

Adaptogens: Nature's Stress Relievers

The Adrenal Glands

The adrenal glands are small triangular-shaped glands that sit on top of the kidneys, and they are responsible for producing a number of hormones that regulate various functions in the body. These include the "stress" hormones cortisol (or hydrocortisone) and adrenaline (or epinephrine). Cortisol is released into the blood in response to stress and acts to increase blood sugar levels, suppress the immune system and aids in fat, carbohydrate and protein metabolism. Adrenaline is also released as part of the body's "fight-or-flight" response, and acts to increase blood pressure, constrict blood vessels and dilate air passages. Basically, the purpose of cortisol and adrenaline is to provide the body with a quick burst of energy to cope with stressful conditions. However, after this response the body is meant to be returned to normal conditions. In our high-stress culture, stress is often chronic, leading to prolonged presence of stress hormones, especially cortisol, in the system. This can have negative effects on the body and can lead to health problems. Some natural substances, called adaptogens, can help restore balance in the body, thereby helping to prevent overstimulation of the adrenal glands.

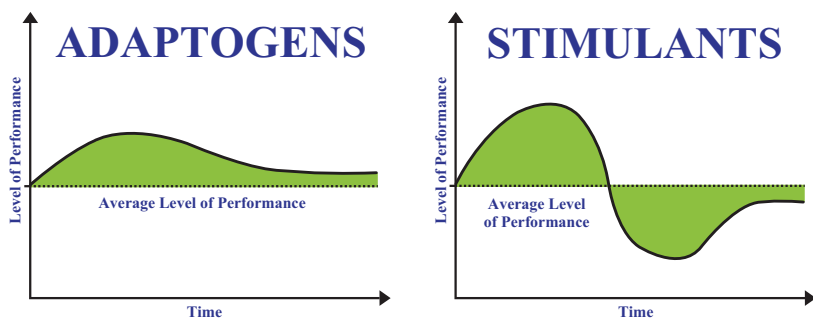


Figure 1. Differences between Adaptogens and Stimulants

What are Adaptogens?

The term "adaptogen" was originally coined in 1947 by a pharmacologist named N.V. Lazarov.¹ As originally defined, an adaptogen was a substance that had to:

1. Show some nonspecific effect, such as increasing resistance to physically, chemically, or biologically harmful agents or factors.
2. Have a normalizing influence on a pathologic state
3. Not disturb body function at a normal level.

Adaptogens are essentially naturally occurring metabolic regulators that increase an organism's ability to adapt to and avoid damage from changing environmental factors or stress.¹ Early research on adaptogens began in Russia during the Second World War, and was part of an effort to find substances that would help to increase the ability of soldiers to cope with situations of stress.²

How do Adaptogens Work?

One feature that is important to understand about adaptogens is that they function in a manner that is distinctly different from stimulants. Both stimulants and adaptogens produce an increase in performance, however, with stimulants this effect is short-lived and is followed by a period of decreased performance. Adaptogens, on the other hand, produce a gentle and sustained performance increase, without the subsequent crash. Stimulants are also associated with energy depletion, insomnia and negative side-effects that are not encountered with adaptogens (see Figure 1).^{1,2}

Differences Between Stimulants and Adaptogens		
	Stimulants	Adaptogens
Recovery after exhaustive physical loading	Low	High
Energy depletion	Yes	No
Performance under stress	Decrease	Increase
Survival under stress	Decrease	Increase
Quality of arousal	Poor	Good
Insomnia	Yes	No
Side effects	Yes	No
DNA/RNA and protein synthesis	Decrease	Increase

In general, adaptogens work by helping increase the capacity of the body's stress system to maintain homeostasis (a state of balanced equilibrium) during exposure to stressful conditions. Adaptogens accomplish this by helping the body to remain in a Stage of Resistance (see page 4 and 5), which is often achieved by their ability to normalize levels of stress hormones, thereby preventing an over reactive or chronic response to stressful stimuli. These stimuli can include physical stressors, like cold and physical exertion, or psychological stressors, like work and family situations.

Chronic or excessive stress responses can lead to tissue or organ damage, anxiety, exhaustion, increased blood pressure, a suppressed immune response, improper digestion and even some chronic diseases.² By helping the body to reduce the reactivity of the stress response system, adaptogens play a protective role in the body.

Effective Botanical Adaptogens

Many natural substances have been shown to have adaptogenic properties. Some of these include Licorice, Ashwagandha, Siberian ginseng and Rhodiola.

Glycyrrhiza glabra - Licorice



Licorice (*Glycyrrhiza glabra*) is the source of the phytochemical glycyrrhizin, which is partly converted in the intestine to the more active glycyrrhetic acid. Both glycyrrhizin and glycyrrhetic acid can activate the receptors for key adrenal hormones (mineralocorticoids and glucocorticoids) involved in mobilizing your energy reserves in response to stress. Glycyrrhetic acid also helps your body to keep these hormones in their more active forms, by inhibiting the enzymes (5-beta-reductase and 11-beta-hydroxysteroid dehydrogenase) that degrade adrenal hormones into less active forms.³

