

# Adaptogenic Botanicals that Modulate the Neuroendocrine Stress Response, Nourish Vitality & Enhance Resilience

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## Discussion

### STRESS, ADAPTOGENS AND HEALTH

Good health can be measured by our ability to adapt to the constant changes of life. Stress is a fact of nature as we are in constant interaction with self, others and environment. Adaptive energy refers to the ability of the organism to adapt. Allostasis, the adaptive response of our body's internal systems to seen and unseen factors, is the constant adjusting of our internal functions to maintain homeostasis and health. It is an ongoing process of achieving stability through change.

When our stress load exceeds the body's ability to adapt, this is known as allostatic overload. With prolonged stress, whether real or perceptual, the physiology remains on constant alert due to overactivity of the arousal systems. This leads to depletion of vital energy reserves with concomitant fatigue and a host of other issues.

Ancient medicines, such as Ayurvedic and Chinese, along with the more modern Vitalist herbal tradition, recognize that there is a vital life force or energy that drives the neuroendocrine and other systems of the body. In these medical traditions, specific herbs are classified and used according to their ability to nourish and support the vital life force in its specific manifestations, in relation to organ systems and functions. Through enhancing the vital life force, we address the actual root cause of dysfunction, support adaptive response and restore normal function. Elite herbs long-revered in these traditions provide nourishing, supportive and restorative benefits.

In modern times, we describe these elite herbs as "adaptogenic" due to their ability to act in a non-specific manner to strengthen physiological adaptation, support the body's natural processes and aid organ systems to work optimally, without side effects.

The simplest definition of an adaptogen is any agent that increases non-specific resistance of an organism to stress and other environmental influences. Adaptogens act in a

restorative manner to revitalize exhausted organ and energy systems. They support normalizing of the entire system through optimizing recovery time during periods of stress, increasing efficiency of response and bringing all the systems into harmony.

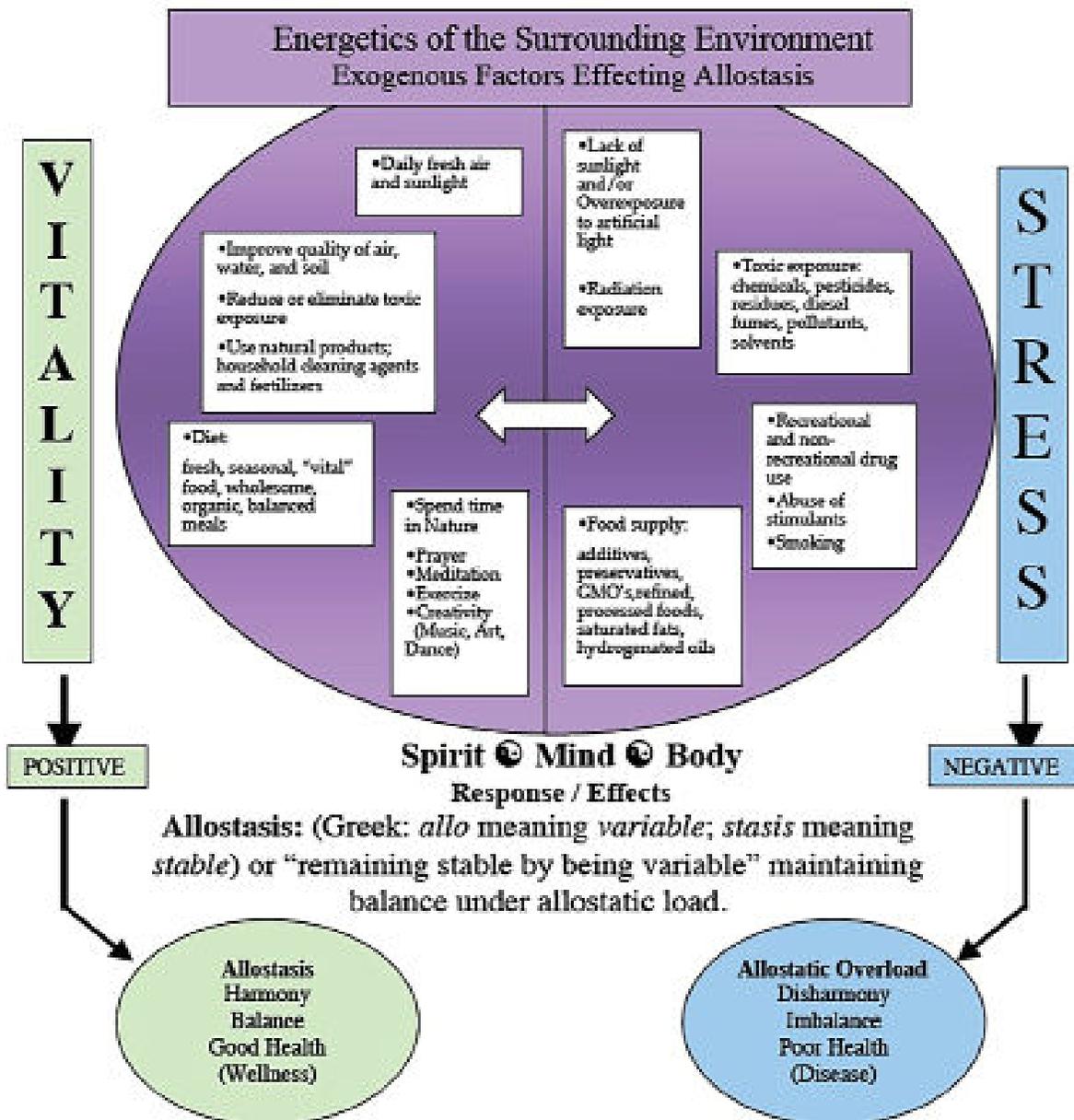
Adaptogenic botanicals support, restore and enhance the foundational energy systems of the body to support allostasis and prevent allostatic overload. These elite herbs are the optimal choice for deep restorative work at all systemic levels: cellular, tissue, organ, immune, energetic and neuroendocrine.

