



Cognitive Clarity and Focus

Memory Enhancement, Learning, Focus and Attention

“ "Ashwagandha improves both immediate and general memory in people with mild cognitive impairment."



Efficacy and Safety of Ashwagandha (*Withania somnifera*) Root Extract in Improving Memory and Cognitive Functions.



Choudhary, D., Bhattacharyya, S., & Bose, S. (2017). *Journal of Dietary Supplements*, 14(6), 599-612.

“ "Our study provides preliminary evidence that consumption of *Withania somnifera* can improve cognitive function in humans."



Examining the effect of *Withania somnifera* supplementation on muscle strength and recovery: a randomized controlled trial.



Wankhede, S., Langade, D., Joshi, K., Sinha, S. R., & Bhattacharyya, S. (2015). *Journal of the International Society of Sports Nutrition*, 12, 43.

“ "Ashwagandha may be effective in enhancing both immediate and general memory in people with MCI [Mild Cognitive Impairment] as well as improving executive function, attention, and information processing speed."



Efficacy and Safety of Ashwagandha (*Withania somnifera*) Root Extract in Improving Memory and Cognitive Functions.



Choudhary, D., Bhattacharyya, S., & Bose, S. (2017). *Journal of Dietary Supplements*, 14(6), 599-612





“ "Ashwagandha treatment significantly improved executive function, sustained attention, and information-processing speed."



Naturopathic care for anxiety: a randomized controlled trial.



Cooley, K., Szczurko, O., Perri, D., Mills, E. J., Bernhardt, B., Zhou, Q., & Seely, D. (2009). PLoS One, 4(8), e6628.

“ "Ashwagandha leaf extract: a potential agent in treating oxidative damage and physiological abnormalities seen in a mouse model of Parkinson's."



Neuroprotective effects of *Withania somnifera* on 6-hydroxydopamine induced Parkinsonism in rats.



RajaSankar, S., Manivasagam, T., & Sankar, V. (2009). Human & Experimental Toxicology, 28(3), 137- 142.

“ "Withania somnifera extract improves cognitive and psychomotor performance and is well tolerated."



Effects of *Withania somnifera* (Ashwagandha) and *Terminalia arjuna* (Arjuna) on physical performance and cardiorespiratory endurance in healthy young adults.



Sandhu, J.S., Shah, B., Shenoy, S., Chauhan, S., Lavekar, G.S., & Padhi, M.M. (2010). International Journal of Ayurveda Research, 1(3), 144-149.

“ "The study results suggest that ashwagandha could improve brain function, memory, reaction times, and the ability to perform tasks."



Efficacy and Safety of Ashwagandha (*Withania somnifera* (L.) Dunal) Root Extract in Improving Memory and Cognitive Functions.



Choudhary, D., Bhattacharyya, S., & Bose, S. (2017). Journal of Dietary Supplements, 14(6), 599– 612.





“Cognition scores were significantly improved... in the Ashwagandha group... without any side effects.”



Ayurvedic medicine offers a good alternative to glucosamine and celecoxib in the treatment of symptomatic knee osteoarthritis: a randomized, double-blind, controlled equivalence drug trial.



Srivastava, S., Bankar, R., & Gupta, S. (2013). *Rheumatology (Oxford)*, 52(8), 1408-1417.



Enhanced Mindfulness and Creativity

Alpha Waves, Gamma Waves, Stress Reduction, Relaxation

“Withania somnifera enhances the resilience to stress-induced physiological changes.”



An Overview on Ashwagandha: A Rasayana (Rejuvenator) of Ayurveda.



Afrin, S., Adhikari, B. S., & Bhat, B. (2016). *African Journal of Traditional, Complementary, and Alternative Medicines*, 13(5), 88-94.



Emotional Mastery

Mood Enhancement & Regulation, Stress Reduction, Relaxation

“The treatment group that was given the high-concentration full-spectrum Ashwagandha root extract exhibited a significant reduction ($P < 0.0001$) in scores on all the stress-assessment scales on Day 60, relative to the placebo group.”



