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THE ACTIVE NATURE OF SKIN AND ITS AESTHETIC BENEFITS

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Abstract

Skincare becomes in a concept which embraces different fields, such as medicine, nursery, cosmetology, dermocosmetics, science and technology in general. Thereby, it includes corporal hygiene, which allows to remove the accumulated dirt both by own secretions and by external agents with which contact is made; taking the hydration as fundamental measure that tries to supplement or replenish nutrients; until reach the natural photo-protection, solar pharmacological or topic photo-protectors [1].

The comprehension of anatomy and skin physiology becomes fundamental to precise the importance of taking care of the skin, the prejudices of ignoring it, and the risks that derives to health. "The skin is the external cover of the organism, and the most extense organ of the human body, its main characteristic, from which all their functions derive, is that it constitutes a separation wall or barrier between the internal and external environment". It performs metabolic and mechanical functions which are vital for survival, such as protection, thermal regulation, secretion and excretion, absorption, neuro-reception, and synthesis. Plus, it possesses a complex structure "formed by three well-differenced layers": the epidermis, dermis and hypodermis, constituted by extracellular fibers and cells, immersed in a fundamental substance [2].

Skin is exposed to suffer damages due to elements that make up the daily life environment. Thus, the excessive use of electronic devices can cause injuries to the skin, because of the light it emits when its used very frequently. It can generate hyperpigmentation, melasma and premature aging [3]. According to World Health Organization (WHO), nowadays, mobile phones or cellphones, are a constituting part of the modern telecommunication system. In several countries, cellphones are used by more than the 50% of population and the mart is increasing [4]. On the other hand, the electromagnetic radiation can be harmful for the skin, because of their production sources are present everywhere, they are unavoidable [5].

All the data previously exposed indicates the need of promote skincare from a aesthetic and cosmetic point of view, related to preservation of cutaneous health with medical and scientific bases. Maintain a healthy skin is not only have a good-looking skin superficially, but also keep it healthful and balanced; Performing this study contributes to the comprehension of the importance of cutaneous health and how exposed is the skin to suffer injuries and pathologies caused by diverse factors [6].

The general objective of this investigative process is "Preserve and look after the active nature of the skin with aesthetic contributions and benefits". It will be possible to contribute to natural care and balance of the skin in the promotion, benefits, and advantages of natural cosmetics, according to the World Health Organization. Its availability, lower cost and minimal or null secondary effects have created consciousness in society, increasing demand of natural sources to treat diverse skin illnesses [7].

Between the active natural principles highlighted in cosmetics is the Ginseng, which is a chemical compound found only in Ginseng plants. The firsts documented investigations come from the United States in 1854. Subsequently, in 1957, Dr. Breckman contributed an important impulse to the knowledge about the application of this plant during a revision of all the pharmacological, chemical, and biologic studies made and known until then, cooperating with his work to clearly define its action field, giving way to future studies which concluded with the determination of more than 30 different ginsenosides, with well-differenced actions.

Keywords: *Skin, cosmetic, radiation effects, Ginseng, Active ingredient*

Introduction

There are an enormous number of natural factors which interfere in the human being and its health, terrestrial life exists in a continuous radiation cross process, intermittently, all living beings receive radiation, which can be both inoffensive or harmful for our growth, development and wealth [9]. Among the beneficial effects of UV radiation, it includes the synthesis of Vitamin D, which is essential for human health, helping the body to absorb the calcium and phosphorus from the food and contributing to bone formation. The World Health Organization (WHO) recommends from 5 to 15 minutes of sun exposure, 2 or 3 times per week [10].

Sun exposure is a common sense affair. Receiving solar radiation is necessary (moderately and with some limitations). With the right precautions it is feasible to take advantage of the hours you dedicate, and the skin and the immune system will be notoriously benefited from its action [11]. This project will be focused on the pollution of non ionizable electromagnetic radiation, it constitutes the subtlest influence in the environment, which is becoming a huge concern due to the accelerated growth in the last years, its sources and consequences.

On the other hand, the electromagnetic fields produced by artificial media are grouped by potency in radiofrequencies of low, median, high and very high frequency. In this group there are found the waves used in telecommunications such as radios, TVs, mobile telephony and microwaves. It is relevant to emphasize that we are exposed to many pollutants everyday, these agents act synergistically, being altogether more harmful than each one separately [9].

