

Herbs to Enhance Energy and Performance

Key Points at a Glance

Rhodiola

traditionally used as a tonic, to improve mental and physical performance and immune function

defined as an adaptogen by Russian scientists

clinically demonstrated to:

- increase mental and physical performance in workers and healthy volunteers, including during stress
- relieve fatigue
- possibly support athletes
- help schizophrenic patients
- improve sexual function in men
- improve symptoms in depression and generalised anxiety disorder

contains rosavins and salidroside (important for authenticity and quality)

Korean Ginseng

traditionally used as a tonic and adaptogen clinically demonstrated to:

- improve performance, general well being and mental health
- benefit postmenopausal women, possibly via an antistress effect
- improve vitality and muscle strength in the elderly
- improve sexual function in men
- possibly improve male infertility

epidemiological studies show improved quality of life and survival rates for cancer patients

contains ginsenosides

- ratio of ginsenoside Rg₁ to ginsenoside Rb₁ should be greater than 0.5 (important for quality)

Rhodiola

Rhodiola rosea (*Sedum roseum*) belongs to the Crassulaceae family and is found in Arctic regions including Alaska, north-eastern Siberia and northern parts of Europe. The botanical name alludes to the rose-like odour of the rootstock when freshly cut. The root of Rhodiola (also known as arctic root or golden root) has been used in the traditional medicine of many countries including Russia, Scandinavia and Middle Asia. Since 1969 Rhodiola has been included in official Russian medicine. It is regarded as a tonic and stimulant and used to increase physical endurance, attention span, memory and work productivity, resistance to high altitude sickness. Other uses include to treat fatigue, depression, anaemia, impotence, infections (including colds and influenza), cancer, nervous system disorders and headache and for longevity and to enhance fertility.^{1,2,3}

Key Constituents

Phenylpropanoids such as rosarin, rosavin and rosin are typical components of *Rhodiola rosea* root. Other constituents include salidroside (a hydroxyphenethyl glucoside) and the monoterpene rosiridin. Commercial extracts are often standardised for the content of salidroside and rosavin, although they are not unique to

Rhodiola rosea. Salidroside in particular is present in a variety of species, including some outside the Rhodiola genus. The term rosavins is used to include rosavin, rosin and rosarin, and Rhodiola extracts are best standardised for both rosavins and salidroside. The naturally occurring ratio of rosavins to salidroside in authentic root is approximately 3:1. Other species which also contain salidroside but not rosavins have been substituted for *R. rosea*. Analysis of commercial samples of Rhodiola available in the United States in 2000 found that although all of the samples contained *R. rosea* extracts, the amounts of phenylpropanoid constituents were lower than in the reference plant material. The daily dose of phenylpropanoid constituents varied from 0.78 to 6.87 mg, based on the manufacturers recommended tablet dosage.^{1,2}

Tonic & Adaptogenic Activity

Following extensive pharmacological studies, Russian scientists defined Rhodiola as an adaptogen in 1968.⁴

In clinical studies administration of Rhodiola: increased **physical and mental efficiency**;⁴ produced significant improvement in physical fitness, mental fatigue and neuromotoric tests (maze test measuring accuracy versus speed) in **students** during

an examination period (dosage probably suboptimal: extract* equivalent to about 0.4 g dried root containing 3 mg/day rosavins and 0.8 mg/day salidroside for 20 days); average exam marks from the examination immediately after the end of the study were higher in the Rhodiola group;^{5**}

produced significant improvement in mental performance and **reduced general fatigue** in young healthy doctors during night duty (extract* equivalent to about 0.7 g/day dried root for 14 days),^{3**} as a single dose, produced a significant antifatigue effect (improved mental work quantity and quality per unit time) in young cadets (extract* equivalent to about 1.5 g dried root);⁶

relieved symptoms of asthenia (fatigue, decline in work capacity, sleeplessness, poor appetite, irritability, headache);²

improved the amount and quality of intellectual work and decreased the error rate in proofreading tests (especially over an 8-hour period);²

increased physical work capacity, coordination, **general well being** and decreased mental fatigue and situational anxiety;²

had no effect on cognitive function: reaction time, limb speed and sustained attention; in healthy volunteers (dosage: extract containing 6 mg/day rosavins and 2 mg/day salidroside for 4 weeks – this is a fairly low dose);⁷

increased physical work capacity and reduced recovery time between periods of high-intensity exercise in healthy volunteers and athletes;²

improved coordination, strength, endurance and cardiovascular measures in athletes;²

inhibited exercise-induced inflammatory markers in the blood of healthy volunteers undergoing exhausting physical exercise;⁸

as a single dose, improved exercise capacity (measured by oxygen consumption) in healthy volunteers but no effect was observed when taken for 4 weeks (dosage: extract containing 6 mg/day rosavins and 2 mg/day salidroside – this is a fairly low dose);⁷

had no effect on exercise performance or recovery in trained men (dosage: extract containing 30-45 mg/day rosavins for 4 days – quality of extract was poorly defined);⁹

improved mental activity in 25- to 35-year-old students, and decreased the quality of intellectual work in 14- to 16-year-old students;¹⁰

provided some benefit in **schizophrenic patients** whose anticholinergic medications had failed to relieve Parkinson's disease induced by antipsychotic medications;²

did not influence nausea-induced stress hormone release or prevent motion sickness;¹¹

improved sexual function in men with erectile dysfunction and/or premature ejaculation.²

* dried herb equivalent provided on the likely ratio of this extract

** these trials were designed with low dose regimens

Nervous System

Standardised Rhodiola extract for 6 weeks was beneficial for **mild to moderate depression** in a placebo-controlled trial. Overall depression, as well as insomnia, emotional instability and somatisation (physical symptoms caused by mental or emotional factors) improved significantly after treatment with Rhodiola.¹²

