Pronalen Ginseng

*Panax ginseng* C.A. Meyer.

Root.

Ginsenosides (triterpenic saponosides).

Its use in cosmetics is based on its ability to stimulate the general metabolism and its activity against free radicals. Applications in anti-ageing products, nourishing creams, capillary products, body milks, bath products, products for irritated and sensitive skins.

**PRONALEN GINSENG HSC**

Standardised hydroglycolic extract
Titred 0.5-0.7 % ginsenosides.

**PRONALEN GINSENG SPE**

Standardised dry extract.
Titred 28.0-35.0 % ginsenosides.

**PRONALEN GINSENG MS**

Standardised hydrosoluble extract
Titred 0.3-0.5% ginsenosides

**PRONALEN GINSENG HSCMS**

Extract in a medium of Propylenglycol / water (80:20)
**BOTANY**

*Panax ginseng* C.A. Meyer, belongs to the Araliaceae family and its common name is *ginseng*.

This perennial bush grows up to 30-70cm; leaves are palmatilobed (5 lobules); flowers are white, arranged in umbels; fruits are red berries. The yellow-brown roots are the used part of the plant; roots are harvested from 3-6 years old plants. A root reaches 20 mm in diameter, 20-30 cm long (maximum 1 m) and weights about 200 g. Every root bears a number of secondary roots and some yellowish-white rings at the distal end. The roots have a bitter taste and appear in a very characteristic form as they look like the human body.

Ginseng is native to China, Indochina, Korea, Vietnam and Japan. It grows in shady places (direct sunlight damages these plants) and dense conifer forests. At present, no wild-growing ginseng can be found. Ginseng is only available from cultivations (Korea, China, Japan, Bulgaria and eastern Russia). Harvest takes place during September and October. The best area for cultivation is between 36 and 38 degrees latitude, where South Korea is located. Hence, Korean ginseng is considered the best quality ginseng.

**CHEMISTRY**

Ginseng has a large number of active ingredients which act synergically. The main components of the plant are the ginsenosides, specific triterpenic saponosides of which there are more than 20 known molecular structures derived from three basic nuclei.

**Ginsenosides**

Ginsenoside content about 2-3%; these triterpene saponins present in ginseng roots, also called *panaxosides*, may be classified according to their chemical structure in:

- Heterosides of tetracyclic genins from the dammarane series. These heterosides are the most abundant active principles and may be classified in:
- derived from protopanaxadiol: Ra₁, Ra₂, Ra₃, Rb₁, Rb₂, Rb₃, Rc, Rd, Rh₂
- derived from protopanaxatriol: Re, Rf, Rg₁, Rg₂, Rh₁

- Heterosides of a pentacyclic triterpene of the oleanic acid type: Ro (Naval López, M.V. et al., 2002).

![Ginsenosides derived from protopanaxadiol (R₁=R₂=H).](image1)

![Ginsenosides derived from protopanaxatriol (R₁=R₂=H).](image2)

![Ro ginsenoside, derived from oleanic acid (Naval López, M.V. et al., 2002).](image3)

(Acido glucurónico: glucuronic acid; Glucosa: glucose.)
Essential oil

Ginseng contains 0.05% essential oil, mainly composed of limonene, terpineol, sitosterol, citral and polyacetylene alcohols (panaxydol, panaxyol, panaxytriol and falcarkinol).

Other active principles

Heterogeneous polysaccharides (panaxans A, B, C, D, E), proteins (panaxagin), oligoelements, vitamins B and C, phenol acids derived from the benzoic acid (salicylic, vanillic, coumaric acids), steroids, enzymes (amylase, glycolase) and amino acids (tyrosine, lysine, histidine, arginine, etc.).

TRADITIONAL USES

The name Panax is derived from the Greek pan (all) and axos (cure) meaning panacea, after Panakos, daughter to Aesculapius and Epyon, who was able to cure all illnesses according to the Greek mythology. The name ginseng is derived from the Chinese rensheng (= man-shaped root) in reference to the anthropomorphous roots.

Although ginseng is native from Korea and Manchuria, this plant is widely known in other countries. For thousands of years it has been one of the medicines most appreciated by Traditional Chinese Medicine, which attributes the product with healing virtues for all kinds of disorders. Chinese emperors were the first to use this plant, because ginseng was believed to prolong their lives. In the Chinese medical philosophy, the Shen Nung Pharmacopeia states that ginseng has “restoring power on the five viscera regulating the Yin-Yang balance”, which correspond to occidental medicine’s five basic systems of the human body (digestive, respiratory, neurological, circulatory and endocrine-hormonal).