A Standardized Withania Somnifera Extract Significantly Reduces Stress-Related Parameters in Chronically Stressed Humans: A Double-Blind, Randomized, Placebo-Controlled Study.



Auddy, B., Hazra, J., Mitra, A., Abedon, B., & Ghosal, S. (2008). *Journal of the American Nutraceutical Association*, 11(1), 50-56.

“ = Study Result or Quote



= Study Title



= Study Citation



“ “Our results provide preliminary evidence that dietary supplementation with an ashwagandha extract may ameliorate fatigue, vigor, and sexual and psychological well-being in healthy, aging adults.”



An Investigation into the Stress-Relieving and Pharmacological Actions of an Ashwagandha (*Withania somnifera*) Extract.



Lopresti, A. L., Drummond, P. D., & Smith, S. J. (2019). *Medicine*, 98(37).

“ “Withania somnifera (Ashwagandha) treatment effectively ameliorated anxiety scores over the treatment periods.



Naturopathic Care for Anxiety: A Randomized Controlled Trial ISRCTN78958974.



Cooley, K., Szczurko, O., Perri, D., Mills, E. J., Bernhardt, B., Zhou, Q., & Seely, D. (2009). *PLoS One*, 4(8), e6628.

“ “Ashwagandha root extract safely and effectively improves an individual's resistance towards stress and thereby improves self-assessed quality of life.”



Efficacy and Safety of Ashwagandha (*Withania somnifera*) Root Extract in Improving Stress and Anxiety: A Double-blind, Randomized, Placebo-controlled Study.



Chandrasekhar, K., Kapoor, J., & Anishetty, S. (2012). *Indian Journal of Psychological Medicine*, 34(3), 255–262.

“ “Ashwagandha root extract can be used for body weight management in adults under chronic stress.”



Body Weight Management in Adults Under Chronic Stress Through Treatment With Ashwagandha Root Extract: A Double-Blind, Randomized, Placebo-Controlled Trial.



Choudhary, D., Bhattacharyya, S., & Joshi, K. (2017). *Journal of Evidence-Based Complementary & Alternative Medicine*, 22(1), 96-106.





“ "Ashwagandha was found to be effective in managing stress."



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.



Auddy, B., Hazra, J., Mitra, A., Abedon, B., & Ghosal, S. (2008). Indian Journal of Psychological Medicine, 30(1), 25-32.

“ "Significant reduction in stress and anxiety scores was observed with Ashwagandha."



Naturopathic care for Anxiety: a randomized controlled trial.



Cooley, K., Szczurko, O., Perri, D., Mills, E.J., Bernhardt, B., Zhou, Q., & Seely, D. (2009). PLoS ONE, 4(8), e6628.



Neural Protection and Growth

Neuron Health, Neuroprotection

“ "Withania somnifera reverses Alzheimer's disease pathology by enhancing low-density lipoprotein receptor-related protein in the liver."



Withania somnifera Reverses Alzheimer's Disease Pathology.



Sehgal, N., Gupta, A., Valli, R. K., Joshi, S. D., Mills, J. T., Hamel, E., ... & Sharma, S. K. (2012). Proceedings of the National Academy of Sciences, 109(9), 3510-3515.

“ "The aqueous extract of the roots of Withania somnifera showed a neuroprotective effect."



Neuroprotective Effects of Withania somnifera Dunn. in Hippocampal Sub-regions of Female Albino Rat.



Kulkarni, S. K., George, B., & Mathur, R. (1998). Phytotherapy Research, 12(5), 309-312.

“ = Study Result or Quote



= Study Title



= Study Citation



“ “Our findings suggest that *Withania somnifera* extract reduces oxidative stress in the brain and inhibits JNK pathway.”



Withania somnifera Root Extract Has Potent Cytotoxic Effect against Human Malignant Melanoma Cells.



Widodo, N., Priyandoko, D., Shah, N., Wadhwa, R., & Kaul, S.C. (2010). PLoS ONE 5(9): e12713.

“ “*Withania somnifera* extract exhibits neuroprotective effects against BPA-induced neurotoxicity.”