In addition, the UV rays, both natural and artificial, harm the skin in response to the constant and unprotected exposure, with results like dark spots, wrinkles, serious diseases, cancerous lunars or even cancer. Artificial lights, such as lamps or light bulbs can have negative impacts towards this organ, the prolonged and continuous exposure as it happens in the case of people who spend hours in the office, can cause dark spots. Some artificial lights can emit long wave ultraviolet rays (UVA), which penetrate through the epidermis, being responsible for premature aging, and changes in coloration [12].

The variety of skin types and the damage caused by endogenous and exogenous factors, have implemented in cosmetic industry products that can adapt better to the needs of clients, allowing to highlight the natural products, which give benefits such as renovation and protection in a shorter amount of time, for owning active principles that provide nutrients and absorb very quickly for being related [13].

Natural cosmetics are elaborated through the use of plants and renewable raw materials. The use of natural ingredients for skincare brings many benefits, all suitable for every skin type. Natural aesthetics are specially indicated for people with sensitive skin; this due to the elimination of secondary problems, it adapts more easily to the skin, easily absorbs ingredients and it is not necessary to apply large quantities of products to obtain results, allowing a greater lifespan than conventional products.

Methods

Study design: Literary review of scientific articles focused on care and conservation of active nature of the skin and its aesthetic benefits.

Research strategy: Bibliographic research in different databases of google scholar, such as Google, SciELO, PubMed, EBSCOhost. With fundamental key words (skin, radiation effects, cosmetic, active principle, ginseng) in spanish, english or korean.

It has been established a range of a decade for article research, considering that the temporality of bibliographic reviews encompasses a 10 years period, which leads to the determination that the studies published in the current year could not be registered timely in the databases.

Research limits: It has been centralized specially for people interested in skincare.

- Articles about studies based on skincare
- Articles referenced to skin alterations

- Articles published in Spanish, English and Korean
- Articles about natural cosmetics and its benefits
- Articles related to the active principle of ginseng
- Articles that have been published between January of 2008 and January of 2020

Data selection: Data has been identified through electronic, bibliographic and literary research, where the articles of interest were selected initially by reading the title, abstract and the body of the article, taking into account the established criteria.

Results

Ginseng (Panax ginseng): It is a plant belonging to the family Araliaceae and the genre Panax. It's scientific name is Panax ginseng. C. A van Meyer gave it the denomination that we know nowadays. Etymologically, Panax comes from the Greek "pan" (everything) and "axos" (medicine), for what its meaning would come to be "heals everything". Its diverse properties, scientifically proven; are due to the elevated number of active substances contained in the roots.

The habitat and distribution of wild ginseng is in east Asia, that is why Korea has a privileged place for its growth due to the ideal climatological conditions. Wild ginseng has been gradually disappearing, contrary to what happens with the demand for its medicinal use. The main culture areas are Korea, China, Japan and the United States [8].

Currently, about 14 plants, including 12 species and 2 infra-specific taxa are known. Which have been recognized as members of the Panax genre, belonging to Araliaceae family, identified in the table 1 [14].

Chemical compounds: Is found only on ginseng plants, and has a huge amount of effects. Currently, there have been identified about 100 gingenosind compounds, which show a wide variety of subtle biological effects, and they are hard to characterize when studied alone [14, 15].

The main active principles isolated from the roots are:

- ***Triterpenic saponins (2-3%):*** Ginsenosides (Ro_R h2) also called panaxosides (A-F) Which can be divided in two groups:

- Derivatives from the oleanan group. The ginsenoside to is the only represent active of this group (pentacyclic triterpene)

- Derivatives from damnarane group (pentacyclic triterpenes), at the same time, this group can be divided in two:

- Derivatives from protopanaxadiol: Ginsenosides Rb1, Rb2, Re, Rd, Rh2

- Derivatives from protopanaxatriol: Ginsenosides Re, Rd, Rhl, Rg2, Rh1

- ***Other components:***

- Carbohydrates, such as high molecular weight polysaccharides called paxanes.

- Essential oil or panacene (mainly constituted by limonene, terpineol, citral and poly acetylenes).

- Group B Vitamins, 81, 82, 812, folic acid, nicotinamide, pantothenic acid, Vitamin C and trace elements: Zn, Cu, Fe, Mn, Ca, etc.

