminished, the person is fearful, weak, always worried, having disorders of the sense organs, deranged lustre and mental ability, rough and emaciated.” <sup>10</sup>

Used in India for thousands of years as a common home remedy, ashwagandha is one of the most versatile medicinal plants in Ayurvedic Medicine with a wide spectrum of actions and applications. The Caraka Samhita states ashwagandha is specific to the mamsa dhatus as it simultaneously reduces inflammation and tonifies muscle <sup>11</sup>. It was primarily used for emaciated children and to strengthen the elderly. This was due to its rejuvenative powers and the early healers observations that it increased the dhatus and the body weight. Stronger, higher quality dhatus also supported the srotas and allowed for any blockages to be removed <sup>12</sup>. It was observed to reduce tremors in the hands and limbs. Atriya, who lived around 1000bc

wrote of its numerous uses and Charaka (100bc) prescribed it for hiccups and female disorders<sup>13</sup>.

Today, ashwagandha is the most often used medicinal plant in Ayurveda<sup>14</sup> and one of the most studied rasayana plants with hundreds of studies conducted for different therapeutic indications<sup>15</sup>. These therapeutic indications and ashwagandha's associated healing properties will be described in this paper.

## THE PLANT



Image 2.  
The Leaf



Image 3.  
The Fruit



Image 4.  
The Root

Ashwagandha is part of the Solanaceae, or nightshade, family (which also includes tomato, potato, eggplant, peppers) and is found in India as well as Africa and the Mediterranean. Its most identifiable feature is its small red berry, which looks similar to a cherry tomato. It is a woody shrub which grows to be about 2 feet in height<sup>16</sup>. The branches form a star pattern and are covered in tomentose (hairs). The flowers are small and green the fruit is orange red<sup>17</sup>. Ashwagandha is treated as an annual in cultivation. Its seeds are sown at the beginning of the monsoon season and harvested 5 months later. Ashwagandha will also grow well in drought conditions<sup>18</sup>. Ashwagandha is most commonly administered as a "churna", a fine sieved powder that can be mixed with ghee, honey, milk or water<sup>19</sup>.

Ashwagandha has a bitter, astringent and sweet rasa, a heating virya and a sweet vipaka. It is heavy, unctuous and vata- and kapha-reducing. It is increasing for pitta and ama.

The dhatus benefiting from its use are rakta, mamsa, medas, asthi, majja and shukra. Primary srotas are shukhravaha, majjavaha, and pranavaha srotas<sup>20</sup>.

Though all parts of the plant are used, it is the root that provides the most pharmacological effect as the major extract - withanoloids (combination of steroidal alkaloids and lactones) are contained therein. The primary withanoloids are withaferin A and withanolide D which have been studied in the areas of oncology, immunology, neuroregeneration, and neurodegeneration. Withanolides act upon hormones as a regulator. Researchers are studying under the premise that if there is a particular hormone in excess, the withanolides will occupy cell receptor sites so that the excess hormone cannot attach and have an effect. Depending on the amount of the excess hormone, the withanolides behave accordingly<sup>21, 22</sup>.

## **DOSAGE**

There is no standard dose for administration of ashwaganda although 3-6 grams daily of the powder formula is cited most commonly<sup>23, 24 25</sup> and seems to be provide the maximum benefit when fresh ashwagandha powder is used<sup>26</sup>. In addition to the powder form, mild decoctions, alcoholic extracts, mixed with ghee or honey or as a topical oil are also effective formulations.

## **SAFETY PROFILE**

Systematic studies on the safety and toxicity of ashwagandha have not been reported. Ashwagandha is generally believed to be safe though various sources cite precautions: EBSCO, the online database, recommends it should not be used by pregnant or nursing women, young children, or those with severe kidney or liver disease. In addition, because it has the potential (based on one study), to raise thyroid hormone levels<sup>27</sup>, it should not be used by people with hyperthyroidism. EBSCO also cautions as ashwagandha is a sedative, interactions with sedative drugs may occur<sup>28</sup>.

Pole reports in his book that there are no known drug-herb interactions and advises to monitor blood glucose susceptible patients due to the plants hypoglycemic activity<sup>29</sup>. One monograph reports abortifacient properties of ashwagandha so use during pregnancy is to be avoided as is alcohol, sedatives and anxiolytics<sup>30</sup>. WebMD online lists the most precautions

adding cautions for those with stomach ulcers, preparing for surgery, thyroid disorder, and autoimmune diseases such as multiple sclerosis, lupus and rheumatoid arthritis<sup>31</sup>.

Published studies reporting no untoward effects include 18 healthy volunteers, ages 18-30 receiving escalating daily doses (750mg, 1000mg, 1250mg, respectively) of *Withania somnifera* capsules for 30 days<sup>32</sup>. Another study with 64 human subjects with a history of chronic stressed were randomized to either placebo or treatment groups. The treatment group received 300mg high-concentration full spectrum root extract for 60 days with no adverse events reported<sup>33</sup>.

