Mushrooms are Adaptogens

Clinical experience has shown that medicinal mushrooms have very complex and versatile modes of action. For the nervous system, they have a stimulating and equally soothing effect. Moreover, the same mushroom can stimulate the immune system, but can also balance an immune system that is overly active - as for instance by allergies and autoimmune diseases. In practice, mushrooms have clearly been shown to regulate our body’s systems and are thus adaptogens. More and more scientific studies are verifying this fascinating mode of action.

What are adaptogens?

As early as in 1947, Russian scientist Dr. Nikolai Lazarev defined adaptogens as follows: A substance that enables the body to overcome various physical, chemical or biological stress factors by developing an unspecific resistance. This allows the organism to adapt to circumstances that involve a high exposure to stress.

In 1968, Israel I. Brekhman and Dr. I. V. Dardymov described the term “adaptogen” in more detail:

1. Adaptogens cause the organism to develop an unspecific response to stress. The body is provided with power to resist or adapt. A reservoir of adaptogenic power is “stored” to be available in situations of acute stress. In contrast to stimulants, the cells’ vital energy is not reduced.

2. Adaptogens have normalising effects on the body - independent of the direction of deviation from the physiological norm. They enhance cellular intelligence, provide strength in presence of diminished functions and suppress excessive functions.

Adaptogens take effect in the body’s regulatory systems such as the hypothalamo-pituitary-adrenal axis (HPA), the sympatho-adrenergic system (sympathetic nervous system and adrenal medulla) and the immune system. Secondly they also influence, e.g. to the liver, the cardio-vascular system, the pancreas and the kidneys.

Substances with adaptogenic properties

Most adaptogens are mushrooms or plants that have managed to adapt to extreme environmental conditions such as cold, high altitude, oxygen deficiency, extreme solar exposure or aridity. Quite frequently they are also roots containing concentrated energy and nutrients gained from years of growth and maturing.

If we look, for instance, at the places in which Cordyceps is found, its powerful adaptogenic properties become obvious. It grows at Himalayan altitudes in an environment of low oxygen, extreme temperature fluctuations and strong solar radiation. However, other medicinal mushrooms also feature ingredients characteristic for adaptogens, such as polysaccharides or triterpenes.
Biochemical substances in adaptogens

Ingredients that have adaptogenic properties:

1. **Polyphenols (flavonoids)**

2. **Terpenes**: the largest group of phytochemicals that enable plants to grow in their environment. Subgroups include triterpenes and saponines, which act similarly to glucocorticoids. They are anti-inflammatory, hepato-protective, regulate the immune system and reinforce the adrenal glands.

3. **Polysaccharides** (specific β-glycans): plants that contain large amounts of polysaccharides regulate the immune system, reinforce the vital energy and are considered Qi tonics (energy sources).

Other ingredients also influence the plant’s or mushroom’s properties by improving the absorption, reducing the toxicity or preventing adverse side effects.

The body’s response to stress

**Stress** is not exclusively connected to difficult or unpleasant situations. It can also occur under positive circumstances. Decisive is how our body reacts to changes in its environment and the resulting disrupted homeostasis.

Chronic stress first begins to affect our body and mind. These impacts may continue long after the stress-triggering moment has passed. Type, intensity and implication of stress factors are very individual. Possible stress factors include viruses, bacteria, chemical substances, noise pollution, extreme weather conditions, allergens, radiation, electromagnetic waves, surgery, pregnancy, birth, trauma, severe health problems, poisoning and strong emotions.

The hypothalamus as our central control unit is responsible for homeostasis. It can respond to stress in two different ways: by deploying the nervous or the endocrine system.

Both result in the release of stress hormones, which triggers the physical stress response. The hypothalamus is activated immediately by stressful experiences.

The stress response follows in two different physiological ways

1. **HNA system** (hypothalamus pituitary adrenal cortex) - the endocrine way. The release of CRH (corticotropin-releasing hormone) is triggered in the hypothalamus, which stimulates the release of ACTH (adrenocorticotropic hormone) in the pituitary gland, which stimulates the production of glucocorticoids - mainly cortisol - in the adrenal cortex. The entire process serves to mobilise energy.

2. **SAS** (sympathoadrenal system): the approach that deploys the nervous system and that is also known as “fight-or-flight response”. In this process the hypothalamus additionally stimulates the production of catecholamines (adrenalin, noradrenalin) in the adrenal cortex through the
sympathetic nervous system.

The hypothalamus and pituitary gland are the interface between the nervous and endocrine systems.

Cortisol is the stress hormone for mobilising energy. In order to flight or fight, the body needs energy. In other words, it needs energy to respond to stressful events. Cortisol causes the release of amino acids stored in muscular proteins. These amino acids are used in the liver to synthesize glucose (gluconeogenesis). The glucose consumption in the other tissue is reduced and the muscles deploy fatty acids to ensure the brain receives a sufficient amount of glucose. Cortisol regulates the blood pressure, cardio-vascular functions and the immune system.