Some individuals cannot take licorice supplements containing glycyrrhizin, because this molecule can sometimes act to increase blood pressure. It is therefore advised that individuals with hypertension not take licorice containing glycyrrhizin. Deglycyrrhizinated licorice supplements are available; and while these are highly effective for the treatment of ulcers and heartburn, these would not have an adaptogenic effect, since the glycyrrhizin itself is the active ingredient in this situation. For the majority of individuals, 200 mg of glycyrrhizin from licorice is a safe and effective dose to help maximize the availability of the adrenal hormones necessary for the adaptogenic response.⁴ Licorice extracts are even monographed by Health Canada's Natural Health Product Directorate (NHPD), further attesting to their safety and efficacy.⁵

Withania somnifera - Ashwagandha



Ashwagandha (*Withania somnifera*) is also known as "Indian Ginseng" although it is not actually a type of ginseng at all. This plant has a long history of traditional use in Ayurvedic medicine, and has been used for centuries to help calm the nervous system. Ashwagandha has been shown in animal and human clinical trials to be helpful for anxiety, inflammation and neurological disorders.⁶ Ashwagandha is a well known adaptogen, and provides powerful support against overwhelming stress. Ashwagandha appears to work by helping to calm the nervous system, reducing its overactive response to stress or alarm. For example, when there is an excess of a certain hormone, like stress-hormones, the active components of ashwagandha can occupy cell membrane receptor sites so the actual hormone cannot attach and exert its effect. In this fashion, the herb can regulate the stress response.⁶

Several studies show that Ashwagandha is superior to Panax ginseng at helping animals and humans to cope with stressful situations, such as forced swimming in cold water.⁷ Ashwagandha has broader effects as well. In one double-blind trial, 101 healthy men aged 50 to 59 were evaluated for various aging parameters over the course of a year. Increased red blood cell levels, greater libido, and lower erythrocyte sedimentation rate (a measure of chronic inflammation) were observed in the men taking ashwagandha.⁸ Ashwagandha also helps to prevent both over-activation and suppression of the immune system, strengthening the immune system in individuals taking immunosuppressive drugs while also helping to protect the body from chronic inflammation.⁶ Like licorice, ashwagandha is also monographed in Canada by the NHPD.⁹

***Eleutherococcus senticosus* - "Siberian ginseng"**



Eleutherococcus senticosus, or "Siberian ginseng," is another misnomer: like ashwagandha, it is not a ginseng species at all. Despite this, its adaptogenic properties are, if anything, better documented than those of regular Panax ginseng. *Eleutherococcus* also lacks the side effects observed in some users of Panax ginseng, which overexcites some people and can ironically even cause them stress. "Siberian ginseng" also has a more global beneficial effect on the immune system than Panax ginseng, and its phytochemistry - and resulting benefits - is more reliable than its Panax namesake.¹⁰

The adaptogenic effects of *Eleutherococcus* have been clearly demonstrated in both animal and human trials. In animal studies, this herb has been shown to reduce adrenal hypertrophy, to prevent vitamin C depletion in the adrenal glands and to reduce fatigue during stressful conditions.^{11,12} In humans, *Eleutherococcus* has been shown to have anti-stress effects and also helps to reduce chronic fatigue.¹⁰ It has beneficial effects on the immune system as well. Human studies

have demonstrated that *Eleutherococcus* improves some immune system parameters more effectively than Echinacea, and helps to reduce the symptoms of upper respiratory tract infections.^{10,13}

In one clinical study, 45 volunteers received either *Eleutherococcus* or a placebo for 30 days. Before and after supplementation the subjects' stress response was tested. Individuals who took the *Eleutherococcus* supplement showed a 40% reduction in heart-rate in response to a stressor. Furthermore, in women, the supplement reduced blood-pressure increases in response to cognitive tests by 60%.¹⁴ The results of this study clearly demonstrate the ability of *Eleutherococcus* to support the body's ability to cope with stress.

Rhodiola rosea



Rhodiola rosea is a very well-studied and effective adaptogen. Also known as "Arctic Root" or "Roseroot," *Rhodiola* is an herb with a long history of use in the traditional medicine of Siberia. Its adaptogenic properties have been extensively studied in animals exposed to a wide range of stressors by scientists in the former Soviet Union.¹⁵ Clinical trials in humans have provided further support for the ability of standardized *Rhodiola* extracts to enhance the body's physical and mental work capacity and productivity under conditions of stress. Users find that *Rhodiola* is highly effective at helping with the psychological impact of stress, even as it enhances physical and mental endurance.¹⁵

Standardized *rhodiola* extracts have been studied in numerous groups of individuals that are consistently exposed to high levels of physical or mental stress; these groups include students, military cadets and physicians.^{16,17,18} In one trial, 161 military cadets performing a 24-hour military exercise were randomized to receive either *Rhodiola* supplements or

a dummy pill. It was found that the cadets taking the Rhodiola supplement experienced an anti-fatigue effect, and experienced marginally better performance than they did before the military exercise began! Cadets taking the placebo, on the other hand experienced a 10% reduction in performance.¹⁶

Standardized rhodiola supplements have also been put to the test in physicians during two-week stretches on night duty and in students during final exams. These trials have provided further support for the herb's general anti-fatigue effect, showing that it can help to improve tests of physical fitness, mental fatigue and neuromotor function under stress.^{17,18}

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Rhodiola

- Enables the body to make the best use of its energy
- Enhances physical and mental performance
- Supports a healthy immune system
 - Helps prevent burnout



The Stress Buster