For more than 4000 years, oriental physicians prescribed ginseng as an essential tonic to restore health. Ginseng is also mentioned in the Hindu Vedas, the Indian ancient sacred writings. In China, roots decoction is used as a tonic for the whole organism.

However, today ginseng is basically considered preventative due to its positive effects on the circulatory, endocrine and nervous systems as well as the metabolism in general; the effects of the root have been demonstrated by a large number of scientific studies. In cosmetics, ginseng root is used to formulate creams, shampoos or root-decoctions aimed at improving the skin tone and smoothness and strengthening the hair.
COSMETIC PROPERTIES

It is important to say that ginseng has adaptogenic principles, substances whose activity protects the body from external aggression. The plant increases the defenses of the body to stress caused by intense tension by holding the body temperature and increasing resistance to physical and mental fatigue.

The administration of ginseng has been clearly associated with obvious improvements in the general metabolism and a beneficial effect on circulation and regulation of the tone of the smooth muscles of the blood vessels.

Its stimulating effect on the immune system, its stimulating action on protein synthesis and inhibiting effect on proteic enzymatic degradation in the fibroblasts have been described. It is responsible for increasing phospholipid synthesis in the blood, inhibiting ATPase in the brain and it also has a strong anti-radical effect.

This wide amount of properties give ginseng an almost unlimited use in cosmetics. It can be useful in nourishing and energizing creams, in treating wrinkled and mature skin, and in all cosmetic products used to retard the effects of the aging process. In body milks and bath products, ginseng acts by optimizing the cutaneous metabolism of the whole body and in capillary products, ginseng may be used in treatment products for weak hair and lotions for preventing hair loss as it stimulates growth and gives strength.

Activity on collagen fibers

Yeom, M.H. et al (2003) carried out a study to evaluate the anti-wrinkle activity of ginseng roots. Ginsenosides are high molecular weight, hydrophilic compounds, which cannot penetrate the horny layer. They prepared a hydrolyzate of ginseng saponins (HGS), which contained high levels of K (20-O-β-D-glucopyranosyl-20(S)-protopanaxadiol) and F1 ginsenoside. These compounds, which are the main metabolites of ginsenoside in the human organism, readily penetrate the skin barrier. Thus, this hydrolyzate of saponins maximized the biological activity of ginsenosides.
The authors estimated HGS anti-wrinkle activity by evaluating the *in vitro* HGS contribution to collagen synthesis and metalloproteinase-1 (MMP-1) degradation, and the *in vivo* HGS contribution to collagen synthesis. Total collagen synthesis was determined in normal human skin fibroblasts treated with 0.1 ppm and 1 ppm HGS. Both HGS concentrations increased total collagen synthesis as compared to control (untreated normal human skin fibroblasts). Results corresponding to matrix MMP-1 showed that 0.1 ppm HGS decreased the expression of MMP-1 more than 1 μM retinoic acid (figure 4).

The *in vivo* HGS effects on collagen synthesis were evaluated on hairless, 50-weeks-old mice, which had been exposed to UV radiation for 30 weeks in order to induce photo-aging. The authors conducted *patch tests* on these mice for 7 consecutive days with HGS 0.1% and 1%. After the tests, collagen synthesis was assessed by using immunofluorescence staining of type-1 pro-collagen. Results showed that the HGS treatment significantly increased collagen synthesis as compared to control. Furthermore, it was also observed that higher HGS concentrations induced higher collagen synthesis.

Therefore, Pronalen ginseng is useful to formulate cosmetic products with anti-aging activity.

**Antioxidant activity**

The antioxidant action of ginseng was experimentally verified by evaluating the inhibition of xanthine oxidase-induced or TPA-induced (tetradecanoylphorbol acetate) generation of superoxide radicals, and by evaluating the inhibition of lipid peroxidation through different mechanisms (increase of superoxide dismutase production or reduction of monosaccharide auto-oxidation) (Alonso, J., 2004).

In a study about the antioxidant activity of ginseng roots, liver lipoperoxides were measured in ethanol-intoxicated rats, which had been previously treated
with oral administration of different ginseng root constituents (salicylic acid, vanillic acid, coumaric acid and ginsenosides Rb$_1$, Rb$_2$, Rc, Re, Rg$_1$) at doses of 0.001-1 mg per 30g body weight for 3 weeks. Results showed that salicylic and vanillic acids were remarkably effective in reducing liver lipoperoxides, while saponins were only mildly effective and coumaric acid was ineffective (ESCOP, 2003).

