PERSPECTIVES

Ashwa.30: A Bioactive-Optimized Ashwagandha Extract for Clinically Validated Low-Dose Efficacy

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ABSTRACT

Ashwa.30 is a clinically validated, dual-standardized extract of *Withania somnifera* developed using Bioactive Optimization Technology (B.O.T.). Unlike conventional high-dose ashwagandha products, Ashwa.30 achieves efficacy at a low 30 mg/day dosage through a synergistic combination of withanolides and a proprietary ATP-active fraction. Preclinical and clinical studies demonstrate significant improvements in endurance, stress resilience, and overall well-being. This manuscript summarizes the unique scientific rationale, development process, mechanisms of action, and formulation advantages of Ashwa.30, making it a next-generation solution for integrative and functional health applications. (*Altern Ther Health Med.* 2025;31(5):10-13).

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INTRODUCTION

Ashwagandha (*Withania somnifera*) is an important medicinal plant that has been used in Ayurvedic and indigenous medicine for over 3000 years. Ashwagandha is one of the most revered adaptogens in Ayurvedic medicine, traditionally used for physical and mental well-being. Adaptogens are a class of naturally occurring substances, primarily derived from plants, that enhance the body's nonspecific resistance to physical, chemical, and biological stressors. They help maintain physiological homeostasis by modulating the hypothalamic–pituitary–adrenal (HPA) axis and other stress response systems, without causing significant disturbances to normal biological functions. Adaptogens support increased energy production, improved mental and physical performance, and reduced fatigue under conditions of stress.[1]

In Ayurveda it is classified as a rasayana- Path of essence, 'Rasa' meaning essence 'ayna' meaning path.[2] With growing global awareness of Ayurveda and the adaptogen category, consumer demand for clinically supported and safe natural remedies is rapidly increasing. One of the prevailing unmet needs in the nutraceutical and dietary supplement space is the demand for formulations that deliver clinically meaningful outcomes at low daily doses. Consumers increasingly seek products that are convenient, easy to comply with, and compatible with modern lifestyle preferences—such as single-serving formats, combination products, and novel delivery systems like gummies, beverages, or sachets. However, many existing botanical supplements, including ashwagandha-based formulations, require high daily doses, ranging from 300 mg to 1000 mg, to achieve desired effects. These high required doses present challenges in terms of pill burden, taste masking, formulation constraints, and consumer adherence, especially in multi-ingredient blends.

There remains a significant gap for standardized extracts that offer bioefficacy at substantially lower doses without relying on artificial bioenhancers or synthetic additives. Moreover, consistent batch-to-batch performance, clean-label composition, and regulatory compliance are additional expectations from both consumers and formulators.

In this context, Ashwa.30 has emerged as a novel, bioactive-optimized ashwagandha extract designed to deliver efficacy at a significantly lower dose than conventional products.

METHODS & RESULTS

Innovation through Bioactive Optimization Technology

Ashwa.30 was developed using Bioactive Optimization Technology (B.O.T.), an integrated scientific platform that combines phytochemistry knowledge with biological studies. The innovation behind B.O.T. lies in its ability to identify and optimize specific bioactive fractions of the plant for targeted health outcomes. In contrast to conventional ashwagandha extracts that rely solely on withanolide content, Ashwa.30 is standardized to 2 key fractions: withanolides and a proprietary ATP-active fraction. Through a dual-standardization process, Ashwa.30 delivers a robust adaptogenic effect with clinical efficacy at 30 mg/day without relying on bioavailability enhancers or synthetic additives.

Scientific rationale for low-dose efficacy

Orthogonal array design is a new class of experimental design that was first introduced by Xu et al.[3] Numerous studies have been published in the chemical and engineering field for both 2-level factorial designs and orthogonal arrays. However, limited research has been done on the application of these arrays in the biological and medical fields.[4] Application of orthogonal array design to study ashwagandha was introduced for the first time in the current study. To identify the bioactive fractions responsible for the enhanced efficacy of *W. somnifera* at a low dose, a systematic extraction and evaluation approach was used. The process began with the successive extraction of *W. somnifera* root using solvents of increasing polarity: a nonpolar solvent, a medium-polar solvent such as ethyl acetate or ethanol, and a polar solvent such as water. This process resulted in the isolation of 3 distinct fractions, designated as Extract A, Extract B, and Extract C.

To evaluate the relative bioactivity and potential synergistic effects of these fractions, a Taguchi L9 orthogonal array design was used. This design allowed for the systematic assessment of multiple variables, including fraction combinations and dosage levels, in relevant biological models. The analysis revealed that Extract A and Extract C, either independently or in combination, demonstrated superior biological efficacy in terms of stress resilience and endurance.