- Other components such as b-sitosterol, starch, pectin, mucilage, free and esterified fatty acids, among others [8]

The components in this family are found almost exclusively on Panax genre (ginseng) which has a long history in terms of traditional medical use; this has led to the pharmacological study of these ginseng derivative effects. In cosmetics, the ginsenosides exhibit a variety of subtle biological effects which are hard to characterize when studied alone [16]. Other components such as antioxidants, melanogenesis inhibitors could be potential candidates to new whitening agents of the skin [17].

Ginseng uses according to scientific studies

Medicinal use: The used part of ginseng is the root fig. 1. It has adaptogenic properties, which means that it is capable of adapting the organism under stress, physical or physic overload, among others; by stimulating the non-specific resistance of the organism. It presents stimulating anabolic activity of

the Central Nervous System. It increases energy production, as well as enzyme production, which purify toxic substances coming from the metabolism process. It promoted the defense against tissue aging and acute fatigue through the free anti-radical effect.

Hypoglycemic activity as it increases insulin secretion, besides, it regulates the synthesis of hepatic glycogen. Tonic and reinforcing in the deficient states due to physical overload, pathologies or surgical interventions which can cause physical deterioration [8].

Pharmacological use: The pharmacological functions of ginseng, which was considered a high-grade herb, were described for the first time at the Shennon Bencao Jing. The ginseng can nourish or tone five (5) vital organs in the human body (spleen, lung, hearth, kidney and liver). It has sedative properties, used for restoring the normal pulse, dissipates pathogenic factors, improves visual acuity and mental activity, it also improves longevity with long-term intake [18].

There are many types of ginseng available, such as fresh ginseng, white, steamed, acid-processed and fermented. The diverse processing methods produce a variety of compositions with various pharmacological properties. It has been used orally, for treating diverse diseases such as hypertension, diabetes, mellitus, hepatic and kidney dysfunction, mental disorder and post-menopausal disorders. Plus, topic applications to heal wounds and reduce skin inflammation. Its possible therapeutic effects have been attributed mainly to its immunomodulatory, neuroprotector, antioxidant, antitumor and hepatoprotective activities [17].

Dermatological use: Scientific studies demonstrate that the availability of non-invasive techniques in dermatology show substantial differences towards its limitations and opportunities, potential clinical applicability and viability. In the study of recent non-invasive cases in dermatology, it is informed the possible mechanisms by which herb-based plants can improve the physiological and inter-cellular properties of skin lipids. The use of herb-based plants could be a valuable alternative focus to prevent and treat skin disorders. [19]

Cosmetic use: Studies demonstrate that enzyme-modified ginseng extract and red ginseng also enzymatically processed have inhibitory effects against cutaneous aging induced by UVB rays (photoaging) in human dermal fibroblasts [20], as well as the inhibition of melanogenesis by Korean red ginseng extract (KRG) in vitro, its results induced a strong suppression of tyrosinase activity and melanin production in cells, it also reduced transcription and translation of components involved in the melanin production pathway, wrinkle formations and it inhibited collagen degradation.

In human skin, ginseng skin increased elasticity and moisture, improved the skin tone, therefore, we concluded that KRG is an excellent whitening and anti-aging product [21].

Cosmetic benefits

Anti-aging: It contains a huge quantity of phytonutrients, which can stimulate and activate skin metabolism. It releases the skin of free radicals that are accumulated when skin is exposed regularly to sunlight and environmental pollution. It also can increase collagen production making skin tighter. This collagen makes skin more elastic and toned, thus decreasing the wrinkles of fine lines on the face and body parts.

Improves complexion: The roots and leaves of ginseng are full of vitamins, minerals and antioxidants, which are beneficial for general skin wealth. They metabolize skin cells and facilitate the elimination of dead cells to produce a newer and healthier skin; regenerate skin cells to increase oxygenation, it also improves blood circulation and is an excellent blood detox.

Skin diseases treatment: The incomplete cutaneous metabolism contributes to skin problems such as acne, eczema and rough skin. Ginseng is effective towards these problems, since it is easily absorbed by the skin and improves the subcutaneous vascular circulation.

