

## Ashwagandha Extract 450 mg

### TECHNICAL SUMMARY

Ashwagandha (*Withania somnifera*) is an herb used extensively in traditional Indian Ayurveda. ashwagandha's historic use as a general tonic is primarily due to its adaptogenic properties, which help the body adapt to temporary physical and emotional stress.\* Modern scientific data suggest that ashwagandha may also support healthy immune system function.\*

**Structure formula:** Among the more than 35 chemical constituents isolated in ashwagandha root, withanolides, a group of steroidal lactones, are believed to be the main bioactive compounds.

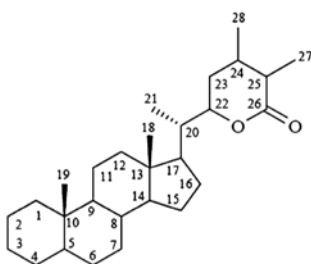


Figure 1: Withanolide skeleton.

**Chemical name:** The basic skeleton of withanolides is 22-hydroxyergostan-26-oic acid-26,22-lactone. Withaferin A (4 $\beta$ , 27-dihydroxyl-1-oxo-5 $\beta$ , 6 $\beta$ -epoxywitha-2-24-dienolide) was the first member of this group of compounds to be isolated.

**Allergen and Additive Disclosure:** Not manufactured with yeast, wheat, gluten, soy, milk, egg, fish, shellfish or tree nut ingredients. Produced in a GMP facility that processes other ingredients containing these allergens.

**Delivery Form:** Vegetable capsules

### ROLE AS NUTRIENT/FUNCTION

Because of the complex makeup of bioactive compounds found in ashwagandha roots, their physiological functions have not been completely elucidated at this time. Withanolides have been extensively studied and laboratory data suggest that they are involved in some of the following functional properties of ashwagandha:

- **CNS:** Data from laboratory experiment suggest that ashwagandha interact with the GABA<sub>A</sub> receptor system as well as many other neurologic pathways.\*
- **Immune support:** Withanolides are known to interfere with the nuclear factor-kappaB system and it may partially explain the effect of ashwagandha on the immune system.\* Other data suggest that withanolides are involved in the regulation of the immune response favoring a specific pathway that increase macrophage functions.\*
- **Oxidative damage:** in studies on model animals ashwagandha was able to limit lipid peroxidation, superoxide dismutase activity and to enhance the activity of catalase and glutathione peroxidase.

## Supplement Facts

Serving Size 1 Veg Capsule

### Amount Per Serving

Ashwagandha Extract	450 mg*
( <i>Withania somnifera</i> ) (Root)	
(min. 2.5% Total Withanolides - 11 mg)	

\* Daily Value not established.

Other ingredients: Hypromellose (cellulose capsule), Rice Flour and Magnesium Stearate (vegetable source).

- **Ayurvedic Adaptogen\***
- **Immune System Support\***

**SUGGESTED USAGE:** Take 1 capsule 2 to 3 times daily, or as directed by your healthcare practitioner.

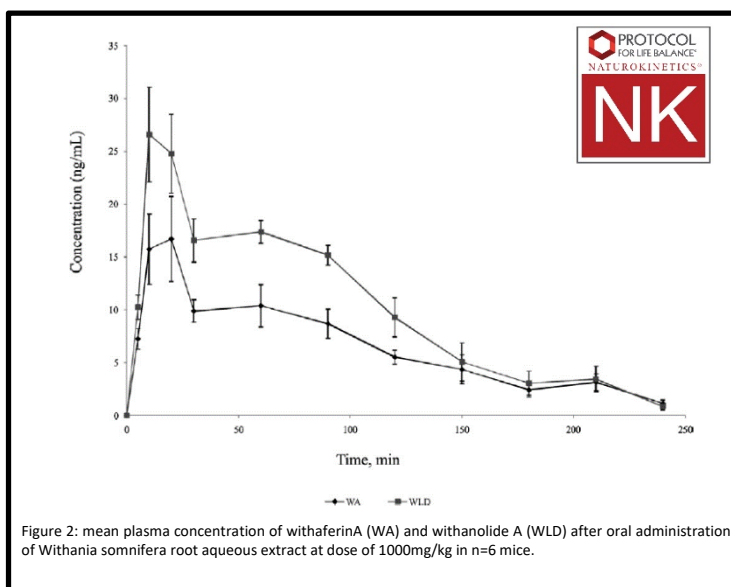
These results are preliminary and only account for part of ashwagandha's biological activity.

