



Witholytin® is the only USP verified, identity assured, scientifically researched ashwagandha extract, standardised to 1.5% total withanolides from the roots. Witholytin® is supported by recent scientific evidence demonstrating significant benefits for fatigue and stress.



PRODUCT PROFILE SHEET

About Ashwagandha

Ashwagandha, or *Withania somnifera* (WS), holds a special place in several traditional Ayurvedic preparations similar to ginseng in Traditional Chinese Medicine. It is also known as "Indian winter cherry" or "Indian ginseng". With various studies supporting multiple benefits, ashwagandha is known in Ayurveda as a natural adaptogen.

Roots or Leaves?... and the Adulteration Problem

Traditional literature frequently references **the root of the plant as the important part, medicinally**; thus root powders and extracts are often found commercially. Unfortunately, some of these traditional applications are at relatively high daily doses, and information from historic records indicates that these high dosages may cause irritation to mucous and serous membranes, resulting in gastrointestinal upset, diarrhoea, and vomiting. To reduce these side effects resulting from high dosing, ashwagandha extracts containing concentrated levels of bioactives have found their way into the global marketplace.²

With the growing market demand, increased concern surrounding *Withania somnifera* in relation to the likelihood for adulteration has come to the forefront. The key bioactives, **withanolides**, are present in all parts of the ashwagandha plant, and may be found in higher concentrations in the leaves and aerial parts. Ashwagandha leaves contain the same primary active compounds, withaferin A and withanolides, as the roots, but at a lower market price and thus tend to have associated adulteration concerns.

Witholytin® is the World's first Alkemist Assured™ Ashwagandha, ensuring trust and good quality. Our partners Verdure Sciences® are dedicated to maintaining strict quality control and assured standards throughout the manufacturing of Witholytin®. They prioritise supply chain management, sustainability, traceability, and complete transparency when it comes to disclosing all plant parts and bioactives.

About Withanolides

The distinctive earthy odour and flavour of ashwagandha is due to the presence of certain steroidal lactones or withanolides. Withanolides are the major constituents of ashwagandha. There are about 40 withanolides in *Withania somnifera*, each with a different neurochemical effect on the body. Theoretically, the withanolides serve as important hormone precursors, which may be convertible into human physiologic hormones as needed^{1,6}. Further, withanolides have been utilised as the "marker constituents" in pharmacopoeial monographs including United States Pharmacopoeia (USP), British Pharmacopoeia (BP), Indian Pharmacopoeia (IP), and The Ayurvedic Pharmacopoeia of India (API). It is thought that these withanolides are synthesised in the leaves and transported to the roots.²

Product Advantages

- ✓ **The only Alkemist Assured™ Ashwagandha**
verified botanical identity and quality
- ✓ **The only USP Verified Ashwagandha**
standardisation and transparency can be verified at anytime by third-party laboratories
- ✓ **Full Traceability**
- ✓ **Standardised to 1.5% Total Withanolides by USP**
- ✓ **Produced only from the Roots**
- ✓ **Clinical Research**
supporting Fatigue and Stress, Muscle Health and Mitochondrial Health
- ✓ **Traditional History as Natural Adaptogen**
- ✓ **Sustainable**
- ✓ **Suitable for Vegetarians and Vegans**
- ✓ **Kosher & Halal Certified**

Research

Witholytin® Research on Fatigue and Stress

A new published human clinical study (2023) evaluated the safety of Witholytin® and impacts to perceived fatigue and stress and in 111 men and women (40-75yrs) experiencing low energy and moderate-to-high perceived stress over 12-weeks. The study used a daily dose of 200mg Witholytin® twice a day.³

Results showed that Witholytin® was associated with a statistically significant 45.81% reduction in the Chalder Fatigue Scale (CFS) total score and a 38.59% reduction in stress levels based on the Perceived Stress Scale compared to baseline at 12-weeks. The study concluded that Witholytin® may support an adaptogenic approach to combat fatigue, regain vitality, and promote homeostasis and balance.



Furthermore, researchers from this study claimed that Witholytin[®] exhibited substantial energy bolstering effects in overweight middle-to-older age adults who are experiencing high stress and fatigue.³

A sub-analysis was performed to examine hormone biomarkers in both men and women.³ In the men taking Witholytin[®] ashwagandha, there was a significant 12.87% increase in blood concentrations of free testosterone ($p = 0.048$) and luteinizing hormone ($p = 0.002$) compared to the placebo group.³

Based on these results, a further examination into populations that may benefit from ashwagandha supplementation will be important, as its stress-reducing effects may differ based on age, sex, BMI status, and other factors.

