Ashwagandha

url: https://medlineplus.gov/druginfo/natural/953.html  
  
Ashwagandha  
What is it?  
Ashwagandha is an evergreen shrub that grows in Asia and Africa. It is commonly used for stress. There is little evidence for its use as an "adaptogen."   
  
Ashwagandha contains chemicals that might help calm the brain, reduce swelling, lower blood pressure, and alter the immune system.  
  
Since ashwagandha is traditionally used as an adaptogen, it is used for many conditions related to stress. Adaptogens are believed to help the body resist physical and mental stress. Some of the conditions it is used for include insomnia, aging, anxiety and many others, but there is no good scientific evidence to support most of these uses. There is also no good evidence to support using ashwagandha for COVID-19.  
  
Don't confuse ashwagandha with Physalis alkekengi. Both are known as winter cherry. Also, don't confuse ashwagandha with American ginseng, Panax ginseng, or eleuthero.  
  
  
How effective is it?  
Natural Medicines Comprehensive Database rates effectiveness based on scientific evidence according to the following scale: Effective, Likely Effective, Possibly Effective, Possibly Ineffective, Likely Ineffective, Ineffective, and Insufficient Evidence to Rate.The effectiveness ratings for ASHWAGANDHA are as follows:Possibly effective for...  
A type of persistent anxiety marked by exaggerated worry and tension (generalized anxiety disorder or GAD). Taking ashwagandha by mouth seems to improve anxiety in people with persistent anxiety.   
Insomnia. Taking ashwagandha by mouth seems to improve overall sleep and sleep quality in some people.  
Stress. Taking ashwagandha by mouth seems to help reduce stress in some people. It might also help reduce stress-related weight gain.  
  
  
There is interest in using ashwagandha for a number of other purposes, but there isn't enough reliable information to say whether it might be helpful.  
  
  
Is it safe?  
When taken by mouth: Ashwagandha is possibly safe when used for up to 3 months. The long-term safety of ashwagandha is not known. Large doses of ashwagandha might cause stomach upset, diarrhea, and vomiting. Rarely, liver problems, including severe liver failure and a need for liver transplantation, might occur.   
When applied to the skin: Lotion containing ashwagandha is possibly safe when used for up to 2 months.  
Special precautions & warnings:  
Pregnancy: It is likely unsafe to use ashwagandha when pregnant. There is some evidence that ashwagandha might cause miscarriages.  
Breast-feeding: There isn't enough reliable information to know if ashwagandha is safe to use when breast-feeding. Stay on the safe side and avoid use.  
"Auto-immune diseases" such as multiple sclerosis (MS), lupus (systemic lupus erythematosus, SLE), rheumatoid arthritis (RA), or other conditions: Ashwagandha might cause the immune system to become more active, and this could increase the symptoms of auto-immune diseases. If you have one of these conditions, it's best to avoid using ashwagandha.  
Surgery: Ashwagandha may slow down the central nervous system. Healthcare providers worry that anesthesia and other medications during and after surgery might increase this effect. Stop taking ashwagandha at least 2 weeks before a scheduled surgery.  
Thyroid disorders: Ashwagandha might increase thyroid hormone levels. Ashwagandha should be used cautiously or avoided if you have a thyroid condition or take thyroid hormone medications.  
  
  
Are there interactions with medications?  
ModerateBe cautious with this combination.Medications for diabetes (Antidiabetes drugs)Ashwagandha might lower blood sugar levels. Taking ashwagandha along with diabetes medications might cause blood sugar to drop too low. Monitor your blood sugar closely.Medications for high blood pressure (Antihypertensive drugs)Ashwagandha might lower blood pressure. Taking ashwagandha along with medications that lower blood pressure might cause blood pressure to go too low. Monitor your blood pressure closely.Medications that decrease the immune system (Immunosuppressants)Ashwagandha can increase the activity of the immune system. Some medications, such as those used after a transplant, decrease the activity of the immune system. Taking ashwagandha along with these medications might decrease the effects of these medications.Sedative medications (Benzodiazepines)Ashwagandha might cause sleepiness and slowed breathing. Some medications, called sedatives, can also cause sleepiness and slowed breathing. Taking ashwagandha with sedative medications might cause breathing problems and/or too much sleepiness.Sedative medications (CNS depressants)Ashwagandha might cause sleepiness and slowed breathing. Some medications, called sedatives, can also cause sleepiness and slowed breathing. Taking ashwagandha with sedative medications might cause breathing problems and/or too much sleepiness.Thyroid hormoneThe body naturally produces thyroid hormones. Ashwagandha might increase how much thyroid hormone the body produces. Taking ashwagandha with thyroid hormone pills might cause too much thyroid hormone in the body, and increase the effects and side effects of thyroid hormone.  
  
