

Panax ginseng

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The herbal remedies referred to as “ginseng” are derived from the roots of several plants. One of the most commonly used and researched of the ginsengs is *Panax ginseng*, also called Asian or Korean ginseng. The main active components of *Panax ginseng* are ginsenosides, which have been shown to have a variety of beneficial effects, including anti-inflammatory, antioxidant, and anticancer effects. Results of clinical research studies demonstrate that *Panax ginseng* may improve psychologic function, immune function, and conditions associated with diabetes. Overall, *Panax ginseng* appears to be well tolerated, although caution is advised about concomitant use with some pharmaceuticals, such as warfarin, oral hypoglycemic agents, insulin, and phenelzine. *Panax ginseng* does not appear to enhance physical performance. Products with a standardized ginsenoside concentration are available. (*Am Fam Physician* 2003;68:1539-42. Copyright© 2003 American Academy of Family Physicians.)

Herbal remedies known as “ginseng” are based on the roots of several distinct species of plants, mainly Korean or Asian ginseng (*Panax ginseng*), Siberian ginseng (*Eleutherococcus senticosus*), and American ginseng (*Panax quinquefolius*). All of these species are in the Araliaceae plant family, but each has its own specific effects on the body.

Ginseng products are popularly referred to as “tonics,” a term that has been replaced by “adaptogens” in much of the alternative medicine literature. The term “adaptogen” connotes an agent that purportedly “increases resistance to physical, chemical, and biological stress and builds up general vitality, including the physical and mental capacity for work.”^{1(p236)} Over-the-counter *Panax ginseng* products include Celestial Seasonings Ginseng, Centrum Herbs Ginseng, Korean Ginseng Extract from Nature’s Way, Nature Made’s Chinese Red *Panax Ginseng*, Pharmaton’s Ginsana, and PhytoPharmica’s Ginseng Phytosome.

Panax ginseng is one of the most commonly used and highly researched species of ginseng. This species, which is native to China, Korea, and Russia, has been an important herbal remedy in traditional Chinese medicine for thousands of years, where it has been used primarily as a treatment for weakness and fatigue.²

Pharmacology

The main active agents in *Panax ginseng* are ginsenosides, which are triterpene saponins. The majority of published research on the medicinal activity of *Panax ginseng* has focused on ginsenosides.³ These are the compounds to which some ginseng products are now standardized.

Research reviews^{2,4} postulate that extracts of *Panax ginseng* affect the hypothalamus-pituitary-adrenal axis and the immune system, which could account for many of the documented effects. Animal models and in vitro studies mentioned in these reviews^{2,4} indicate that *Panax ginseng* enhances phagocytosis, natural killer cell activity, and the production of interferon; improves physical and mental performance in mice and rats; causes vasodilation; increases resistance to exogenous stress factors; and affects hypoglycemic activity.

Efficacy

Panax ginseng is used primarily to improve psychologic function, exercise performance, immune function, and conditions associated with diabetes (*Table 1*). Traditional Chinese medicine and many current research studies⁵⁻⁸ often use products that combine ginseng with other herbal medicines or vitamins. Because of the use of combination products and the limitations of some studies on ginseng (e.g., poor

See page 1461 for definitions of strength-of-evidence levels.

TABLE 1

Key Points About Panax ginseng

Efficacy	Psychologic functioning: effective; conflicting evidence Physical performance: ineffective Immune system: effective Diabetes: modest effect; evidence limited
Adverse effects	Nausea, diarrhea, euphoria, insomnia, headaches, hypertension, hypotension, mastalgia, vaginal bleeding, blood pressure abnormalities
Interactions	Caution advised about concomitant use with phenelzine (Nardil), warfarin (Coumadin), oral hypoglycemics, insulin, or caffeine, and about use in patients with hypertension or bleeding
Dosage	Standardized extract: 200 mg per day Dry root (tea form or chewed): 0.5 to 2 g per day
Cost	\$15 to \$20 for a one-month supply at a dosage of 200 mg per day
Bottom line	A safe, well-tolerated herbal medicine that may be used for a variety of medical conditions

methodologic quality, research focusing on healthy volunteers, small sample size, unstandardized ginseng preparations, varying doses), it is difficult to draw conclusions about some of the clinical effects of ginseng. Many research trials have been performed on the standardized Panax ginseng extract Ginsana (G115).

EFFECTS ON PSYCHOLOGIC FUNCTION

Trials investigating the effects of Panax ginseng on various psychologic parameters have shown positive effects, no effects, or both. In one study⁹ of 112 healthy volunteers older than 40 years, the administration of 400 mg per day of the standardized ginseng product Gerimax for eight weeks resulted in better and faster simple reactions and abstract thinking, but no change in concentration, memory, or subjective experience.