Skin whitening: Several reports have shown that the extract, powder or some ginseng components may inhibit melanogenesis. The underlying mechanisms of the ginseng anti-melanogenic effect or its components included direct inhibition of key enzymes of melanogenesis. These findings suggest

that ginseng and its components could be potential candidates for new skin whitening agents [22].

How it acts on the skin: The topic use of ginsenosides in the vastness of natural components used for skin care, provides a huge impact on the skin. The active principles of the ginseng penetrate easily through the skin, and transport beneficial substances, thanks to the permeability, arrives to the epidermis, and brings quality and speed to the reproduction of germ extract cells.

Ginseng extract will give essential nourishment to these cells, with the aim of retarding skin aging, by stimulating the mitosis process, relieving skin fatigue and will provide the formula so it has a small sunscreen factor. With activities that include improving the microcirculation, boosting the synthesis of collagen to reduce wrinkles, reverting the skin damage due to overexposure to UV light or heat, and even direct the healing to fix the wounds of the skin [22] On table 2, there are diverse ginseng extracts reported with biological activity to conserve the skin's nature.

Innovation: Nowadays K-beauty cosmetics (Korean beauty) is an explicit representation of the cosmetic sector of South Korea as a phenomenon that starts to influence the global cosmetic industry, considered one of the best wholesalers of beauty products in the year 2020, in Korea. Similarly, this manifestation influences trends and consumer habits in terms of skin care. The most dynamic and innovative industries in the world. This characterization has a particular importance since in the framework of the Free Treaty Trade (FTA) between Colombia and South Korea there have been identified opportunities so that Colombian businesses could insert themselves in the value chain of the Korean cosmetic industry through the exportation of natural ingredients or active components derivative of Colombian biodiversity. Another essential feature of the South Korean cosmetics industry is related to the use of medicinal botany and traditional knowledge known as "Hanbang", based on a wealth of ancient knowledge about the benefits and properties of plants for health and well-being in general. This compilation of information has been important to optimize the use of different natural ingredients in cosmetic formulation and has shaped consumer preferences for products with this type of components [23] [24]. Plants such as ginseng (Panax ginseng) Chaga mushroom (Inonotus obluiquus), sparkle Asian (Centella coriacea), lotus flower (Nelumbo nucifera), camellia, green tea (Camellia sinensis) and rice (Oryza sativa), among others, which have been used during hundreds of years in asiatic traditional medicine, and they have been incorporated as botanical ingredients in the creation of cosmetic formulas due to its effectiveness [25].

K-beauty has popularized in 2016 as an expression of changes caused by South Korean beauty products on the occidental cosmetic industry [26, 27] K-beauty makes reference to South Korean and foreign beauty products whose production is based on trends and knowledge about innovation and technology of this country [24]. Factors expressed through the lifestyles which have lasted in South Korean culture since ancient times. The importance given to personal care in this culture, is the base of the highest standards of their, having a clear, bright and moisturized skin is not only a representation of the highest beauty standards, but also a presentation letter which can affect opportunities for the development of personal and professional life of citizens frequently associated with health and wellness. In South Korea, light skin tones have been, for hundreds of years, beauty, social standards and personal success references [25].

The figure 2 represents cosmetic products with ginseng active principles which are found in cosmetics based on essential oils, and creams with benefits such as calming, nourish, moisture, for pigmentation, masks, tonic waters, anti-cellulite, anti-inflammatory, antioxidant, among others, blended with other active principles that complement the mechanism of action of cosmetics.

The most relevant properties that have been attributed to ginseng are related to the strengthening of the immune system and its anti-inflammatory. Some of them are:

- Stimulare and revitalize all types of skin
- Brighten the skin
- Moisturize
- Contribute antioxidants to the skin

- Contribute vitamins and minerals
- Improve skin elasticity
- Delay cutaneous aging
- Fight the negative effects of the pollution in the skin [28].

Discussion

Skin has diverse functions such as helping the good performance of the human body, it is a thermal regulator which allows and maintains a stable body temperature, skin is a great Vitamin D generator (the only vitamin synthesized by the human body under the action of UV rays). Plus, it acts as a protective barrier which isolates the organism of the environment that surrounds it, contributing to maintain their structures intact, even though it is always exposed to external factors that alter functional balance such as changes in temperature and humidity, exposure to chemical products, use of unsuitable cosmetic products and those with basic pH and excessive exposure to UV radiation, artificial electromagnetic pollution, amount others [9-40]. With the aim of contributing the natural maintenance and functioning, proper care must be carried out which provides benefits suitable for all skin types.