  
Are there interactions with herbs and supplements?  
Herbs and supplements that might lower blood pressureAshwagandha might lower blood pressure. Taking it with other supplements that have the same effect might cause blood pressure to drop too much. Examples of supplements with this effect include andrographis, casein peptides, L-arginine, niacin, and stinging nettle.Herbs and supplements with sedative propertiesAshwagandha might cause sleepiness and slowed breathing. Taking it along with other supplements with similar effects might cause too much sleepiness and/or slowed breathing in some people. Examples of supplements with this effect include hops, kava, L-tryptophan, melatonin, and valerian.  
  
  
Are there interactions with foods?  
There are no known interactions with foods.  
  
  
How is it typically used?  
Ashwagandha has most often been used by adults in doses up to 1000 mg daily, for up to 12 weeks. Speak with a healthcare provider to find out what dose might be best for a specific condition.  
  
  
Other names  
Ajagandha, Amangura, Amukkirag, Asan, Asana, Asgand, Asgandh, Asgandha, Ashagandha, Ashvagandha, Ashwaganda, Ashwanga, Asoda, Asundha, Asvagandha, Aswagandha, Avarada, Ayurvedic Ginseng, Cerise d'Hiver, Clustered Wintercherry, Ghoda Asoda, Ginseng Ayurv dique, Ginseng Indien, Hayahvaya, Indian Ginseng, Kanaje Hindi, Kuthmithi, Orovale, Peyette, Physalis somnifera, Samm Al Ferakh, Samm Al Rerakh, Sogade-Beru, Strychnos, Turangi-Ghanda, Vajigandha, Winter Cherry, Withania, Withania somnifera.  
  
  
Methodology  
  
 To learn more about how this article was written, please see the Natural Medicines Comprehensive Database methodology.   
   
  
  