#### *Adaptogens:*

- non-specific, normalizing action
- support physiological adaptation
- enhance the body's normal processes
- nourish vital life force
- promote optimal function
- no side effects or toxicity
- normalize hypo- and hyper-conditions
- modulate neuroendocrine function

### NEUROENDOCRINE SYSTEM & ANABOLIC METABOLISM

Adaptogens encourage healthy adaptive response to stress primarily through modulation of neuroendocrine function. The production and relay of neurotransmitters and hormones is in a continual state of flux, adjusting basic cellular and



physiological functions to support us in our daily activities and responses to real or perceived stressors. The complex process of primary and secondary reactions and feedback mechanisms in the nervous, endocrine and immune systems is collectively referred to as the “stress response”. Hormones regulated by the neuroendocrine system have important nutritive and integrative roles in maintaining cellular, organ and tissue health.

Our neuroendocrine system has a major impact on health, aging and disease. At the core of the neuroendocrine system is the HPA axis, which modulates multiple processes. In humans, the glucocorticoid cortisol is one of the key players that regulates the degree and duration of HPA axis activation during

stress. Chronic elevation of cortisol, along with other factors, adversely affects health. Since adaptogens help normalize hypo- or hyper- conditions they are of primary importance in calming the stress response and normalizing function.

Biological aging and disease are associated with functional decline and attendant deficits at the cellular, tissue, organ and system levels of the body. Aging can be viewed as a process of shifting from a primarily anabolic metabolic balance to increasing levels of catabolic activity. This metabolic shift accounts for wear and tear, enzyme depletion, free radical expression, oxidative stress and other models of aging including expression of genetic errors.

Our lifestyle, aging and stress responses influence the balance of anabolic and catabolic activity. This influences our endocrine function, immunity, cell proliferation, bioenergetics and cell communication along with mood and behavior. Aging is associated with reduced anabolic hormone activity. The ratio of serum testosterone to cortisol is often used as an anabolic/catabolic index.

Adaptogenic botanicals nourish the vital life force, improve energy transfer and balance and harmonize anabolic/catabolic balance. They reduce the negative effects of stress by restoring energetic and physiological function. This promotes healing from injury or illness, maximizes health and vitality and improves mental and physical performance.

Adaptogenic herbs combined with synergistic botanicals high in micronutrients help support anabolic metabolism, hormonal balance and healthy neuroendocrine response. Together, these herbal medicines provide a diverse array of compounds such as isoflavones, flavonoids, saponins and sterols that normalize neuroendocrine health, modulate inflammation, support vital life force and possess restorative ability.

#### *HPA axis dysfunction can lead to:*

- dysregulation of catecholamines (fight or flight stress hormones)
- dysregulation of glucocorticoids from the adrenals
- dysregulation of cytokines (disrupted immune response)
- atrophy of nerve cells in the amygdala and hippocampus of the brain
- bone mineral loss
- high lipids
- abdominal obesity
- chronic fatigue
- mild depression and anxiety
- poor sleep patterns
- altered cognitive performance
- decreased sexual behavior

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## Key Botanicals that Nourish Endocrine Function



### **Eleuthero** (*Eleutherococcus senticosus*)

Eleuthero is the herb researched by Russian scientist Dr. Nikolai Lazarev in the late 1940s whose unique qualities led him to coin the term “adaptogen”. Later, Israel I. Brekhman, MD used the remarkable properties of Eleuthero to define the parameters of “adaptogenic” herbs.