Witholytin[®] Research on Mitochondrial Health

Recently published (April 2025) in-vitro and in-vivo data⁴ indicated that Witholytin[®] **robustly influenced mitochondria in cortical neurons, contributing to stress adaptation and neuroprotection** via Brain Derived Neurotrophic Factor (BDNF), the protein that provides trophic support for neurons and encourages the growth and differentiation of new neurons, and Sirtuin 1 (SIRT1) signalling. SIRT1 affects neuronal morphology during development and is important in maintaining metabolic and circadian homeostasis during ageing.

These initial findings may require further investigation, but they suggest that Witholytin[®] phytoactives may enhance **mitochondrial biogenesis and neuroenergetics** (the production, distribution, and utilization of energy within the brain) in cortical circuits. This raises the possibility that Witholytin[®] may potentially offer benefits ranging from enhancing stress adaptation to aiding neurodegenerative disorders.⁴

Witholytin[®] Research on Muscle Health

Sarcopenia is associated with chronic inflammation, a sedentary lifestyle, and ageing. However, to the best of our knowledge, there is no drug, which is safe and effective for long-term use.

A double-blind, randomized, placebo-controlled clinical study⁵ in 2024 evaluated the effects of Witholytin[®] on muscle health in healthy volunteers. Participants received either 250 mg of Witholytin[®] or a placebo twice daily for 60 days. Physical performance, biomarkers, body composition, reaction time, hemogram, and organ function were assessed at baseline, day 30, and day 60.

Results showed that the Witholytin[®] group had significant improvements ($p < 0.05$) in total distance travelled and average speed on a bicycle ergometer from baseline (V3) to the last visit (V7), compared to the placebo group. **Hand-grip strength, back-leg press, skeletal muscle mass, and V02 max increased** from V3 to V7, while **inflammatory markers** (hs-C-reactive protein, IL-6, TNF-alpha) and **myostatin decreased**. Witholytin[®] was found to be safe for healthy volunteers based on hematological investigations, organ function tests, and a reaction time assessment to evaluate alertness.⁵

The study concluded that Witholytin[®] supplementation is **safe and effective in enhancing physical performance and strengthening muscle mass**, indicating its potential as a supportive strategy for **sarcopenia**.



Additional Research on Ashwagandha

In a systematic review, 41 human trials were identified examining the effects of ashwagandha on health and physical/cognitive performance. These included stress, anxiety, sexual function & fertility, athletic performance, fatigue, thyroid function, schizophrenia, OCD, insomnia, general wellbeing, hypercholesterolemia & tuberculosis.⁶ Overall, the strongest evidence for therapeutic efficacy of ashwagandha is the alleviation of stress and anxiety symptoms. The results from this systematic review suggest ashwagandha has a potentially large array of therapeutic applications.⁶

Ashwagandha has been a highly sought-after herb for numerous purposes, including its potential to enhance energy, memory, and strength. It is also known for its potent antioxidant properties and its ability to boost the body's defences by enhancing cell-mediated immunity.⁷ Scientific literature presents experimental studies conducted under acute stress conditions, which have consistently shown significant stress-reducing effects.^{8,9}

In a study, naturopathic treatment including Withania somnifera appeared to be safe and effective, with benefits over standardised psychotherapy in the treatment of mild to severe generalised anxiety in the Canadian post worker population.¹⁰

In addition, ashwagandha has several properties generally associated with adaptogens¹¹, including immunomodulatory¹², cognition-promoting, anti-inflammatory, antioxidant, radio sensitising, and mood stabilising behavioural effects in experimental models.



Quality Assurance

Analytical Methods for the Determination of Withanolides

It is important to highlight that due to the reported cytotoxicity at higher doses and safety in normal cells at lower doses, developing solutions with low withaferin A content and disclosing the methodology and plant part used are critical factors in the selection of the right ashwagandha extract.

Although Witholytin® is tested according the USP methodology, Verdure Sciences®, has developed and validated a **UHPLC–PDA** method for the simultaneous estimation of 11 withanolides (see table).¹³ Analytical methods, such as USP and Verdure's UHPLC–PDA use multiple reference standards for the quantitative determination of the withanolide constituents.