References  
Narra K, Naik SK, Ghatge AS. A Study of Efficacy and Safety of Ashwagandha (Withania somnifera) Lotion on Facial Skin in Photoaged Healthy Adults. Cureus 2023;15:e36168. View abstract.  
T th M, Benedek AE, Longerich T, Seitz HK. Ashwagandha-induced acute liver injury: A case report. Clin Case Rep 2023;11:e7078. View abstract.  
Lubarska M, Halasinski P, Hryhorowicz S, et al. Liver Dangers of Herbal Products: A Case Report of Ashwagandha-Induced Liver Injury. Int J Environ Res Public Health 2023;20:3921. View abstract.  
Ajgaonkar A, Jain M, Debnath K. Efficacy and Safety of Ashwagandha (Withania somnifera) Root Extract for Improvement of Sexual Health in Healthy Women: A Prospective, Randomized, Placebo-Controlled Study. Cureus 2022;14:e30787. View abstract.  
Pusec CM, Wolsky R, Llerena C, Sura P. A Case of Supplement-Induced Hepatitis. Cureus 2022;14:e30433. View abstract.  
Suryawanshi G, Abdallah M, Thomson M, Desai N, Chauhan A, Lim N. Ashwagandha-Associated Acute Liver Failure Requiring Liver Transplantation. Am J Ther 2023;30:e80-e83. View abstract.  
Sarris J, Ravindran A, Yatham LN, et al. Clinician guidelines for the treatment of psychiatric disorders with nutraceuticals and phytoceuticals: The World Federation of Societies of Biological Psychiatry (WFSBP) and Canadian Network for Mood and Anxiety Treatments (CANMAT) Taskforce. World J Biol Psychiatry. 2022;23:424-455. View abstract.  
Chitre D, Nadkarni S, Jagtap N, et al. Phase III randomized clinical trial of BV-4051, an Ayurvedic polyherbal formulation in moderate SARS-CoV-2 infections and its impact on inflammatory biomarkers. Phytother Res 2022. View abstract.  
O'Connor J, Lindsay K, Baker C, Kirby J, Hutchins A, Harris M. The impact of ashwagandha on stress, sleep quality, and food cravings in college students: quantitative analysis of a double-blind randomized control trial. J Med Food 2022. View abstract.  
Baker C, Kirby JB, O'Connor J, Lindsay KG, Hutchins A, Harris M. The perceived impact of ashwagandha on stress, sleep quality, energy, and mental clarity for college students: qualitative analysis of a double-blind randomized control trial. J Med Food 2022. View abstract.  
Singh P, Salman KA, Shameem M, Warsi MS. Withania somnifera (L.) Dunal as add-on therapy for COPD patients: a randomized, placebo-controlled, double-blind study. Front Pharmacol 2022;13:901710. View abstract.  
Akhgarjand C, Asoudeh F, Bagheri A, et al. Does Ashwagandha supplementation have a beneficial effect on the management of anxiety and stress? A systematic review and meta-analysis of randomized controlled trials. Phytother Res 2022. View abstract.  
Chauhan S, Srivastava MK, Pathak AK. Effect of standardized root extract of ashwagandha (Withania somnifera) on well-being and sexual performance in adult males: a randomized controlled trial. Health Sci Rep 2022;5:e741. View abstract.  
Kamal HI, Patel K, Brdak A, Heffernan J, Ahmad N. Ashwagandha as a unique cause of thyrotoxicosis presenting with supraventricular tachycardia. Cureus. 2022 Mar 25;14:e23494. View abstract.  
Kumar S, Bouic PJ, Rosenkranz B. Investigation of CYP2B6, 3A4 and -esterase interactions of Withania somnifera (L.) dunal in human liver microsomes and HepG2 cells. J Ethnopharmacol. 2021;270:113766. View abstract.  
Ireland PJ, Hardy T, Burt AD, Donnelly MC. Drug-induced hepatocellular injury due to herbal supplement ashwagandha. J R Coll Physicians Edinb. 2021;51:363-365. View abstract.  
Gopukumar K, Thanawala S, Somepalli V, Rao TSS, Thamatam VB, Chauhan S. Efficacy and safety of ashwagandha root extract on cognitive functions in healthy, stressed adults: a randomized, double-blind, placebo-controlled study. Evid Based Complement Alternat Med. 2021 Nov 30;2021:8254344. View abstract.  
Remenapp A, Coyle K, Orange T, et al. Efficacy of Withania somnifera supplementation on adult's cognition and mood. J Ayurveda Integr Med. 2021 Nov 25;13:100510. View abstract.  
Tharakan A, Shukla H, Benny IR, Tharakan M, George L, Koshy S. Immunomodulatory Effect of Withania somnifera (Ashwagandha) Extract-A Randomized, Double-Blind, Placebo Controlled Trial with an Open Label Extension on Healthy Participants. J Clin Med 2021;10:3644. View abstract.  