Subsequently, Extract A and Extract C were subjected to L9 orthogonal array optimization to determine the interactive effects between the 2 fractions and to identify the primary contributors to the observed bioactivity. The results clearly indicated that Extract A played a dominant role in driving the efficacy, although synergistic enhancement was noted when combined with Extract C. This finding guided the formulation of an optimized extract that delivered both antistress and endurance-enhancing effects at significantly lower doses compared with conventional ashwagandha extracts.

In addition to the mathematical modeling, extensive phytochemical and biological investigations were conducted to profile the active constituents of each extract and refine the composition. This integrated approach of bioactivity-guided fractionation, orthogonal experimental design, and multiparametric optimization was instrumental in the development of a clinically efficacious low-dose extract, later standardized and commercialized as Ashwa.30 that works at a 30-mg dose.

Unique attributes of Ashwa.30 among ashwagandha extracts

Ashwa.30 demonstrates several key differentiators when compared with other commercially available *W. somnifera* extracts. These differences span the part of the plant used,

daily dosage, composition, standardization practices, and mechanism of action.

While many ashwagandha extracts claim root origin, several products are, in fact, derived from both root and leaf (aerial) parts. In contrast, Ashwa.30 is a 100% root-derived extract, adhering strictly to Ayurvedic principles. Notably, traditional Ayurvedic systems emphasize the exclusive use of the root for internal consumption, and there is no documented historical evidence supporting the safe or efficacious use of the leaves or other aerial parts for therapeutic purposes.[5] In addition, the parts other than roots are considered novel, and the manufacturer should prove their safety through a wide range of toxicological tests.[6]

In terms of dosage, most root-only extracts are standardized to daily doses ranging from 120 mg to 600 mg. Products delivering efficacy at lower doses (<300 mg) often achieve this through the incorporation of bioavailability enhancers or via advanced delivery systems. In contrast, Ashwa.30 achieves its clinical efficacy at a remarkably low dosage of 30 mg/day without the use of any bioavailability enhancers. Instead, its potency is attributed to a unique dual-standardization approach—targeting both withanolides and a novel ATP-active fraction—offering direct support to both stress modulation and energy metabolism pathways. This mechanistic innovation distinguishes Ashwa.30 from other formulations that rely primarily on boosting systemic absorption.

Furthermore, Ashwa.30 is produced using a green extraction process involving ethanol and water, both of which are widely recognized as safe and sustainable solvents in nutraceutical manufacturing. In contrast, other extraction processes use solvents such as n-butanol or milk, which are either not generally recognized as safe or lack widespread regulatory acceptance for botanical extraction in dietary supplement applications.

The withanolide standardization of various extracts ranges from 2% to 10%. A recent analysis by Zellner et al[7] found that many commercial ashwagandha products deviated from their label claims of withanolide content. Such discrepancies compromise both safety and efficacy. Of the analyzed products, 5 products were based on ashwagandha root powder. Using high-performance liquid chromatography coupled to drift-tube ion-mobility quadrupole time-of-flight mass spectrometry, 19 withanolides and withanosides were tentatively identified. Comparing the quantitative analysis with the product labels showed that the percentage of withanolides and withanosides deviated from the stated specifications by at least a factor of 2 and at most a factor of 35.

Such discrepancies are not observed with Ashwa.30, as the quantification of withanolides is performed using high-performance liquid chromatography—a universally accepted method. This analytical approach has been validated across multiple batches, ensuring precise standardization and consistent biological efficacy by maintaining uniform levels of active constituents from batch to batch.

Application of molecular docking and transcriptomics in nutraceutical development and elucidating mechanisms of action

Molecular docking is a computational method used to predict interactions between various molecules, such as proteins and ligands, by modeling and analyzing these interactions. Molecular docking aims to understand and predict how molecules interact, thereby aiding in drug design, drug discovery, and understanding the molecular mechanisms involved in biological processes.[8]

Complementing molecular docking, predictive transcriptomics serves as a powerful tool for profiling gene expression changes in response to specific dietary or nutraceutical interventions. By capturing alterations in RNA transcripts under defined nutritional states, transcriptomic analysis provides a comprehensive view of cellular responses and metabolic adaptations.[9] In the development of Ashwa.30, both molecular docking and transcriptomic techniques were used to characterize the functional contributions of withanolides and ATP-active fractions, guiding the intelligent combination of bioactives for optimal stress and endurance benefits at low doses. In addition, the aforesaid techniques also helped in elucidating the mechanisms of action.