### NATUROKINETICS®

**Liberation:** These Ashwagandha vegetable capsules disintegrate within 60 minutes in a USP water disintegration test.

Absorption, distribution, metabolism and elimination of ashwagandha has not been studied in humans, however data from model animals helps us extrapolate Naturokinetics® of Ashwagandha.

**Absorption:** Data from model animal data suggest a rapid absorption of withanolides. In a study performed on mice receiving 1000mg/kg of an ashwagandha root water extract, T<sub>max</sub> for withaferin A and withanolide A were respectively 10 and 20 minutes. Another study using a different model suggest that after oral absorption ashwagandha is well absorbed.



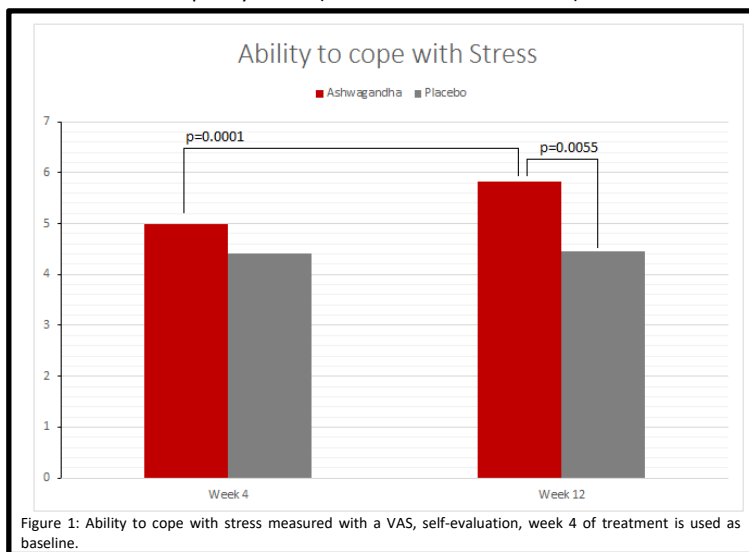
**Distribution:** The distribution of ashwagandha's bioactive compounds has not been evaluated. However studies performed on model animals suggest that some of these bioactive compounds are able to pass the blood brain barrier since physiologic changes are observed in the brains of animals ingesting ashwagandha extracts.

**Metabolism:** Information regarding ashwagandha's metabolism in the body is not yet available.

**Elimination:** Data from model animal suggest that the clearance from plasma is rapid.

### CLINICAL VALIDATION

- In a 12-week randomized, placebo-controlled clinical study on adult volunteers receiving a standardized ashwagandha extract at a daily dose of 600 mg (300 mg twice a day), authors observed a significant improvement in fatigue (assessed with a self-evaluation fatigue questionnaire) in the ashwagandha group compared to baseline and placebo.\* In this study, the ability of cope with stress was evaluated as a secondary endpoint using a 7-point visual analogue scale; volunteers in the ashwagandha group, described a significant improvement in their ability to cope with stress versus baseline and versus placebo. Volunteers also showed improvements in their self-evaluation of quality of life (measured with SF-36 test).\*



### SAFETY INFORMATION

**Tolerability:** This product may cause digestive upset in some sensitive individuals.

**Caution:** Thyroid function should be monitored at inception of supplementation with ashwagandha in individuals with known thyroid function disorder.

**Contraindications:** Pregnant and nursing women.

### INTERACTIONS

**Drug Interactions:** Theoretically, ashwagandha may interfere with barbiturates and anxiolytics including benzodiazepines. Caution is

recommended when combining these medications and ashwagandha while driving or operating machinery. Ashwagandha may interfere with thyroid hormone medication, caution is advised.

**Supplement Interactions:** Theoretically, ashwagandha may potentiate supplements with sedative effects.

**Interaction with Lab Tests:** Some compounds found in ashwagandha may interfere with essays used to measure digoxin blood levels. This may results in falsely elevated digoxin levels, some test methods seem more affected than others.

Ashwagandha might interfere with thyroid function testing by decreasing TSH, and increasing T3 and T4 values.

### STORAGE

Store at ambient conditions in tightly sealed container.