A member of the Araliaceae family, Eleuthero was initially marketed as “Siberian Ginseng” although it is only a distant relative of the Ginseng family. One of Eleuthero’s bioactive compounds, Eleutheroside B, is the key compound that plays a significant role in the anti-stress and anabolic actions of Eleuthero.<sup>1-4</sup>

As the premier adaptogenic botanical, Eleuthero is highly effective in improving the body’s adaptive capacity to respond in a variety of situations from athletic performance to stress and illness. It helps combat adverse effects of sleep-deprivation.<sup>5</sup> It is found to support adaptation to climate<sup>6</sup> and to high altitude.<sup>7</sup>

Eleuthero enhances physical energy and endurance, mental acuity, and capacity for work and exercise with long-

term benefits. In exercise, it improves oxygen uptake<sup>8,9</sup> – enabling longer workouts, increased stamina and quicker recovery time especially in performance athletes. Eleuthero demonstrates anabolic activity<sup>1-4,8</sup> and normalizes function more than any other adaptogenic agent.<sup>10,11</sup> It increases biological resistance and normalizes individual physiological responses and enhances vital energy systems. Eleuthero supports and optimizes endocrine and adrenal gland function when the body is challenged by stress. It is also found to normalize blood sugar levels.<sup>12,13</sup>



### **Schisandra** (*Schisandra chinensis*)

Formulas that combine Schisandra seed and fruit extract are ideal because the seed extract contains powerful adaptogenic compounds including higher amounts of lignin compounds called schisandrins.<sup>14,15</sup> Most of the Russian research on Schisandra as an adaptogen has been done on the seed extract. Schisandra seed is widely used for the treatment of stress-induced nervous system exhaustion and fatigue, insomnia, weakness, depression, forgetfulness, vision problems, diarrhea and chemical toxicity.<sup>14,15</sup> The seed extract paired with the fruit extract offers

the unique property of stimulating the central nervous system without causing over-excitation. This supports a balanced, strong and enduring sense of mental and physical vitality.

The orange-red Schisandra berry has a long history of medicinal and food use in China, Japan, Korea, Tibet and Russia. Throughout time, hunters in the wilds of Siberia have used the dried berries chewed or prepared as a tea, to provide energy, stave off exhaustion and improve night vision during long trips. Known as “Five Flavor Fruit” in Chinese medicine, it is considered a tonic that benefits all five energetic/organ systems according to Chinese medical principles, where each flavor relates to a specific energetic system. However, Schisandra was used particularly to nourish the lungs, support liver function and benefit the eyes.

In modern research, it is found to improve visual acuity, increase adaptation to darkness and widen the borders of the visual field.<sup>16</sup> In multiple studies, Schisandra is reported to increase mitochondrial glutathione redox status<sup>17-19</sup>, which suggests a role in preventing oxidative stress. It is known to protect the liver and DNA from damage due to chemicals such as carbon tetrachloride.<sup>17,18</sup>



#### Rhodiola (*Rhodiola rosea*)

The active constituents unique to *Rhodiola rosea* thought to be responsible for its adaptogenic qualities are two glycosides, particularly a group called “rosavins.”<sup>20</sup> Other compounds in Rhodiola include flavonoids, volatile essential oils and triterpenes. It also includes 17 amino acids along with vitamins, minerals and trace elements.<sup>21-24</sup>

Known as Golden or Arctic Root, this perennial plant has red, pink or yellow flowers and grows prolifically in the colder north of Russia. In Siberian mountain villages, Rhodiola roots were given to couples about to be married as a sign of good health and fertility. Chinese emperors sent expeditions to Siberia to bring back the “golden roots” prized for medicinal use. Rhodiola is used in Tibetan medicine to promote circulation and prevent hypertension.

Rhodiola is valued for its ability to enhance mental and physical performance and stamina.<sup>25</sup> It nourishes the central nervous system, improves resistance to stress and helps eliminate fatigue. It is beneficial to prevent altitude sickness.

Rhodiola benefits concentration, focus, memory and learning capacity.<sup>26-29</sup> It demonstrates ability to reduce stress-induced depression and decrease levels of anxiety. It harmonizes the neuroendocrine system and improves the HPA axis response to stress.

