

Siberian Ginseng

According to the American Veterinary Medical Association, the primary responsibility of veterinarians is to protect the health and welfare of animals and people.¹ Protection of animal health is also the first use for which veterinarians pledge their scientific knowledge and skills in the Veterinarian's Oath.² Thus, if a safe, natural substance could help animals stay healthy in the face of stress, strenuous exertion, and exposure to cold, heat, noise, and pathogens, would it not be reasonable and appropriate to consider using it for our patients?

Such a substance may exist: *Eleutherococcus senticosus* (ES), or Siberian ginseng. As the name suggests, ES grows in Siberia but is also indigenous to China, Korea, and Japan. Research has shown that ES may modulate immune function,³ increase exercise capacity, help maintain health during chemotherapy, regulate blood glucose, and defend against stressors (including cold, heat, noise, psychological stress, etc.). It may also have anti-oxidant, anti-cancer, cholesterol-lowering, insulin-regulating, radioprotectant, anti-inflammatory, anti-pyretic, and anti-bacterial activities.^{4 5}

The health benefits of ES have been recognized by Chinese herbalists for over 2000 years.⁶ Ayurvedic medicine (an ancient Hindu healing tradition in India) also recognized the rejuvenating and life-supporting properties of ES.⁷ Its most recent surge in popularity began in the 1950's, when researchers in the Soviet Union searched their country for a *Panax ginseng* substitute, since supplies of *Panax* were dwindling. *Panax ginseng* had become popular for its stimulating and tonifying properties, for which scientists coined the term "adaptogen", which can be defined as "any substance that exerts effects on both sick and healthy individuals by 'correcting' any dysfunction(s) without producing unwanted side effects."^{8 9}

Following the discovery of ES by Soviet researchers, intense research into its health benefits ensued. Since the 1960's, Russian scientists studied thousands

¹ Obtained on 081102 at <http://www.avma.org/care4pets/morewhat.htm> .

² Ibid.

³ Schmolz MW et al. The synthesis of Rantes, G-CSF, IL-4, IL-5, IL-6, IL-12, IL-13 in human whole-blood cultures is modulated by an extract from *Eleutherococcus senticosus* L. roots. *Phytotherapy Research*. 2001; 15:268-270.

⁴ Davydov M and Krikorian AD. *Eleutherococcus senticosus* (Rupr. & Maxim.) Maxim. (Araliaceae) as an adaptogen: a closer look. *Journal of Ethnopharmacology* 2000; 72:345-393.

⁵ Szolomicki S et al. The influence of active components of *Eleutherococcus senticosus* on cellular defence and physical fitness in man. *Phytotherapy Research*. 2000; 14:30-35.

⁶ Foster S. *Siberian Ginseng, Eleutherococcus senticosus*. American Botanical Council. Botanical Series No. 302, 7 pages. Date unknown.

⁷ Rege NN et al. Adaptogenic properties of six *rasayana* herbs used in Ayurvedic medicine. *Phytotherapy Research*. 1999; 13:275-291.

⁸ Foster, S. Op. cit.

⁹ Davydov M. Op. cit.

of normal and stressed human subjects, measuring their adaptogenic responses to adverse conditions such as heat, noise, strenuous exertion, and motion.¹⁰ They found improvements in mental alertness, work output, work quality, auditory disturbances, and athletic performance, with virtually no adverse effects.¹¹ Ingestion of ES extracts then increased tremendously among soldiers, factory workers, cosmonauts, athletes, deep sea divers, mine and mountain rescue workers, and explorers.¹² Over 13,000 workers at the Volga Automobile Plant took daily doses of ES, and their overall disease incidence and absence from work fell by one-third.¹³ By 1976, 3 million people in Russia were consuming ES, and demand for an ES-containing cola-like drink (“Bodrust”, meaning “vigor”) outpaced supply.¹⁴

Clearly, the health benefits of ES look promising, and some veterinarians are already using ES in their practices. Others are waiting for randomized, controlled clinical trials to show safety and efficacy, before suggesting it to their clients. While pure ES has few to no adverse effects in humans, full delineation of the side-effects profile for veterinary patients remains to be done. Preliminary investigations of the effects of ES show anabolic effects in chickens, calves, baby rabbits, piglets, mink, and rats, leading to protein-based weight gain.¹⁵ Research is also sorely needed to clarify dosage requirements for nearly all botanical medicines sold for animals today. Guidelines to questions of “How much?” and “How long?” appear in several books on veterinary botanical medicine, and roughly correspond to relative weight.¹⁶

Another problem facing veterinarians interested in trying ES for their patients may be finding compounds of high quality, purity, and reliable biologic activity. Lack of regulation of botanical compounds has led to problems of contamination with other plant species, impure ingredients, and variability in quality. Although a recent study of twenty-five commercial ginseng preparations from the genera *Panax* and *Eleutherococcus* from health food stores in the United States were all correctly labeled, there was “considerable” variability in the concentrations of marker compounds (ginsenosides and eleutherosides, respectively).¹⁷ Even reports on side effects of botanical compounds warrant close scrutiny. For

¹⁰ Foster S. Op. cit.

¹¹ Foster S. Op. cit.