Gopal S, Ajgaonkar A, Kanchi P, et al. Effect of an ashwagandha (Withania Somnifera) root extract on climacteric symptoms in women during perimenopause: A randomized, double-blind, placebo-controlled study. J Obstet Gynaecol Res 2021. View abstract.  
Cheah KL, Norhayati MN, Husniati Yaacob L, Abdul Rahman R. Effect of Ashwagandha (Withania somnifera) extract on sleep: A systematic review and meta-analysis. PLoS One 2021;16:e0257843. View abstract.  
Bonilla DA, Moreno Y, Gho C, Petro JL, Odriozola-Mart nez A, Kreider RB. Effects of ashwagandha (Withania somnifera) on physical performance: systematic review and Bayesian meta-analysis. J Funct Morphol Kinesiol. 2021 Feb 11;6:20. doi: 10.3390/jfmk6010020. View abstract.  
Deshpande A, Irani N, Balkrishnan R, Benny IR. A randomized, double blind, placebo controlled study to evaluate the effects of ashwagandha (Withania somnifera) extract on sleep quality in healthy adults. Sleep Med. 2020;72:28-36. View abstract.  
Fuladi S, Emami SA, Mohammadpour AH, Karimani A, Manteghi AA, Sahebkar A. Assessment of Withania somnifera root extract efficacy in patients with generalized anxiety disorder: A randomized double-blind placebo-controlled trial. Curr Clin Pharmacol. 2020. View abstract.  
Bj rnsson HK, Bj rnsson ES, Avula B, et al. Ashwagandha-induced liver injury: A case series from Iceland and the US Drug-Induced Liver Injury Network. Liver Int. 2020;40:825-829. View abstract.  
Durg S, Bavage S, Shivaram SB. Withania somnifera (Indian ginseng) in diabetes mellitus: A systematic review and meta-analysis of scientific evidence from experimental research to clinical application. Phytother Res. 2020;34:1041-1059. View abstract.  
Kelgane SB, Salve J, Sampara P, Debnath K. Efficacy and tolerability of ashwagandha root extract in the elderly for improvement of general well-being and sleep: A prospective, randomized, double-blind, placebo-controlled study. Cureus. 2020;12:e7083. View abstract.  
P rez-G mez J, Villafaina S, Adsuar JC, Merellano-Navarro E, Collado-Mateo D. Effects of ashwagandha (Withania somnifera) on VO2max: A systematic review and meta-analysis. Nutrients. 2020;12:1119. View abstract.  
Salve J, Pate S, Debnath K, Langade D. Adaptogenic and anxiolytic effects of ashwagandha root extract in healthy adults: A double-blind, randomized, placebo-controlled clinical study. Cureus. 2019;11:e6466. View abstract.  
Lopresti AL, Smith SJ, Malvi H, Kodgule R. An investigation into the stress-relieving and pharmacological actions of an ashwagandha (Withania somnifera) extract: A randomized, double-blind, placebo-controlled study. Medicine (Baltimore). 2019;98:e17186. View abstract.  
Sharma AK, Basu I, Singh S. Efficacy and safety of Ashwagandha root extract in subclinical hypothyroid patients: a double-blind, randomized placebo-controlled trial. J Altern Complement Med. 2018 Mar;24:243-248. View abstract.  
Kumar G, Srivastava A, Sharma SK, Rao TD, Gupta YK. Efficacy and safety evaluation of ayurvedic treatment (ashwagandha powder and sidh makardhwaj) in rheumatoid arthritis patients: a pilot perspective study. Indian J Med Res 2015 Jan;141:100-6. View abstract.  
Dongre S, Langade D, Bhattacharyya S. Efficacy and safety of ashwagandha (withania somnifera) root extract in improving sexual function in women: a pilot study. Biomed Res Int 2015;2015:284154.View abstract.  
Jahanbakhsh SP, Manteghi AA, Emami SA, Mahyari S, et al. Evaluation of the efficacy of withania somnifera (ashwagandha) root extract in patients with obsessive-compulsive disorder: a randomized double-blind placebo-controlled trial. Complement Ther Med 2016 Aug;27:25-9.View abstract.  
Choudhary D, Bhattacharyya S, Joshi K. Body weight management in adults under chronic stress through treatment with ashwagandha root extract: a double-blind, randomized, placebo-controlled trial. J Evid Based Complementary Altern Med. 2017 Jan;22:96-106 View abstract.  
Sud Khyati S, Thaker B. A randomized double blind placebo controlled study of ashwagandha on generalized anxiety disorder. Int Ayurvedic Med J 2013;1:1-7.   