Studies find that extracts of Rhodiola stimulate ATP

(adenine triphosphate) and synthesis of creatine phosphate and glycogen in the muscles and liver along with anabolic activity in muscles such as protein synthesis.<sup>30</sup> Rhodiola is cardioprotective and helps normalize the heart rate after intense exercise. Some studies indicate it can normalize a system in conditions of stress and arrhythmia.<sup>31-34</sup>



#### American Ginseng (*Panax quinquefolius*)

American Ginseng is more prized by many than Asian Ginseng because of its deeply “Yin”-nourishing properties, which allows for deep, restorative tonification without any heating effects such as happens with “Yang” tonics (including Red and Korean Ginseng). American Ginseng is particularly known as a lung tonic.

The Eclectic physicians were a branch of American medicine in the latter half of the 19th and first half of the 20th centuries. They used botanical remedies extensively and valued American Ginseng as a tonic to support energy, stamina and endurance.

American Ginseng nourishes those with conditions of weakness as it supports energy, stamina and stability of the nervous system. Traditionally, it was found helpful for nervous dyspepsia (weak stomach) and for those with mental exhaustion from overwork. Found to modulate the HPA axis, it increases endurance and reduces fatigue after exercise.<sup>35</sup> A large amount of research supports American Ginseng’s traditional use as a nervine and tonic as it shows multiple beneficial neurocognitive effects. Extracts are found to be neurotrophic, neuroregenerative and neuroprotective.<sup>35</sup>

Constituents include ginsenosides which are triterpene saponin glycosides in ratios different than those found in Asian Ginsengs. American Ginseng also contains polysaccharides, proteins and proteoglycans.<sup>35</sup>

Studies demonstrate a positive influence on the cardiovascular system with antioxidant effects. Extracts are found to exert both antioxidant and anti-inflammatory activity. American Ginseng benefits the immune system and promotes immune cytokine production.<sup>36-39</sup> Use of a polysaccharide-rice extract of American Ginseng was found to support respiratory health and recovery from respiratory infection.<sup>35</sup> It demonstrates cytoprotective and hepatoprotective capacity.<sup>35</sup> Extracts of American Ginseng are found to normalize blood sugar<sup>35</sup> and to protect against renal damage in diabetics.<sup>40</sup> Studies find it reduces inflammation in the colon and may exert a beneficial influence on the colon microbiome.<sup>41</sup>



#### Ashwagandha (*Withania somnifera*)

Ashwagandha or Winter Cherry, is a woody shrub in the Solanaceae family that grows in diverse areas

including Africa, India and the Mediterranean.

This powerful herb has been revered in Ayurvedic medicine for over five thousand years. Often called Indian Ginseng, it belongs to an elite class of Ayurvedic restorative, tonic herbs, known as Rasayana. The name Ashwagandha means “the smell of a horse,” referring to the strong smell of the root. It also refers to the traditional belief that Ashwagandha root confers the vigor, virility and strength of a stallion.

The botanical name “*somnifera*” means “restful sleep”. Botanicals classified as tonics in many traditional medicines most often act through what we would refer to in modern times as modulation of the HPA axis. Their tonic action is due to their normalizing action, particularly on the neuroendocrine system, rather than a stimulant effect. Stimulants overtax the nervous system while adaptogenic tonics such as Ashwagandha work by nourishing and thus enhancing relaxation of the nervous system. In Ayurvedic and Chinese medicine, it is understood that when our nervous system is functioning optimally, we can relax deeply and enjoy a truly restful sleep. Thus, this simple term, “restful sleep” implies an overall image of vitality that describes the healthy cycle of vigorous activity and restorative sleep. Ashwagandha is known for its neurocognitive benefits including nervous system restoration.<sup>42-44</sup>

Studies demonstrate that Ashwagandha benefits cognition and offers significant brain- and neuro-protective qualities. One study found 80% reduction in cell degeneration in the brain of stressed animals.<sup>45</sup> Another discussed the ability of an isolate of Ashwagandha to positively influence regeneration of neurons and synapses in damaged neurons and neural circuits – vital components of the nervous system and brain.<sup>46,47</sup> Ashwagandha may be protective of brain cells and support healthy brain function in degenerative brain conditions.<sup>48</sup> It is found to increase acetylcholine receptor activity, which may partially explain its ability to enhance cognition and memory.<sup>49</sup>