Such antioxidant and collagen synthesis-stimulating activities make Pronalen ginseng suitable for products to reduce wrinkles and to improve mature skin.

**Immunostimulatory activity**

Polysaccharides in the roots of *P. ginseng* showed immunostimulatory action by promoting macrophage phagocytosis and inducing interferon production four times higher than normal. Additionally, an *in vivo* study demonstrated that ginseng polysaccharides promoted mononuclear cell-mediated synthesis of interleukin-2 in the peripheral blood of patients suffering renal conditions. Different studies showed that acidic polysaccharides from ginseng roots stimulated the production of Natural Killer lymphocytes and of interleukin-8 by human monocytic cells (Alonso, J., 2004).

A study carried out with mononuclear peripheral-blood cells sampled from healthy volunteers (n=20), chronic fatigue syndrome patients (n=20) and AIDS patients (n=20) showed that ginseng extract at concentrations of 1, 10 and 100 μg/ml significantly stimulated the immune functions of these cells in all of the subjects (p<0.05 to p<0.001).

In a further study, the mitogenic and anti-complement activities of a standardized ginseng extract and several fractions of it were evaluated on cultures of rat splenic cells. This extract was observed to possess mitogenic and anti-complement activities, with a polysaccharide fraction showing the strongest anti-complement activity. The polysaccharide with the strongest anti-complement activity was composed of arabinose, galactose and glucose, with small amounts of galacturonic acid, glucuronic acid and rhamnose, and a molecular weight of 3.68 x 10$^5$ kD (ESCOP, 2003).

Aging process produces a slower activation of the immune system, which results in reduced cell regeneration. Because of its immunostimulatory activity, Pronalen ginseng is a beneficial treatment for mature and fragile skin.
Hair growth stimulatory activity

Matsuda, H. et al. (2003) observed in a study that a methanol extract from red ginseng roots (*Panax ginseng* C. A. Meyer) had superior activity to that of white ginseng (*P. ginseng*) in a hair growth promoting assay using mouse vibrissal follicles in organ culture. Of the major constituents of ginseng root, ginsenoside Rb₁ exhibited hair growth stimulating activity, while ginsenosides Rg₁ and Ro were ineffective. Additionally, ginsenoside 20 (S)-G-Rg₃ obtained by processing red ginseng crude roots, also showed hair growth promoting activity. These results indicated that ginseng root possesses hair growth promoting activity, and that such activity is mainly attributable to the above mentioned saponins.

Thus, Pronalen ginseng is recommendable to formulate cosmetic products with hair growth stimulatory activity.

Invigorating stimulating activity

It has been demonstrated that ginseng has invigorating and stimulating activities on sexual functions due to its ginsenosides. In 2009, Ki, T.H, et al confirmed that after 8 weeks of a daily uptake of ginseng, male volunteers had an improved erectile function and overall satisfaction scores were higher than in the placebo group. Other studies suggest ginseng as an alternative to sexual dysfunctions medicines, for its stimulating activity (Price, A., et al, 2003).

Therefore, it can be suggested that Pronalen ginseng has invigorating and stimulating activity on blood vessels.

Finally, we would like to mention that the publication *Plants preparations used as ingredients of cosmetic products* (Council of Europe Publishing, 1994) includes a monograph to the glycolic extract and the dry hydroalcoholic extract of *Panax ginseng* C.A. Meyer, where the following cosmetic properties are attributed to them:

- elasticizer, tonic, hair conditioner.
  
  These extracts may be added to the formulation of tonifying bath and shower gels, to shampoos and hair conditioners. Maximum recommended concentration is 0.3% of the dry hydroalcoholic extract and 5% of the glycolic extract.
  
- a further possible application is ginseng use as stimulator.
COSMETIC APPLICATIONS

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RECOMMENDED DOSE

Pronalens Ginseng HSC → 5.0 - 10.0 %
Pronalens Ginseng MS → 5.0 - 10.0 %
Pronalens Ginseng SPE → 0.1 - 1.0 %
Pronalens Ginseng HSCMS → 5.0 - 10.0 %

BIBLIOGRAPHY


Matsuda, H., Yamazaki, M., Asanuma, Y., Kubo, M. Promotion of hair growth by ginseng radix on cultured mouse vibrissal hair follicles. Phytotherapy research, 2003; 17 (7): 797-800.