Chengappa KN, Bowie CR, Schlicht PJ, Fleet D, Brar JS, Jindal R. Randomized placebo-controlled adjunctive study of an extract of withania somnifera for cognitive dysfunction in bipolar disorder. J Clin Psychiatry. 2013;74:1076-83. View abstract.  
Chandrasekhar K, Kapoor J, Anishetty S. A prospective, randomized double-blind, placebo-controlled study of safety and efficacy of a high-concentration full-spectrum extract of ashwagandha root in reducing stress and anxiety in adults. Indian J Psychol Med. 2012;34:255-62. View abstract.  
Biswal BM, Sulaiman SA, Ismail HC, Zakaria H, Musa KI. Effect of Withania somnifera (Ashwagandha) on the development of chemotherapy-induced fatigue and quality of life in breast cancer patients. Integr Cancer Ther. 2013;12:312-22. View abstract.  
Ambiye VR, Langade D, Dongre S, Aptikar P, Kulkarni M, Dongre A. Clinical Evaluation of the Spermatogenic Activity of the Root Extract of Ashwagandha (Withania somnifera) in Oligospermic Males: A Pilot Study. Evid Based Complement Alternat Med. 2013;2013:571420. View abstract.  
Agnihotri AP, Sontakke SD, Thawani VR, Saoji A, Goswami VS. Effects of Withania somnifera in patients of schizophrenia: a randomized, double blind, placebo controlled pilot trial study. Indian J Pharmacol. 2013;45:417-8. View abstract.  
 Anbalagan K and Sadique J. Withania somnifera (ashwagandha), a rejuvenating herbal drug which controls alpha-2 macroglobulin synthesis during inflammation. Int.J.Crude Drug Res. 1985;23:177-183.  
 Venkataraghavan S, Seshadri C, Sundaresan TP, and et al. The comparative effect of milk fortified with Aswagandha, Aswagandha and Punarnava in children - a double-blind study. J Res Ayur Sid 1980;1:370-385.  
 Ghosal S, Lal J, Srivastava R, and et al. Immunomodulatory and CNS effects of sitoindosides 9 and 10, two new glycowithanolides from Withania somnifera. Phytotherapy Research 1989;3:201-206.  
 Upadhaya L and et al. Role of an indigenous drug Geriforte on blood levels of biogenic amines and its significance in the treatment of anxiety neurosis. Acta Nerv Super 1990;32:1-5.  
 Ahumada F, Aspee F, Wikman G, and et al. Withania somnifera extract. Its effect on arterial blood pressure in anaesthetized dogs. Phytotherapy Research 1991;5:111-114.  
 Kuppurajan K, Rajagopalan SS, Sitoraman R, and et al. Effect of Ashwagandha (Withania somnifera Dunal) on the process of ageing on human volunteers. Journal of Research in Ayurveda and Siddha 1980;1:247-258.  
 Dhuley, J. N. Effect of ashwagandha on lipid peroxidation in stress-induced animals. J Ethnopharmacol. 1998;60:173-178. View abstract.  
 Dhuley, J. N. Therapeutic efficacy of Ashwagandha against experimental aspergillosis in mice. Immunopharmacol.Immunotoxicol. 1998;20:191-198. View abstract.  
 Sharada, A. C., Solomon, F. E., Devi, P. U., Udupa, N., and Srinivasan, K. K. Antitumor and radiosensitizing effects of withaferin A on mouse Ehrlich ascites carcinoma in vivo. Acta Oncol. 1996;35:95-100. View abstract.  
 Devi, P. U., Sharada, A. C., and Solomon, F. E. Antitumor and radiosensitizing effects of Withania somnifera (Ashwagandha) on a transplantable mouse tumor, Sarcoma-180. Indian J Exp Biol. 1993;31:607-611. View abstract.  
 Praveenkumar, V., Kuttan, R., and Kuttan, G. Chemoprotective action of Rasayanas against cyclosphamide toxicity. Tumori 8-31-1994;80:306-308. View abstract.  
 Devi, P. U., Sharada, A. C., and Solomon, F. E. In vivo growth inhibitory and radiosensitizing effects of withaferin A on mouse Ehrlich ascites carcinoma. Cancer Lett. 8-16-1995;95(1-2):189-193. View abstract.  
 Anbalagan, K. and Sadique, J. Influence of an Indian medicine (Ashwagandha) on acute-phase reactants in inflammation. Indian J Exp Biol. 1981;19:245-249. View abstract.  
 Malhotra, C. L., Mehta, V. L., Prasad, K., and Das, P. K. Studies on Withania ashwagandha, Kaul. IV. The effect of total alkaloids on the smooth muscles. Indian J Physiol Pharmacol. 1965;9:9-15. View abstract.  