Preliminary results indicate standardised Rhodiola extract improves symptoms in patients with **generalised anxiety disorder**.¹³

Korean Ginseng

Panax ginseng root has been used in traditional Chinese medicine (TCM) to reinforce the *vital energy* and *spleen*, to calm the nerves and for the treatment of lethargy, palpitations with anxiety, forgetfulness and insomnia as well as general weakness with irritability.^{14,15} In western herbal medicine, Korean Ginseng is used as an adaptogen and tonic indicated for physical or mental exhaustion and stress.^{16,17} Since 1951 Korean Ginseng preparations have been officially approved for therapeutic use in the former Soviet Union. It is regarded as an adaptogen.¹⁸

Key Constituents

The ginsenosides (which are triterpene saponins of the dammarane type) are key constituents of Korean Ginseng root.¹⁶ But the total level of ginsenosides is not the sole determinant of quality (the leaves and root hairs actually contain more total ginsenosides than the roots). The activity of Korean Ginseng must be attributable to the particular combination of ginsenosides found in the main and lateral roots. (The ginsenosides can be divided into two classes – the protopanaxatriol class consisting mainly of Rg₁, Rg₂, Rf and Re and the protopanaxadiol class consisting mainly of Rc, Rd, Rb₁ and Rb₂.) In particular, the ratio of ginsenoside Rg₁ to ginsenoside Rb₁ being greater than 0.5 is accepted as the marker of quality. However, it is also likely that other components found in the main root contribute significantly to the therapeutic activity.¹⁹ Two forms of the root are available in commerce, red Ginseng where the root is steamed before drying and white Ginseng which is dried by normal processes. Both forms contain the ginsenosides described above.¹⁷

An analytical study published in 2001 suggested that ginseng products (*P. ginseng*, *P. notoginseng*, *P. quinquefolius* and *Eleutherococcus senticosus*) for sale in the United States exhibited variability in concentration of marker compounds. Levels of marker compounds differed significantly from labelled amounts and there was also

significant product-to-product variability.²⁰ Testing of a selection of ginseng products available in the US market in 2006 found that nearly 30% did not contain the claimed and/or the minimum expected amount of ginsenosides. (The minimum expected amount for total ginsenosides is 3% for *Panax ginseng* root extracts.) One product also failed due to lead contamination. (Heavy metals such as lead are toxic.)²¹

Tonic & Adaptogenic Activity

Clinical studies tend to support the hypothesis that the tonic and adaptogenic activity of Korean Ginseng improves human performance and well being, although some trials have produced negative results.^{16,19} Despite this, the balance of evidence is that Korean Ginseng does **increase physical performance** and recovery (at least in male athletes) although well-designed trials involving larger numbers of participants are required to conclusively resolve this issue. Results to 1997 suggest that Korean Ginseng is of limited value for psychomotor performance.¹⁹ Most studies suffered from poor methodology, lack of controls, and no standardisation of the ginseng extracts used.²² A dose-response and duration effect is apparent, which accounts for most of the variation in clinical trial results. Properly controlled studies exhibiting statistically significant improvements in physical or psychomotor performance almost invariably used higher doses (usually standardised to ginsenoside content equivalent to ≥ 2 g/day dried root), longer duration of study (≥ 8 weeks) and larger subject numbers, indicating greater statistical power. Korean Ginseng may exert greater benefits for untrained or older volunteers.²³

In trials not covered in these reviews and excluding effects on strenuous exercise, Korean Ginseng:

improved psychological test scores in **postmenopausal women** with symptoms of fatigue, insomnia and depression, compared to those without symptoms; improvement was at least partially due to an antistress effect, demonstrated by a decrease in the cortisol/DHEA ratio;²⁴

improved general well being in symptomatic postmenopausal women; the beneficial effect was most likely not mediated by hormone replacement-like effects;²⁵

improved aspects of **mental health** and social functioning in healthy volunteers compared to placebo, although the improvement reduced after 4 weeks;²⁶

improved vitality and muscle strength in healthy elderly volunteers (dosage: extract containing 96 mg/day of ginsenosides).²⁷

An epidemiological study in China found that compared to female breast cancer patients who never used ginseng, regular users had a significantly **reduced risk of death**. Patients provided information about their use of white or

red Korean ginseng, American ginseng and 'ginseng products'. Ginseng use after cancer diagnosis, particularly current use was positively associated with improved overall quality of life scores, particularly in the psychological and social domains.²⁸ A clinical trial with patients with gastric cancer found that five-year disease-free survival and overall survival rates were significantly higher in patients taking red Ginseng (4.5 g/day) compared to controls.²⁹

Red Ginseng improved erection in men with clinically diagnosed **erectile dysfunction**.^{30,31} Benefit was also demonstrated in two earlier clinical trials.^{32,33} Ginseng (3 g/day of root, containing 85.7 mg/day of ginsenosides) decreased the percentage of dyskinetic (inactive) forms of spermatozooids in healthy males.³⁴

Synergistic Formulation

Rhodiola and Korean Ginseng would complement each other in a very potent formulation with adaptogenic and tonic activity.

Indications

Fatigue, mental and/or physical exhaustion.
Improving mental performance, concentration and memory, especially when under stress.
Improving physical performance and endurance.
Improving sexual function in men.
Relieving menopausal symptoms.
Improving mood in mild to moderate depression.
As an adjunctive treatment in cancer.

Cautions and Contraindications

Caution in patients with hypertension. Best not used during acute infections. Overstimulation may occur in susceptible patients and at high doses.

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