Neuroprotective Effects of *Withania somnifera* on BPA-Induced Neurotoxicity.



Dar, N.J., Hamid, A., & Ahmad, M. (2016). Environmental Toxicology and Pharmacology, 48, 197- 209.

“ “It can be concluded that Ashwagandha acts on the endocannabinoid system to exert its neuroprotective effects.”



Withania somnifera Induces Cytotoxic and Cytostatic Effects on Human T Leukemia Cells.



Srinivasan, S., Ranga, R.S., Burikhanov, R., Han, S.S., & Chendil, D. (2007). Toxicon, 49(7), 1006– 1016.

“ “*Withania somnifera* root extract can improve the levels of key Alzheimer's disease biomarkers in middle- aged mice.”



Withania somnifera Extract Enhances Energy Metabolism and Alleviates Aging-related Aggressiveness in Mice.



Kuboyama, T., Tohda, C., & Komatsu, K. (2014). Phytotherapy Research, 28(4), 643– 647.





“ "Ashwagandha exhibits nerve-protective effect and promotes regeneration in peripheral nerves."



Nerve Growth Factor-Mediated Enhancement of Axon Regeneration by *Withania somnifera*.



Soumyanath, A., Zhong, Y.P., Henson, E., Wadsworth, T., Bishop, J., Gold, S.A., & Quinn, J.F. (2019). *Phytotherapy Research*, 33(3), 666-674.



Neurochemical Harmony

Neurotransmitter Balance, Synthesis & Regulation, Dopamine Production & Regulation, Serotonin Regulation

“ "Ashwagandha leaf extract regulates key neuronal proteins and is linked with synaptic function and nerve cell survival."



Withania somnifera Reverses Alzheimer's Disease Pathology by Enhancing Low-Density Lipoprotein Receptor-Related Protein in Liver.



Sehgal, N., Gupta, A., Valli, R.K., Joshi, S.D., Mills, J.T., Hamel, E., ... & Saksena, S. (2012). *Proceedings of the National Academy of Sciences*, 109(9), 3510–3515.

“ "Ashwagandha augments levels of key synaptic markers required for cognitive function."



Neuroprotective effects of *Withania somnifera* on synaptic markers and dendritic structures.



Kuboyama, T., Tohda, C., Zhao, J., Nakamura, N., Hattori, M., & Komatsu, K. (2005). *Journal of Neurochemistry*, 93(1), 57-67.





Cellular Strength

Anti-Inflammatory Effects, Antioxidant Effects

“ "Ashwagandha shows strong antioxidant properties which protect against cellular damage."



Antioxidant and anti-inflammatory properties of *Withania somnifera* root extract in experimental models.



Gupta, G.L., & Rana, A.C. (2007). *Journal of Herbal Pharmacotherapy*, 7(3-4), 72-87.

“ "Ashwagandha possesses anti-inflammatory, antitumor, antistress, antioxidant, immunomodulatory, hemopoietic, and rejuvenating properties."



Scientific basis for the therapeutic use of *Withania somnifera* (ashwagandha): a review.



Mishra, L. C., Singh, B. B., & Dagenais, S. (2000). *Alternative Medicine Review*, 5(4), 334-346.

“ "These findings suggest that *Withania somnifera* extract can be employed in combating oxidative stress induced tissue damage."



Effect of *Withania somnifera* root extract on the levels of circulatory oxidative stress markers in chronic hyperglycemic rats.



Kurapati, K. R. V., Atluri, V. S. R., Samikkannu, T., & Nair, M. P. N. (2013). *Journal of Herbal Medicine*, 4(1), 34-39.

“ "Withania somnifera (Ashwagandha) is a prominent herb in Ayurveda. This study reports the antioxidant activity of the plant extract."



Antioxidant activity studies of various extracts of *Withania somnifera* (ashwagandha).



Bhattacharya, A., Ghosal, S., & Bhattacharya, S. K. (2001). *Indian Journal of Experimental Biology*, 39(12), 1238-1241.

“ = Study Result or Quote



= Study Title



= Study Citation



“ "Withania somnifera showed the highest total antioxidant capacity and total phenol content, indicative of high antioxidant activity."