 Malhotra, C. L., Mehta, V. L., Das, P. K., and Dhalla, N. S. Studies on Withania-ashwagandha, Kaul. V. The effect of total alkaloids (ashwagandholine) on the central nervous system. Indian J Physiol Pharmacol. 1965;9:127-136. View abstract.  
 Begum, V. H. and Sadique, J. Long term effect of herbal drug Withania somnifera on adjuvant induced arthritis in rats. Indian J Exp Biol. 1988;26:877-882. View abstract.  
 Vaishnavi, K., Saxena, N., Shah, N., Singh, R., Manjunath, K., Uthayakumar, M., Kanaujia, S. P., Kaul, S. C., Sekar, K., and Wadhwa, R. Differential activities of the two closely related withanolides, Withaferin A and Withanone: bioinformatics and experimental evidences. PLoS.One. 2012;7:e44419. View abstract.  
 Sehgal, V. N., Verma, P., and Bhattacharya, S. N. Fixed-drug eruption caused by ashwagandha (Withania somnifera): a widely used Ayurvedic drug. Skinmed. 2012;10:48-49. View abstract.  
 Malviya, N., Jain, S., Gupta, V. B., and Vyas, S. Recent studies on aphrodisiac herbs for the management of male sexual dysfunction--a review. Acta Pol.Pharm. 2011;68:3-8. View abstract.  
 Ven Murthy, M. R., Ranjekar, P. K., Ramassamy, C., and Deshpande, M. Scientific basis for the use of Indian ayurvedic medicinal plants in the treatment of neurodegenerative disorders: ashwagandha. Cent.Nerv.Syst.Agents Med.Chem. 9-1-2010;10:238-246. View abstract.  
 Bhat, J., Damle, A., Vaishnav, P. P., Albers, R., Joshi, M., and Banerjee, G. In vivo enhancement of natural killer cell activity through tea fortified with Ayurvedic herbs. Phytother.Res 2010;24:129-135. View abstract.  
 Mikolai, J., Erlandsen, A., Murison, A., Brown, K. A., Gregory, W. L., Raman-Caplan, P., and Zwickey, H. L. In vivo effects of Ashwagandha (Withania somnifera) extract on the activation of lymphocytes. J.Altern.Complement Med. 2009;15:423-430. View abstract.  
 Lu, L., Liu, Y., Zhu, W., Shi, J., Liu, Y., Ling, W., and Kosten, T. R. Traditional medicine in the treatment of drug addiction. Am J Drug Alcohol Abuse 2009;35:1-11. View abstract.  
 Singh, R. H., Narsimhamurthy, K., and Singh, G. Neuronutrient impact of Ayurvedic Rasayana therapy in brain aging. Biogerontology. 2008;9:369-374. View abstract.  
 Tohda, C. [Overcoming several neurodegenerative diseases by traditional medicines: the development of therapeutic medicines and unraveling pathophysiological mechanisms]. Yakugaku Zasshi 2008;128:1159-1167. View abstract.  
 Deocaris, C. C., Widodo, N., Wadhwa, R., and Kaul, S. C. Merger of ayurveda and tissue culture-based functional genomics: inspirations from systems biology. J.Transl.Med. 2008;6:14. View abstract.  
 Kulkarni, S. K. and Dhir, A. Withania somnifera: an Indian ginseng. Prog.Neuropsychopharmacol.Biol.Psychiatry 7-1-2008;32:1093-1105. View abstract.  
 Choudhary, M. I., Nawaz, S. A., ul-Haq, Z., Lodhi, M. A., Ghayur, M. N., Jalil, S., Riaz, N., Yousuf, S., Malik, A., Gilani, A. H., and ur-Rahman, A. Withanolides, a new class of natural cholinesterase inhibitors with calcium antagonistic properties. Biochem.Biophys.Res Commun. 8-19-2005;334:276-287. View abstract.  
 Khattak, S., Saeed, Ur Rehman, Shah, H. U., Khan, T., and Ahmad, M. In vitro enzyme inhibition activities of crude ethanolic extracts derived from medicinal plants of Pakistan. Nat.Prod.Res 2005;19:567-571. View abstract.  
 Kaur, K., Rani, G., Widodo, N., Nagpal, A., Taira, K., Kaul, S. C., and Wadhwa, R. Evaluation of the anti-proliferative and anti-oxidative activities of leaf extract from in vivo and in vitro raised Ashwagandha. Food Chem.Toxicol. 2004;42:2015-2020. View abstract.  
 Devi, P. U., Sharada, A. C., Solomon, F. E., and Kamath, M. S. In vivo growth inhibitory effect of Withania somnifera (Ashwagandha) on a transplantable mouse tumor, Sarcoma 180. Indian J Exp Biol. 1992;30:169-172. View abstract.  
 Gupta, S. K., Dua, A., and Vohra, B. P. Withania somnifera (Ashwagandha) attenuates antioxidant defense in aged spinal cord and inhibits copper induced lipid peroxidation and protein oxidative modifications. Drug Metabol.Drug Interact. 2003;19:211-222. View abstract.  
 Bhattacharya, S. K. and Muruganandam, A. V. Adaptogenic activity of Withania somnifera: an experimental study using a rat model of chronic stress. Pharmacol Biochem.Behav 2003;75:547-555. View abstract.  