The results of two small studies,^{10,11} each including about 30 young, healthy volunteers who received 200 mg of G115 daily for eight

weeks, showed improvement in certain psychomotor functions (i.e., better attention, processing, and auditory reaction time), social functioning, and mental health. However, some of the effects present at the fourth week disappeared by the eighth week.¹¹

A study of 384 postmenopausal women who were randomized to receive placebo or ginseng for 16 weeks showed improvements in three subsets of a Psychological General Well-Being index.¹² [Evidence level A, randomized controlled trial (RCT)] In addition, a small study⁷ of 20 healthy young volunteers who received a single 400-mg dose of ginseng found improvement in cognitive performance, secondary memory performance, speed of performing memory tasks, and accuracy of attentional tasks. However, another study¹³ showed no effect on positive affect, negative affect, or total mood disturbance in 83 young healthy volunteers who took 200 to 400 mg per day of G115 for eight weeks.

EFFECTS ON PHYSICAL PERFORMANCE

Most of the clinical studies investigating the value of Panax ginseng in enhancing physical performance have shown no clinical effect.¹⁴ One study¹⁵ on the use of 200 mg per day of G115 in 19 healthy adult women showed no change in physical work performance, energy metabolic responses, or oxygen uptake.

Similarly, a study of 31 healthy men who took 200 or 400 mg of G115 daily for eight weeks found no change in physiologic or psychologic responses to submaximal or maximal exercise.¹⁶ [Evidence level B, lower quality RCT] In another study,¹⁷ a different product standardized to 7 percent ginsenosides and administered at 200 mg per day was given to 28 healthy young adults for 21 days. No ergogenic effects were demonstrated, including no change in maximal oxygen consumption, exercise time, workload, plasma lactate level, hematocrit, or heart rate.

EFFECTS ON IMMUNE SYSTEM

A study¹⁸ of 227 healthy volunteers demonstrated that daily administration of 100 mg of

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G115 for 12 weeks enhanced the efficacy of polyvalent influenza vaccine. The patients who received ginseng had a lower incidence of influenza and colds, higher antibody titers, and higher natural killer cell activity levels. Another study¹⁹ in 60 healthy volunteers showed enhanced chemotaxis, phagocytosis, increased total lymphocyte count, and increased numbers of T helper cells in those who received G115 in a dosage of 100 mg twice daily for eight weeks. In a study of 75 patients with acute exacerbation of chronic bronchitis who were treated with antibiotics or antibiotics plus ginseng, those in the ginseng group showed faster bacterial clearance.²⁰

EFFECTS ON DIABETES

The effects of Panax ginseng, given in a dosage of 100 or 200 mg per day for eight weeks, were studied in 36 patients with newly diagnosed non-insulin-dependent diabetes.²¹ The study showed improved fasting blood glucose levels, elevated mood, and improved psychophysical performance on a numbered diagram test. The 200-mg dose also resulted in improved hemoglobin A_{1C} values.

ADDITIONAL USES

In 45 patients with erectile dysfunction, use of ginseng improved erectile function, sexual desire, and intercourse satisfaction.²²

Panax ginseng also appears to have anti-cancer effects. In a prospective cohort study²³ of 4,364 persons older than 40 years, the risk of cancer was shown to be lower in those who used ginseng (relative risk: 0.40).

Adverse Effects, Drug Interactions, and Contraindications

Interpretation of documented adverse effects and drug interactions can be difficult because of the variety of available ginseng formulations, and because the exact amount of ginseng in these products may not be identified.

Panax ginseng generally is well tolerated, and its adverse effects are mild and re-

versible.²⁴ Associated adverse effects include nausea, diarrhea, euphoria, insomnia, headaches, hypertension, hypotension, mastalgia, and vaginal bleeding.^{4,24,25}

Panax ginseng may interact with caffeine to cause hypertension, and it may lower blood alcohol concentrations. It also may decrease the effectiveness of warfarin (Coumadin). Concomitant use of Panax ginseng and the monoamine oxidase inhibitor phenelzine (Nardil) may result in manic-like symptoms.^{4,23}

Contraindications to the use of Panax ginseng include high blood pressure, acute asthma, acute infections, and nose bleeds or excessive menstruation. These effects appear to occur primarily with high dosages or prolonged use.²⁶

Ginseng also causes hypoglycemic activity, and caution should be exercised in using ginseng products in patients with diabetes because of possible interactions with oral hypoglycemic agents and insulin. One source² recommends avoiding the use of ginseng products in children and in women who are pregnant or lactating, until more rigorous studies prove safety in these groups.

Dosage

Most published research studies have used a standardized Panax ginseng extract in a dosage of 200 mg per day. Other sources^{2,23,27} recommend 0.5 to 2 g of dry root per day on a short-term basis, with the ginseng taken in tea form or chewed. Capsule formulas are generally given in a dosage of 100 to 600 mg per day, usually in divided doses.

Standardization is to the ginsenoside content, which is usually recommended to be 1.5 to 7 percent.² According to one source,²⁸ 4 percent is an important standard level.

Ginseng is commonly taken for long periods.^{1,29} One source^{1(p239)} recommends a two-week ginseng-free period every two to three weeks for some persons.

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