Too much cortisol leads to immune suppressions, anxiety, sleeplessness, hypertension, insulin resistance, overweight, osteoporosis, imbalanced sexual hormones or polycystic ovaries. Cortisol deficiencies can result in depression, sleeplessness, fibromyalgia, hypotension (low blood pressure), CFS, infertility, impotence (men) or the premenstrual syndrome (PMS).

Adrenalin prepares our body for physical effort. It stimulates the heart, increases the blood pressure, constricts smaller vessels, increases the blood supply to muscles and brain and releases sugar stored in the liver.

Noradrenalin increases blood pressure, maintains the blood circulation and transits nerve impulses within the autonomic nervous system (sympathetic and parasympathetic nervous system). The body is thus enabled to fight or to flee, i.e. to respond to a changing environment or to stress.

DHEA (dehydroepiandrosterone) is produced in the adrenal cortex and is an antagonist of cortisol - it prevents the binding of cortisol. Cortisol and DHEA are effective markers for activities of the HPA axis.

Being exposed to stress, the body consumes more energy and can experience exhaustion. In addition, more free radicals are produced. They destroy the mitochondria - and thus the cellular energy management.

We differentiate between stages of alarm, resistance and exhaustion. The alarm stage sets in within the first few minutes or hours after the stress impulse. The SAS and HNA system are being activated to provide the body with energy for higher performance. An excessive activation takes place, which is followed by a resistance phase during which the body adapts to the continuing stress impulse. Through a counter-reaction of the parasympathetic nervous system the excessive activation is reduced, yet it still remains above the healthy norm. In this phase psychosomatic disorders such as asthma, hypertension or ulcers frequently arise. During the exhaustion phase, the body no longer has sufficient energy to adapt and we suffer from fatigue and imbalance in the most varied body systems. Frequently, the outcome is increased proneness to infection, depression, anxiety and early aging. Finally, all systems in the organism can be affected, since they are all controlled by the neuroendocrine system.

How adaptogens work

An imbalanced system is regulated through the hypothalamo-pituitary-adrenal axis (HNA system) and the sympato-adrenergic system (sympathetic nervous system and adrenal medulla).

Adaptogens support the entire endocrine system and in particular reinforce the adrenal cortex. Thus, they counteract the negative side effects of stress - the release of stress hormones is regulated. They enable our body to adapt its response to a changing environment and minimise possible damage from long-term stress reactions. The HNA system is stabilised, which delays or even prevents the exhaustion phase.

Adaptogens help to maintain homeostasis in chronic stress situations and to retain the ability to adapt. This
includes the physiological biorhythm (circadian rhythm), the normal body temperature and the cortisol production.

Adaptogens act prophylactically by increasing the body’s unspecific resistance to various stress factors.

Adaptogens also act anabolically. They protect energy reserves and are thus invigorating. This is of significance for athletes and older people. Moreover, they are highly antioxidant, which decelerates the biological aging process.

Adaptogens work on the cell level, stimulating the mitochondria to produce energy (ATP). ATP is important for physical power and strength.

They also improve the hepatic function. The liver provides glucose for energy production and channels away toxins. In addition, adaptogens regulate the immune system.

Psychoneuroimmunology is concerned with researching the interaction between emotions, the nervous system and immune system. By regulating the neuroendocrine system, adaptogens act on both the body and the mind. They influence the HNA axis and thus the overall biological system.

The health benefits of adaptogens such as Reishi or Cordyceps:

- counteracts adrenal insufficiency caused by chronic stress
- anti-aging effects by delaying physiological aging processes/factors: stress, free radicals, excess cortisol, DHEA deficiency and inflammatory processes are counteracted
- counteracts anxiety and depression by lifting the spirits, reducing stress and invigorating the nerves
- anti-inflammatory and immune system regulating by arthritis
- for high-performance sport: shorter regeneration phases, more stamina, improved pulse rate, supports respiratory and circulatory system
- improves memory capacity since high cortisol levels cause neural cell death, regulates the neurotransmitter value
- strengthens the respiratory tract
for cancer: antioxidant, counteracts stress, regulates the immune system, reduces the adverse side effects of chemo and radiation therapy

strengthens and protects the cardio-vascular system: regulates blood pressure and cholesterol level, counteracts cardiac arrhythmias, and strengthens the myocardium

counteracts indigestion because stress hormones delay digestion processes and affect the intestinal flora

counteract exhaustion: stress exposure causes higher energy consumption

regulates the immune system: small amounts of cortisol stimulate the immune response; large amounts suppress the immune system

protects and strengthens the liver

promotes mental and psychic well-being: brightens mood, soothes the mind

regulates sexual hormones: testosterone, progesterone, oestrogens interact with the HPA axis

counteracts sleeping disorders: stress disrupts the circadian cortisol release; cortisol helps to synchronise activities, and sleeping and eating habits

counteractss overweight: stress frequently tempts to eat excessively; a high cholesterol level causes (particularly abdominal) fat deposits

Source