 Davis, L. and Kuttan, G. Effect of Withania somnifera on DMBA induced carcinogenesis. J Ethnopharmacol. 2001;75(2-3):165-168. View abstract.  
 Bhattacharya, S. K., Bhattacharya, A., Sairam, K., and Ghosal, S. Anxiolytic-antidepressant activity of Withania somnifera glycowithanolides: an experimental study. Phytomedicine 2000;7:463-469. View abstract.  
Panda S, Kar A. Changes in thyroid hormone concentrations after administration of ashwagandha root extract to adult male mice. J Pharm Pharmacol 1998;50:1065-68. View abstract.  
Panda S, Kar A. Withania somnifera and Bauhinia purpurea in the regulation of circulating thyroid hormone concentrations in female mice. J Ethnopharmacol 1999;67:233-39. View abstract.  
Agarwal R, Diwanay S, Patki P, Patwardhan B. Studies on immunomodulatory activity of Withania somnifera (Ashwagandha) extracts in experimental immune inflammation. J Ethnopharmacol 1999;67:27-35. View abstract.  
Ahumada F, Aspee F, Wikman G, Hancke J. Withania somnifera exract. Its effects on arterial blood pressure in anaesthetized dogs. Phytother Res 1991;5:111-14.  
Kulkarni RR, Patki PS, Jog VP, et al. Treatment of osteoarthritis with a herbomineral formulation: a double-blind, placebo-controlled, cross-over study. J Ethnopharmacol 1991;33:91-5. View abstract.  
Ahmad MK, Mahdi AA, Shukla KK, et al. Withania somnifera improves semen quality by regulating reproductive hormone levels and oxidative stress in seminal plasma of infertile males. Fertil Steril 2010;94:989-96. View abstract.  
Andallu B, Radhika B. Hypoglycemic, diuretic and hypocholesterolemic effect of winter cherry (Withania somnifera, Dunal) root. Indian J Exp Biol 2000;38:607-9. View abstract.  
Sriranjini SJ, Pal PK, Devidas KV, Ganpathy S. Improvement of balance in progressive degenerative cerebellar ataxias after Ayurvedic therapy: a preliminary report. Neurol India 2009;57:166-71. View abstract.  
Katz M, Levine AA, Kol-Degani H, Kav-Venaki L. A compound herbal preparation (CHP) in the treatment of children with ADHD: a randomized controlled trial. J Atten Disord 2010;14:281-91. View abstract.  
Cooley K, Szczurko O, Perri D, et al. Naturopathic care for anxiety: a randomized controlled trial ISRC TN78958974. PLoS One 2009;4:e6628. View abstract.  
Dasgupta A, Tso G, Wells A. Effect of Asian ginseng, Siberian ginseng, and Indian ayurvedic medicine Ashwagandha on serum digoxin measurement by Digoxin III, a new digoxin immunoassay. J Clin Lab Anal 2008;22:295-301. View abstract.  
Dasgupta A, Peterson A, Wells A, Actor JK. Effect of Indian Ayurvedic medicine Ashwagandha on measurement of serum digoxin and 11 commonly monitored drugs using immunoassays: study of protein binding and interaction with Digibind. Arch Pathol Lab Med 2007;131:1298-303. View abstract.  
Mishra LC, Singh BB, Dagenais S. Scientific basis for the therapeutic use of Withania somnifera (ashwagandha): a review. Altern Med Rev 2000;5:334-46. View abstract.  
Nagashayana N, Sankarankutty P, Nampoothiri MRV, et al. Association of l-DOPA with recovery following Ayurveda medication in Parkinson's Disease. J Neurol Sci 2000;176:124-7. View abstract.  
Bhattacharya SK, Satyan KS, Ghosal S. Antioxidant activity of glycowithanolides from Withania somnifera. Indian J Exp Biol 1997;35:236-9. View abstract.  
Davis L, Kuttan G. Suppressive effect of cyclophosphamide-induced toxicity by Withania somnifera extract in mice. J Ethnopharmacol 1998;62:209-14. View abstract.  
Archana R, Namasivayam A. Antistressor effect of Withania somnifera. J Ethnopharmacol 1999;64:91-3. View abstract.  
Davis L, Kuttan G. Effect of Withania somnifera on cyclophosphamide-induced urotoxicity. Cancer Lett 2000;148:9-17. View abstract.  
Upton R, ed. Ashwagandha Root (Withania somnifera): Analytical, quality control, and therapuetic monograph. Santa Cruz, CA: American Herbal Pharmacopoeia 2000:1-25.  
McGuffin M, Hobbs C, Upton R, Goldberg A, eds. American Herbal Products Association's Botanical Safety Handbook. Boca Raton, FL: CRC Press, LLC 1997.