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FILE: ▪ Adaptogens: History
▪Adaptogens: Review

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RE: Adaptogens: History and Future Potential

Panossian AG. Adaptogens. *Alternative and Complementary Therapies* 2003 Dec:327-331. Reprinted from Panossian AG. Adaptogens: a historical overview and perspective. *Natural Pharmacy* 2003;7(4):1, 19-20.

The history of adaptogens (see HC 070135.247) may have begun with issuance of an order by the People's Commissars Council of the Union of Soviet Socialist Republics (USSR) in 1943 concerning the goal of finding "tonic substances" for Russian workers and soldiers during World War II. The USSR led the way in research on several herbs which meet at least part of the formal criteria developed to define an adaptogen – a substance that will: 1) show some nonspecific effect, such as increasing physical resistance to stress; 2) have a normalizing effect on a pathological condition regardless of the nature of that condition; and 3) be safe to use, not disturbing normal body functions. Table 1 lists 31 plants often described as adaptogens; of these, the majority of Russian research has been done on eleuthero (Siberian ginseng; *Eleutherococcus senticosus*), rhodiola (*Rhodiola rosea*; see HC 040233.241), schisandra (*Schisandra chinensis*), and white bryony (*Bryonia alba*). These herbs were incorporated into official medical practice in the USSR and produced as standardized extracts in various forms. Having been found quite safe, they are still used in Russia in both self-care and physician-prescribed regimens.

In self-care, Panossian says that adaptogens are used by healthy people in states of fatigue or stress. In sports medicine, they are used to prevent and treat injuries, and in occupational medicine to protect against adverse environmental factors. Also, they are used to treat acute hepatic poisoning, ischemia from oxygen deprivation, and to hasten post-surgical recovery. Adaptogens are used to treat some neurological, emotional, and psychiatric disorders (see HC 060231.247), and are prescribed as adjuvants to other medications in treating tuberculosis and cancer. Evidence suggests that adaptogens are most effective as extracts combining several active substances from a single plant species; however, in Sweden and Denmark, different adaptogenic extracts are used in fixed-ratio combinations.

A substantial number of clinical studies of varying design have found that standardized extracts of eleuthero, rhodiola, and schisandra effectively increase mental and physical work capacity in

situations of fatigue and stress. "Tests involving exposure to cold, heat, altered atmospheric pressure and oxygen content, radiation, toxic substances, starvation, fear, and chronic diseases have shown that the most important feature of adaptogens is an ability to increase resistance to both physical and emotional stress." Panossian writes that another adaptogen, Asian ginseng (*Panax ginseng*), was not found in any of 16 double-blind, randomized, placebo-controlled trials reported in computerized literature databases to exert a "convincingly significant effect...on physical performance, psychomotor performance, cognitive function, immune function, or other specific functions." It would be interesting to discover if other adaptogens can stand up to this degree of rigor.

Adaptogenic preparations may be divided into three groups: 1) those containing phenolic compounds whose structural resemblance to catecholamines suggests an effect on the sympathoadrenal system (SAS), possibly in early stages of the stress response; 2) those containing tetracylic triterpenes which resemble the corticosteroids which inactivate the stress system; or 3) those containing oxylipins, unsaturated trihydroxy or epoxy fatty acids which resemble leukotrines and lipoxines.

Panossian discusses the physiological basis for the action of adaptogens, pointing out that they are quite distinct from central nervous system stimulants. Single-dose administration of adaptogens appears to activate corticosteroid formation and repeated doses to normalize levels of stress hormones. Blood levels of coroticosteroids increase during long-term training or adaptation. A trained organism responds to stress with only a slight increase in hypothalamic-pituitary axis (HPA) activity, as opposed to a pronounced increase in untrained organisms. Both schisandra and white bryony activated formation of nitric oxide and cortisol in trained athletes' plasma, suggesting that they provide adaptation to further physical loading.

While Panossian notes that it is difficult to relate modes of action and pharmacologic activity satisfactorily to adaptogens' various effects, their mechanisms of action appear to be primarily related to effects on the neuroendocrine-immunologic axis which constitutes the stress system. Stress, a defensive response to external factors, stimulates formation of catacholamines, prostaglandins, cytokines, nitric oxide, and platelet activating factor. The "switch-on" mechanism for stress activates the SAS, and over a longer term, the HPA. An opposing "switch-off" system protects cells and organs from overreactions. This system includes antioxidant enzymes such as catalase, glutathione peroxidase, and superoxide dismutase; interleukins which downshift aspects of the immune response; certain corticosteroids and eicosanoids, such as prostaglandin E2; and anti-inflammatory mediators. In conditions of normal homeostasis, "switch-on" and "switch-off" systems are in dynamic balance. Adaptogens may thus be seen as agents that reduce reactivity of the host-defense system to various stressors by helping to restore and maintain normal homeostasis.

— Mariann Garner-Wizard

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