Finally, in Lakshmi-Chandra et al's review paper "Scientific Basis for Therapeutic Use of *Withania somnifera*", the doses reaching acute toxicity levels in rats is approximately 450/mg/kg and in albino mice, 1750mg of aqueous solution and 1500mg of IP injection<sup>34</sup>.

## **BENEFITS OF ASHWAGANDHA**

The documented potential benefits of the use of ashwagandha is impressive. A simple web search of "benefits of ashwagandha" results in many published studies and sites detailing these benefits. *Note: Care should be taken when reviewing website articles that do not provide references to the published research. In addition, within the published literature, a number of published studies report inconclusive findings and make recommendations for further research.*

Review of the literature reveals ashwagandha falling into the following drug categories:

**Table 1: List of drug categories within which Ashwagandha is classified:**

Adaptogen	Anti-oxidant	Diuretic	Nervine tonic
Anthelmintic	Aphrodisiac	Expectorant	Rasayana/Rejuvenative Tonic
Anti-inflammatory	Astringent	Nervine sedative	Reproductive Tonic
			Shukrala

Specifically, ashwagandha is documented to address the following imbalances<sup>35-47</sup>:

**Table 2: List of imbalances treatable with Ashwagandha**

Acne	Constipation	Hiccups	Painful swelling
ADHD	Cough	High cholesterol	Parkinson's disease
Allergies	Dementia	Huntington's disease	Sperm count and motility
Alzheimer's disease	Depression	Hyperglycemia	Stress
Amenorrhoea	Diabetes	Hypertension	Stroke
Anxiety	Dysmenorrhea	Impotence	Thyroid disorders
Arthritis (OA and RA)	Flatulence	Infertility	Tuberculosis
Asthma	Goiter	Influenza	Tumors
Bronchitis	Dementia	Insomnia	Ulcers
Cancer	Depression	Leukorrhea	Uterine fibroids
Carbuncles	Diabetes	Lung adenoma	Uterine spasms
Chronic Fatigue	Dysmenorrhea	Low energy	Vitiligo
Colic	Epilepsy	Memory Loss	Worms
Congestion	Goiter	Multiple Sclerosis	
Conjunctivitis	Hemorrhoids	Obesity	

In his book, **“Ayurvedic Medicine: The Principles of Traditional Practice”**,

Sebastian Pole summarizes many of ashwagandha's benefits:

“...stabilizing, good for insomnia, erratic digestion, constipation and anxiety. It is calming while strengthening, giving energy while also settling the nervous system. Can be taken morning and evening, great for enhancing stability and strength in yoga practice as well.”<sup>48</sup>

Narendra Singh et al's overview in the African Journal of Alternative Complementary Medicine mentions many of the known benefits in a single paragraph:

“[Ashwagandha] enhances the function of the brain and nervous system and improves the memory. It improves the function of the reproductive system promoting a healthy sexual and reproductive balance. Being a powerful adaptogen, it enhances the body's resilience to stress. Ashwagandha improves the body's defense against disease by improving the cell-mediated immunity. It also possesses potent antioxidant properties that help protect against cellular damage caused by free radicals.”<sup>49</sup>

Adaptogens are herbs that help in combating stress. Stress is a mental or emotional strain which, if regularly induced over time can lead to significant imbalance or disease. Adaptogens

also can improve the body's performance and endurance. A recent definition in the literature defines adaptogens as

“a class of metabolic regulators which increase the ability of an organism to adapt to and avoid damage from environmental factors....an adaptogen should: a) decrease stress-induced damage, b) be safe and produce a beneficial effect...c) be devoid of any negative effects such as withdrawal syndromes and d) not influence the normal body functions more than necessary<sup>50</sup>.

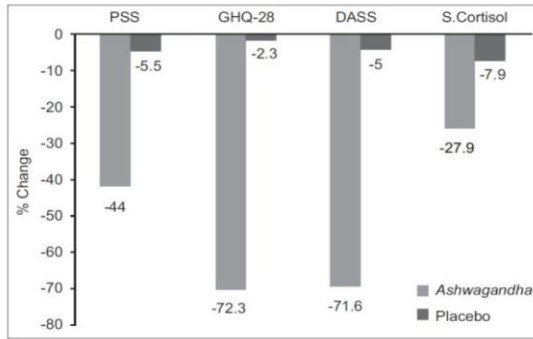
Ayurvedic classical texts, animal studies and clinical studies describe Ashwagandha as a safe and effective adaptogen possessing all of these characteristics. Modern day literature verifies what the ancient rishis already knew about the plant's healing properties. For example, a 2001 study conducted in rats (n = 18) divided them into three treatment groups – placebo, a water suspension of 360mg/kg, and an oral compound of 20mg/kg. The rats were placed in a cold environment and the time to return to normal body temperature was monitored. The rats given the oral compound returned to their normal body temperature 40 minutes faster than the water suspension group and 60 minutes faster than the placebo group<sup>51</sup>.