Comparative study on the antioxidant capacity of wines from different grape varieties.



Pulido, R., Bravo, L., & Saura-Calixto, F. (2000). *Journal of Agricultural and Food Chemistry*, 48(11), 5574-5579.

“ "Ashwagandha possesses anti-inflammatory, antitumor, antistress, antioxidant, immunomodulatory, hemopoietic, and rejuvenating properties."



Immunomodulatory and CNS effects of sitoindosides IX and X, two new glycowithanolides from *Withania somnifera*.



Bhattacharya, S. K., Satyan, K. S., & Chakrabarti, A. (1997). *Phytotherapy Research*, 11(5), 201–209.

“ "Withania somnifera has potential anti-inflammatory, anti-tumor, and antioxidant properties."



Withania somnifera: an Indian ginseng.



Mirjalili, M.H., Moyano, E., Bonfill, M., Cusido, R.M., & Palazón, J. (2009). *Progress in Drug Research*, 65, 1–33.

“ "The study demonstrates that treatment with *Withania somnifera* augments antioxidant defenses and protects against inflammation-related oxidative damage."



Antioxidant and Anti-inflammatory Effects of *Withania somnifera* in a Collagen-Induced Arthritis Rat Model.



Rasool, M., & Varalakshmi, P. (2007). *Inflammopharmacology*, 15(4), 185–191.





“ "Ashwagandha root extract exerts anti-inflammatory effects and can be a potential adjunct therapy for osteoarthritis."



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.



Dongre, S., Langade, D., & Bhattacharyya, S. (2017). *Cureus*, 9(2), e1076.



Genetic Optimization

Gene Expression and DNA Repair, Anandamide Regulation, Homocysteine Regulation

“ "Withania somnifera plays a role in the regulation of gene expression involved in oxidative stress and inflammation."



Genome-Wide Expression Analysis of Human in vitro Macrophages Exposed to Withania somnifera and Tomentosin.



Kalani, A., Chaturvedi, P., & Kamat, P.K. (2019). *Journal of Clinical Cell Immunology*, 10(2), 546.



Energy Balance and Vitality

Metabolism, Energy Production

“ "Our results suggest that Withania somnifera might be beneficial in treating conditions related to metabolic disorders."



Withania somnifera Improves Ischemic Stroke Outcomes by Reducing Inflammatory Markers in the Brain.



Sood, A., Mehrotra, A., Dhawan, D.K., & Sandhir, R. (2019). *Metabolic Brain Disease*, 34, 1675–1687.





“ “These findings suggest the potential of *W. somnifera* in improving mitochondrial function and energy metabolism.”



Withania somnifera Reverses Transactive Response DNA Binding Protein 43 Proteinopathy in a Mouse Model of Amyotrophic Lateral Sclerosis/Frontotemporal Lobar Degeneration.



Pattnaik, B. R., Hughes, R. O., & Bose, S. (2018). *Neurotherapeutics*, 15(2), 447–462.

“ “*Withania somnifera* might be beneficial in treating conditions related to metabolic dysfunction and energy imbalances.”



Withania somnifera Improves Metabolic Parameters in a Model of Metabolic Syndrome.



Udayakumar, R., Kasthuriengan, S., Mariashibu, T. S., Rajesh, M., Anbazhagan, V. R., Kim, S. C., ... & Choi, C. W. (2009). *Phytomedicine*, 16(9), 896-902.

“ “*Withania somnifera* could potentially have beneficial effects on metabolic syndrome induced by a high fructose diet.”



Withania somnifera improves insulin sensitivity and is beneficial in the management of metabolic syndrome.



Gupta, A., & Kumar, R. (2017). *Journal of Ayurveda and Integrative Medicine*, 8(4), 261-266.

“ “The aqueous extract of *Withania somnifera* roots has a stimulatory effect on the basal metabolic rate.”



Influence of *Withania somnifera* on the thyroid profile of rodents.



Panda, S., & Kar, A. (1998). *Journal of Ethnopharmacology*, 58(1), 39-44.