Molecular docking studies revealed that withanolides primarily engage with receptor binding sites within the hypothalamic-pituitary-adrenal axis, mediating stress adaptation through neuroendocrine modulation. In parallel, the ATP-active fraction influences genes associated with oxidative phosphorylation, organelle biogenesis, and energy metabolism, pointing to its role in mitochondrial support and physical endurance.

Pathway enrichment analysis demonstrated that both withanolides and ATP-active components contribute to cortisol regulation through distinct mechanisms, highlighting their complementary and synergistic actions. These insights not only support the clinical outcomes observed in trials but also advance the understanding of how adaptogenic botanicals like Ashwagandha can be standardized for targeted health effects.

PRECLINICAL & CLINICAL VALIDATIONS

Preclinical evidence of endurance support from ATP-active fraction

A treadmill-based endurance study conducted in Swiss albino mice provided further support for the performance-enhancing effects of Ashwa.30. The study compared 2 formulations—one containing withanolides and the other containing the ATP-active fraction—administered at 6 mg/kg for 3 days. Both formulations exhibited significant improvements in endurance over the vehicle control; however, the ATP-active fraction resulted in a 1.79-fold increase in endurance time and a 335-m improvement in distance traveled. In comparison, the withanolide group showed a 1.42-fold increase in endurance and a 182-m improvement in distance traveled. These results indicate that the ATP-active fraction may be up to 80% more effective than withanolides alone in supporting physical endurance.

Clinical validation and low-dose efficacy

Clinical studies conducted with Ashwa.30 have reinforced its efficacy at a low 30-mg daily dose. In a human trial assessing cardiorespiratory fitness, Ashwa.30 supplementation led to a 10% improvement in VO_{2max} over placebo, compared with other ashwagandha extracts, which typically yield a either similar or lesser efficacy at a very high dose. Participants also demonstrated improved fatigue scores, lower post-exercise lactic acid levels, and reduced creatine kinase—indicators of reduced muscle stress and enhanced recovery. Clinical study 2, investigating stress response showed that Ashwa.30 reduced salivary cortisol levels within 7 days under acute stress conditions, further confirming its adaptogenic potential.

These findings validate the clinical effectiveness of Ashwa.30 at a fraction of the dose used in standard ashwagandha extracts and highlight the importance of the ATP-active fraction in producing these outcomes. Unlike many commercial formulations that achieve low-dose efficacy through bioavailability enhancers or synthetic additives, Ashwa.30 relies solely on its phytochemical synergy and biological optimization for its activity.

Formulation versatility and global regulatory readiness

Ashwa.30's low-dose, high-efficacy profile makes it highly adaptable across various product formats, including capsules, tablets, gummies, powders, and functional beverages. Its mild taste and water dispersibility further enhance its applicability in complex multi-ingredient formulations. This versatility is particularly valuable in modern product development, for which innovation, palatability, and consumer compliance are paramount.

Ashwa.30 is being positioned for full regulatory compliance. In the United States, the product is undergoing self-affirmed GRAS (generally recognized as safe) status with U.S. Food and Drug Administration notification and is expected to be certified by the World Anti-Doping Agency for sports use. Regulatory submissions are also underway in Canada, the European Union, Australia Therapeutic Goods Administration (TGA), South Korea, and Japan, aligning with Natural Remedies' commitment to quality, transparency, and international standards.

CONCLUSION

Ashwa.30 represents a transformative advancement in the field of adaptogenic supplementation. By integrating traditional Ayurvedic principles with modern scientific methodologies—including bioactive optimization, systems biology, and validated clinical research—Ashwa.30 achieves potent therapeutic benefits at an unprecedented low dose. Its dual-standardization to both withanolides and the ATP-active fraction not only ensures a broader spectrum of physiological support but also establishes a new benchmark for efficacy, safety, and formulation versatility in the ashwagandha category. For health care professionals and formulators seeking a next-generation botanical ingredient, Ashwa.30 offers a clinically backed, scientifically sophisticated solution for stress, endurance, and overall well-being.

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About Natural Remedies: With a history dating back to 1950, Natural Remedies is an internationally recognized botanical health care company focused on combining traditional herbal wisdom with modern science. The company develops clinically supported, high-quality botanical branded ingredients used in health and wellness products around the world. Its team of more than 45 scientists has published more than 230 research papers in peer-reviewed journals and contributed to global standards in herbal medicine. Natural Remedies is committed to safety, sustainability, and innovation across its entire supply chain, and all ingredients are certified kosher and halal. X: https://x.com/hhp_nr Facebook: https://www.facebook.com/profile.php?id=61561338291426 Instagram: https://www.instagram.com/natural_remedies_human_health LinkedIn: https://www.linkedin.com/in/dr-suresh-l-6233717/ Website: https://naturalremedieshumanhealth.com

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