¹² Foster S. Op. cit.

¹³ Barenboim GM. *Eleutherococcus: Strategy of use and new fundamental data*. Medexport, 1981. Cited in information handout provided by Botanicare Natural Products on “Botanicare standardised extract of *Eleutherococcus*, found in the Herb Research Foundation Information Packet on Siberian Ginseng. Boulder: Herb Research Foundation.

¹⁴ Lee G. Smart Drug Update: *Eleutherococcus senticosus* (Part 1). *Smart Drug News*. 1997; 5(10):1-7.

¹⁵ Lee G. Smart Drug Update: *Eleutherococcus senticosus* (Part 2). *Smart Drug News*. 1997; 5(10):7-12.

¹⁶ Wulff-Tilford ML and Tilford G. *All You Ever Wanted to Know About Herbs for Pets*. Irvine: Bowtie Press, 1999. Pp. 16-17.

¹⁷ Harkey MR et al. Variability in commercial ginseng products: an analysis of 25 preparations. *Am J Clin Nutr*. 2001; 73:1101-1106.

example, case reports attributed both elevated serum digoxin levels¹⁸ and maternal-neonatal androgenization¹⁹ to ES, though these were apparently cases of botanical misidentification. That is, later laboratory investigation showed that disreputable manufacturers had substituted *Periploca sepium* (Chinese silk vine) for ES. The substitute contains cardiac glycosides (which ES does not) and endocrine-stimulating steroids^{20 21 22}

Clarification of the mechanisms of action must also be obtained, before some veterinarians will feel uncomfortable suggesting a natural remedy for their patients. That is, telling clients that they are seeking to “benefit Qi” or “treat Yang Deficiency” is simply unacceptable for many medical practitioners.²³ Even the term “adaptogen” is vague and does little to explain the actual chemical properties of ES. Of over 1500 papers on ES, most are written in Russian. These studies often lack rigorous experimental design and must be replicated.²⁴ Furthermore, not all studies have shown positive effects when the benefits claimed in uncontrolled trials were then subjected to more rigorous testing.²⁵

Nevertheless, in light of all the evidence currently available, it does appear that ES can benefit health and reduce the maladaptive effects of stress. ES and other adaptogens appear to work by altering the body’s reaction to stress, in that they affect the output of physiologic substances the body releases in response to stress: nitric oxide,²⁶ platelet activating factor, catecholamines, cortisol, and prostaglandin E₂.²⁷ By creating a balance between “switch on” and “switch off” responses to stressors, the organism maintains homeostasis. For example, stress markers that *activate* the psychoneuroimmunologic system of the body include: nitric oxide, catecholamines, leukotrienes, cytokines, and more. These substances mobilize bodily resources to defend against stress and constitute a “switch-on” mechanism. *Deactivating* stress markers include corticosteroids and prostaglandin E₂, which act as endogenous mediators of intercellular

¹⁸ McRae S. Elevated serum digoxin levels in a patient taking digoxin and Siberian ginseng. *Can Med Assoc J.* 1996; 155:293-5.

¹⁹ Koren G et al. Maternal ginseng use associated with neonatal androgenization. *JAMA.* 1990; 264:2866.

²⁰ Awang DVC. Siberian ginseng toxicity may be case of mistaken identity. [Letter]. *Can Med Assoc J.* 1996; 155(9):1237.

²¹ Awang DVC. Maternal use of ginseng and neonatal androgenization [comment]. *JAMA* 1991; 266:363.

²² Waller DP et al. Lack of androgenicity of Siberian ginseng [Letter]. *JAMA.* 1992; 267(17):2329.

²³ Foster S. Op. cit.

²⁴ Bucci LR. Selected herbals and human exercise performance. *Am J Clin Nutr.* 2000; 72(suppl):624S-636S.

²⁵ Eschbach LC et al. The effect of Siberian ginseng (*Eleutherococcus senticosus*) on substrate utilization and performance during prolonged cycling. *International Journal of Sport Nutrition and Exercise Metabolism.* 2000; 10:444-451.

²⁶ Panossian AG et al. Effects of heavy physical exercise and adaptogens on nitric oxide content in human saliva. *Phytomedicine.* 1999; 6(1):17-26.

²⁷ Panossian A et al. Plant adaptogens III. Earlier and more recent aspects and concepts on their mode of action. *Phytomedicine.* 1999; 6(4):287-300.

communication and protect the organism and its cells from overreacting to the stress in a “switch-off” fashion. By increasing the body’s ability to react to higher levels of stress, but by also preventing hyper-reactivity that might be damaging, plant adaptogens can help soften the impact of stressors on the body and reduce the damage that might otherwise disturb the physiologic homeostasis so important to overall health.²⁸ By identifying “stress-markers” and measurement of their levels within the system, adaptogenic botanical medicines that alter stress-marker output can then be more accurately studied.²⁹ Researchers will be able to better understand how an individual responds to stress, and how to best support and promote the health of that individual using natural and safe substances.

²⁸ Ibid.

²⁹ Panossian A et al. Plant adaptogens III. Earlier and more recent aspects and concepts on their mode of action. *Phytomedicine*. 1999; 6(4):287-300.