In another study, 64 human subjects with a history of chronic stress were enrolled into a study. At baseline the subjects' serum cortisol was measured and a standard set of stress-assessment questionnaires administered. All subjects had similar baselines questionnaire scores. Subjects were randomized to either the placebo control group or the study drug treatment group (300mg capsule of high concentration ashwagandha root) and required to take one capsule two times per day for a period of two months. At Day 60 the serum cortisol was again tested and three stress assessment questionnaires administered. The perceived stress scale (PSS) questionnaire showed a 5.5% reduction in score in the placebo compared to 44% in the ashwagandha treatment group. The results of the GHQ-28 general health questionnaire showed the ashwagandha treatment group have improved scores ranging from 58%-89% higher compared to the placebo arm. The Depression Anxiety Stress Score (DASS) results showed average reduction in depression, anxiety, and stress to be 72% decrease in the ashwagandha treatment group compared to only 4.5% average decrease in placebo.□

Finally, the serum cortisol levels, which were at similar levels in both groups at baseline, were very different at Day 60. The ashwagandha group demonstrated at 27.9% reduction in cortisol levels compared to just 7.9% in the placebo control group<sup>52</sup>. **Figure 1.** shows the comparative changes from baseline to Day 60 for both the questionnaires and the cortisol levels:



**Figure 1.** Percentage change from baseline in PSS, GHQ-28, DASS, Serum cortisol



More recently, adaptogens have started to be used in sports supplements to enhance physical fitness. A very recent study conducted in 57 healthy male volunteers with limited experience in strength training (age range 18-50) were randomized to either a control placebo group of 300mg daily starch capsule or to 300mg daily ashwagandha powder capsule. Subjects attended training sessions 3 days per week to perform weight lifting repetitions of both the upper and lower body. Muscle strength, muscle size, testosterone levels, recovery time and tolerability were monitored. In each area, the ashwagandha treatment group showed significant improvement with the exception of muscle strength in which the two groups remained equal. No side effects were reported in either group<sup>53</sup>.

## **SPECIFIC BENEFITS RELATED TO NEURODEGENERATIVE DISORDERS**

One growing area of focus in the therapeutic effects of ashwagandha is in the treatment neurodegenerative disorders such as dementia, multiple sclerosis, and Parkinson's, Alzheimer's, and Huntington's diseases. Research in humans is extremely limited but there is a wealth of published animal studies pointing to the neuroprotective and neuroregenerative properties of Ashwagandha. Hypotheses surrounding ashwagandha's potential to slow, halt or reverse the progression of neurodegenerative disorders are focused on withanolides found within the plant. This group of steroidal lactones are known to have neuron and brain regenerative properties. In neurodegenerative disorders the components of the nerve cells – axons, dendrites, and the pathways upon which they travel - are destroyed. This has a negative effect on abilities such as perception, memory, learning and reasoning<sup>54</sup>. Animal studies to date have shown that ashwagandha regenerates damaged neurons, reconstructs the nerve-signaling network<sup>55</sup>, and improves memory deficits<sup>56</sup>. The plant also re-grows dendrites<sup>57</sup> and therefore rebuilds brain tissue<sup>58, 59</sup>. Neuroprotective properties have shown marked improvements in motor skills, anatomical, and behavioral impairments<sup>60,61</sup>.

## **SUMMARY**

Ashwagandha traditionally was used as a rejuvenative tonic for both children and the elderly. It grows in various parts of the world and is readily available, easy to store, and easy to formulate. It is one of the most utilized plants in Ayurvedic medicine and the most studied rasayana. Ashwagandha is widely accepted to be safe though would benefit from further systematic research into the safety profile. It is best administered as a churna mixed with ghee, milk or honey but other formulations are also effective. Standard dosages vary with the most common being 1-2 grams, three times per day. Ashwagandha is formally classified as an adaptogen. The primary pharmacological effect is derived from the roots which contain withanoloids and are attributed with giving the plant its impressive versatility. It is known as the “Indian Ginseng” and may be widely applied to many disorders and imbalances. Most recently it has been studied in the areas of oncology, both for tumor reduction and as a tonic post-chemotherapy, and in the area of neurodegenerative disorders. Ashwagandha’s unique properties and the many animal studies performed to date point positively to the fact that it acts as both a neuro-protective agent and as a neuro-regenerator. Human studies in the therapeutic area of neurodegenerative disorders are very limited and further research is needed.

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**SOURCES OF IMAGES** accessed on 23 December 2015:

Image 1: <http://blog.tasmanhealth.co.nz/rejuvenating-benefits-ashwagandha-herb/>

Image 2:

[http://www.healingspiritsherbfarm.com/images/gallery/w500/1328192904\\_6706852731f2.jpg](http://www.healingspiritsherbfarm.com/images/gallery/w500/1328192904_6706852731f2.jpg)

Images 3 and 4: <http://www.pukkaherbs.com/pukka-planet/stories/plants/introducing-ashwagandha/>