



HerbClip™

Christina Chase, MS, RD
Heather S Oliff, PhD

Mariann Garner-Wizard
Risa N Schulman, PhD

Diane Graves, MPH, RD
Densie Webb, PhD

Executive Editor Mark Blumenthal **Consulting Editor** Don Brown, N.D. **Managing Editor** Lori Glenn
Funding/Administration Wayne Silverman, PhD **Production** George Solis/Kathleen Coyne

**FILE: ■Ashwagandha (*Withania somnifera*)
■Ayurveda**

HC 052513 - 217

Date: October 4, 2002

RE: Ashwagandha Monograph Reviews Chemistry and Therapeutics of Popular Ayurvedic Herb

Mishra L-C, Singh BB, Dagenais S. Scientific basis for the therapeutic use of *Withania somnifera* (Ashwagandha): A review. *Alternative Medicine Review*. 2000 July;Vol. 5(4):334-346.

Withania somnifera Dunal (ashwagandha, WS) is a commonly used herb in Ayurvedic medicine, the traditional medical system of India. It is an ingredient in many formulations prescribed for a variety of musculoskeletal conditions and as a general tonic to increase energy; improve overall health and longevity; and prevent disease in athletes, the elderly, and during pregnancy. The purpose of this literature review was to identify and evaluate studies pertaining to the chemical properties, therapeutic benefits, and potential toxicity of the herb.

A total of 58 articles were found pertaining to the anti-inflammatory, antitumor, antistress, antioxidant, immunomodulatory, hemopoetic (formation of red blood cells) and rejuvenating properties of ashwagandha. Few, however, were discovered pertaining to the mechanism of action for these effects.

The chemistry of WS has been extensively studied and over 35 chemical constituents have been identified, extracted, and isolated. The biologically active chemical constituents are alkaloids, steroidal lactones, saponins, and withanolides. WS is also rich in iron.

Anti-inflammatory Properties—The effectiveness of ashwagandha in a variety of rheumatologic conditions may be due in part to its anti-inflammatory properties, as demonstrated in animal studies. However, only one clinical trial was found that supports the possible use of WS for arthritis.

Antitumor Properties—Several animal studies are suggestive of antitumor activity as well as enhancement of the effects of radiation by WS. However, no human studies were included in the review.

Antistress Effect—Several animal studies have found that WS induces a state of nonspecific increased resistance to stress, as measured by an increase in the length of time the animals were able to exercise; reduced stress-induced increases in blood urea nitrogen, blood lactic acid and adrenal hypertrophy; and reduced anabolic activity (promotes assimilation of nutritive matter). The authors of the review speculated that if the results could be reproduced in humans, they would support the use of WS in nervous exhaustion due to stress and in cachexia (general lack of nutrition and wasting occurring in the course of a chronic disease or emotional disturbance) to increase body weight.

Antioxidant Effect—Animal studies suggest that WS has an antioxidant effect in the brain, which may be responsible for its diverse pharmacological properties.

Immunomodulatory Properties—Laboratory studies have found that a root extract of WS stimulates hemolytic antibody responses (creating an immune response in the red blood cells) toward human erythrocytes (red blood cells) indicating immunostimulatory activity. It was also tested in mice subjected to myelosuppression (suppression of the bone marrow's production of blood cells and platelets) and was found to significantly increase hemoglobin concentration, red blood cell count, white blood cell count, platelet count, and body weight compared to untreated mice.

Hemopoetic Effect—Administration of WS extract was found to significantly reduce leukopenia (a condition in which the number of leukocytes circulating in the blood is abnormally low) induced by cyclophosphamide treatment in mice. The major activity of WS may be the stimulation of stem cell proliferation.

Rejuvenating Effect—In one of the few human studies, children were given WS for 60 days to test its growth-promoting effect. Hemoglobin, packed cell volume, mean corpuscular volume, serum iron, body weight, and hand grip were all evaluated. The findings suggest that WS may be useful as a growth promoter and hematinic (an agent that tends to stimulate blood cell formation or to increase the hemoglobin in the blood) in growing children.

Nervous System Effects—Studies have found that a total alkaloid extract (ashwagandholine, AG) of WS roots exhibited taming and mild depressant effects on the central nervous system of monkeys, cats, dogs, albino rats, and mice. The results were consistent with the use of WS to produce relaxation.

Effects on the Cardiopulmonary System—The effect of AG was studied on the cardiovascular and respiratory systems in dogs and frogs. The studies were found to be consistent with the use of WS as a tranquilizing agent. The pharmacological actions of AG on the cardiovascular and respiratory systems appeared to be due to its alkaloid content.

The authors concluded that, while the results from the studies reviewed show promise for the use of ashwagandha as a multi-purpose medicinal agent, the current literature has several limitations. While more clinical trials should be conducted to support its therapeutic use, the lack of systematic toxicity studies is of concern, as is the poor quality of the existing toxicity studies. Nevertheless, insofar as ashwagandha has been one of the most revered and widely used medicinal herbs in the entire system of Ayurveda for several thousand years, its relative long-term safety can be reasonably presumed.

Incidentally, ashwagandha has been frequently called "Indian ginseng" -- a term denoting its level of respect and multiple tonic-like application in Ayurvedic traditional medicine. However, ashwagandha is NOT related to true ginseng (*Panax* spp.) as it is in Solanaceae, the nightshade family, while *Panax* is in the Araliaceae family. The American Botanical Council does not condone the mis-labeling of

ashwagandha as "Indian ginseng" and a provision in the Agriculture bill of 2002 now makes the labeling of any non-*Panax* species as "ginseng" illegal in the U.S.

-Densie Webb, Ph.D.

Enclosure: Referenced article reprinted with permission from Alternative Medicine Review, PO Box 25, Dover, Idaho, 83825.

The American Botanical Council provides this review as an educational service. By providing this service, ABC does not warrant that the data is accurate and correct, nor does distribution of the article constitute any endorsement of the information contained or of the views of the authors.

ABC does not authorize the copying or use of the original articles. Reproduction of the reviews is allowed on a limited basis for students, colleagues, employees and/or members. Other uses and distribution require prior approval from ABC.