Unfortunately, the vast majority of ashwagandha extract manufactured across the world estimate the withanolide content by in-house HPLC methods without disclosing all the identified bioactive withanolides used when reporting total content, which is insufficient and may create confusion. **Witholytin® is manufactured ensuring botanical identity and quality.**

Table 1

UHPLC–PDA (Verdure Sciences) and USP methods

	Withanolides	USP method	Verdure method
1	withanoside V	Y	Y
2	withanoside IV	Y	Y
3	withanone	Y	Y
4	withanolide B	Y	Y
5	withanolide A	Y	Y
6	withaferin A	Y	Y
7	12-deoxywithastramonolide	Y	Y
8	withanoside VII	N	Y
9	viscosalactone B	N	Y
10	dihydrowithaferin A	N	Y
11	27-hydroxywithanone	N	Y
12	withanoside VI	Y	N

Sustainability



Verdure Sciences® works with associations, companies, organisations, and people around the globe to promote public awareness of initiatives and strategies of sustainable, traceable and certifiable practices. This integration, Verdugration®, is their commitment to these responsibilities.

Ingredients with the Verdugration® logo aim to achieve the high level of sustainable, traceable, and philanthropic efforts to provide not only high quality ingredients, but also a system rooted in responsible practices and care for these ingredients, the communities they operate in and our environment.

Product Safety

In human clinical trials, Witholytin® Ashwagandha supplementation was well tolerated with no major self-reported adverse reactions.^{3,5}

In addition to this, Ashwagandha has a long history of use in Ayurveda. To the best of our knowledge, the findings from studies published to date suggest that ashwagandha is safe.



Product Range

Ingredient	Active Content	Grade	Mesh Size
Witholytin®	Min 1.5% Withanolides	Powder	NLT 90% thru 80 mesh

Product Pack Size

Witholytin® is packaged in bags of 20kg.

Product Applications

Witholytin® can be used in capsules, tablets, pouches, sachets and powder blends.

Product Dosage

Suggested daily dose 400 mg to 600 mg per day.

Botanical Claims

The European List of on-hold botanical claims refers to ashwagandha for its adaptogenic properties. In the European Union (EU), ashwagandha is not subject to the Novel Food Regulation because it was on the market as a food or food ingredient and consumed to a significant degree before May 15, 1997.



About



With headquarters in Noblesville (IN) USA, Verdure Sciences is a manufacturer of innovative nutritional botanical ingredients with university-based, cutting-edge research.

References

1. *Withania somnifera*. *Altern Med Rev* 9: 211–214.
2. Engels G et al. (2013) Herb Profile: Ashwagandha *Withania somnifera* family: Solanaceae. *HerbalGram*.
3. Smith SJ et al. (2023) Exploring the efficacy and safety of a novel standardized ashwagandha (*Withania somnifera*) root extract (Witholytin[®]) in adults experiencing high stress and fatigue in a randomized, double-blind, placebo-controlled trial. doi: 10.1177/02698811231200023
4. E. Fanibunda et al. (2025) *Withania somnifera* Regulates Mitochondrial Biogenesis and Energetics in Rat Cortical Neurons: Role of BDNF and SIRT1. doi.org/10.1007/s12035-025-04920-7
5. Raut et al. (2024) Evaluation of *Withania somnifera* (L.) Dunal (Ashwagandha) on Physical Performance, Biomarkers of Inflammation, and Muscle Status in Healthy Volunteers: A Randomized, Double-Blind, Placebo-Controlled Study. doi:10.7759/cureus.68940
6. Lopresti & Smith: Ashwagandha (*Withania somnifera*) for the treatment and enhancement of mental and physical conditions: A systematic review of human trials. doi.org/10.1016/j.hermed.2021.100434.
7. Mishra LC, Singh BB, Dagenais S (2000) Scientific basis for the therapeutic use of *Withania somnifera* (ashwagandha): a review. *Altern Med Rev* 5: 334–346.
8. Singh N et al. An overview on ashwagandha: A rasayana (rejuvenator) or Ayurveda. *Afr J Trad Comp Alter Med*. 2011; 8(5 Suppl): 208–213. doi: 10.4314/ajtcam.v8i5S.9
9. Bhattacharya et al. Antistress activities of sitoindosides VII and VIII, new acyl sterol glucosides from *Withania somnifera*. *Phytother Res*. 1987;1: 32–33.
10. Cooley et al. Naturopathic Care for Anxiety: A Randomized Controlled Trial. *PLoS ONE*, 2009, volume 4, issue 8.
11. Wagner et al. *Plant adaptogens*. 1994. 1: 63–78.
12. Ghosal et al. Immunomodulatory and CNS effects of sitoindosides IX and X, two new glycowithanolides from *Withania somnifera*. *Phytother Res*. 1989. 2: 201–206.
13. Girme A et al. Investigating 11 withanosides and withanolides by UHPLC–PDA and mass fragmentation studies from ashwagandha (*Withania somnifera*). *ACS Omega* 2020. 5: 27933–43. doi: 10.1021/acsomega.0c03266.