Historically used to enhance longevity and protect from disease, this ancient herb possesses significant adaptogenic activity, enhancing restorative response to stress in all systems of the body. Ashwagandha supports healthy anabolic activity and nourishes those in a weakened physical or mental condition. Chinese medicine reveres it as a Kidney Yang (metabolically-warming) tonic to promote longevity and health. Modern studies find that Ashwagandha helps to normalize glucose levels, supports healthy aging and enhances male sexual function.<sup>50,51</sup>

Ashwagandha is found to exert antioxidant and anti-inflammatory activity. One study reports that an extract of Ashwagandha significantly suppresses production of proinflammatory cytokines in both normal individuals and in

rheumatoid arthritis patients.<sup>52</sup>

### Reishi Mushroom (*Ganoderma lucidum*)



Known as Ling Zhi in Chinese medicine, Reishi is revered as a longevity herb and elixir of immortality. This glossy, deep reddish-brown, woody mushroom is a popular motif in Taoist and Chinese art, often portrayed in the hands of Chinese sages.

“Ling Zhi” can be translated as “Plant of Immortality”, “Herb of Spiritual Potency”, “Spirit Plant of Longevity” or variations on these themes, indicating the powerful medicine Reishi is considered to be. Used in Chinese medicine for over 2000 years particularly to nourish the deep reserve energy of the Kidneys, Reishi supports the root (Kidney energy) of the person and their overall well-being.

With active constituents that include polysaccharides, triterpenoids and plant sterols, Reishi modulates immune system function.<sup>53,54</sup> Since its effects are nourishing and restorative, it modulates homeostasis and supports the body’s ability to respond well to stress. It enhances vital energy and restorative sleep. Reishi is excellent for those who are depleted or in conditions of ongoing stress.

It exerts a wide range of activity including anti-inflammatory, antioxidant effects and helps protect cells from oxidative damage.<sup>54</sup> Clinically, it is found to support eye moisture and overall well-being in those who spend their working days in front of a computer screen.

### Cordyceps (*Cordyceps sinensis*)



Known in China as “winter worm summer grass” or the “caterpillar mushroom,” Cordyceps is a parasitic fungus that traditionally grows on the larvae of caterpillars and other hosts that provide a growth medium for the mycelia. Today, most Cordyceps is made from cultured mycelia. The Cordyceps in Vital Adapt<sup>®</sup> is the CS-4 strain cultured on organic brown rice, offering superior quality and therapeutic activity. The CS-4 strain is the most widely-researched and highly-regarded.

Naturally found in the highlands, above 10,000 feet elevation in China, Tibet and Nepal, it has been highly prized in these areas for centuries. Li Chih Shen, a renowned sixteenth century herbalist, praised Cordyceps for its ability to invigorate and tone the entire body. Chinese herbalists revered it as a respiratory tonic. At the same time it deeply nourishes the deep reserve (Kidney) energy that supports healthy lung function and overall vitality and stamina.

Cordyceps first gained international attention when it was discovered that Chinese Olympic athletes included Cordyceps

as part of their daily herbal training formula. Studies confirm that Cordyceps increases endurance, vigor and athletic performance.<sup>55,56</sup>

Recognized for its liver- and kidney-protective qualities, Cordyceps is reported to be especially beneficial for those with chronic kidney disease.<sup>57-60</sup>

### Synergistic, Flavonoid-Rich Herbs



Stress-resistance capacity is a hallmark of longevity and survival throughout the plant and animal kingdoms. Plants naturally produce many biochemical compounds that support their health and survival. These same compounds provide micronutrients found to be beneficial for humans. Plants and herbs provide an abundance of plant micronutrients known as flavonoids, which support health from the cellular level up through the whole system. Polyphenols and their subgroup, flavonoids, are widely studied and known to support health and help prevent degenerative disease when included as part of our regular diet. Herbs with high polyphenols content are currently of great interest because they are known to offer profound antioxidant and anti-inflammatory activity.<sup>61</sup>

A special group of such herbs is included in Vital Adapt<sup>®</sup>. Green tea, Tumeric, Ginger, Grape seed and skin, Elderberry and Hawthorn collectively contain a wide variety of polyphenols including catechins, curcuminoids, resveratrol, quercetin, and OPCs (oligomeric proanthocyanidins) along with other beneficial compounds.

These highly-valued traditional herbs provide a protective role in helping prevent diseases associated with inflammation and oxidative stress. They help maintain and support healthy cellular function while providing protection against environmental stressors. These flavonoid-rich herbs work together synergistically and support the primary actions of the adaptogenic herbs in the formula.

*For more information on any of the ingredients listed here, including extensive research or individual monographs compiled by Donnie Yance, please email [info@naturaedu.com](mailto:info@naturaedu.com).*

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