The aesthetics with natural active ingredients is especially indicated to be used on sensitive skin, eliminating the risk of secondary problems, adapting better to the skin, being easily absorbed in the different layers of the skin, allowing permeability in the places where you need them.

This research chooses the Panax ginseng which is a traditional medicinal plant that has been used therapeutically for millennia in East Asia. In Korea, China and Japan, ginseng is the most valuable of all medicinal herbs. In recent decades, extracts have shown a wide range of effects against human diseases. The Topical applications have also been used to heal wounds, reduce inflammation, and skin alterations. Ginseng contains a number of active ingredients that have different effects on carbohydrate, lipid and cellular metabolism, cognition, angiogenesis and neuroendocrine system, ginsenosides being the main biologically components most studied assets.

Several studies have shown that ginseng has an important role in pharmacological, dermatological, medical and cosmetic effects, demonstrating its efficacy [8]. Among the list of herbal products with the use of non-invasive dermatological techniques, are the following: -Randomized, double-blind, placebo-controlled study on the efficacy and Safety of "Red Ginseng Enzyme Treated Complex Powder for Anti-Wrinkle and Proelasticity in people with healthy skin-, with use of the type of product (powder, administered orally), extraction solvent (Ethane - water), used boil (Panax Gingeng Meyer), species (human normal women) [34]; in another study - Korean red ginseng powder in the treatment of melasma: an uncontrolled observational study - Korean red ginseng powder showed good tolerability, it would be considered a useful adjunct therapy for patients with melasma [41].

These studies have efficient results and achieve scientific evidence. In the same way, cosmetology has used numerous plants for many years, today for the demonstration of the effects also performs and remains at the forefront of science demonstrating the effectiveness of cosmetics on the skin.

Cosmetics studies have shown that enzyme-modified ginseng extract and enzymatically processed Korean red ginseng have inhibitory effects against UVB-induced skin aging in human dermal fibroblasts, with the study -Anti-aging effects of the mixture of Panax ginseng and Crataegus pinnatifida on fibroblasts human dermals and healthy human skin-. The results have led to the hypothesis that the mixture of P. Korean ginseng and C. pinnatifida (GC) inhibits the formation of wrinkles in the aging human skin, works effectively in cosmetic applications by control of collagen metabolism, GC treatment strongly improved the expression of type I procollagen that was reduced by UVB exposure (up to 249%) [20]. A lot of studies have reported that P. ginseng is a powerful skin antiaging agent [29, 32, 31].

Skin and its care are fundamental not only in a superficial or aesthetic aspect, but also for health, this due to the role it has in the organism, which is key to extend in the whole body and reflect physical

health. It is also an organ in constant direct contact with the environment, which is why it receives a greater number of external aggressions.

It is important to recognize how fundamental is the skin care, skin must be protected from external factors which are harmful to the health (including sunlight), but this will not only cause dryness, burns or other common long-term effects such as premature skin aging and even cancer. It also brings great benefits to our system: ultraviolet light produces the only vitamin that the human body does not synthesize: vitamin D. As long as the skin is exposed for the recommended time, it will not cause adverse consequences. Likewise, we also include electromagnetic radiation to which we are exposed daily, including ionizing and non-ionizing electromagnetic ones. It is shown that, blemishes on the skin and face, premature aging, lack of hydration, irritations on the skin, among others, it is not produced only by exposure to the sun's rays, but also by the high range of light emitted by new technologies such as cell phones and computers. Although it is not as aggressive as ultraviolet rays, constant exposure to it contributes to pigment the skin in the same way. Just as we can see the adverse consequences we can also find benefits of electromagnetic radiation that significantly influence the cellular processes of division, proliferation and metabolism.

The active principle that prevailed for this project was the ginseng, a plant that accumulates its properties in its roots. Among its components are vitamins, fatty acids and minerals like potassium, calcium, phosphorus, iron and magnesium. It easily penetrates the skin, thus allowing all its properties to reach up to the layer of the epidermis where the new cells are generated.

Ginseng works by improving the microcirculation, boosting collagen synthesis; its essential nutrients in contact with cells, reverse the damage caused by overexposure to heat or UV light and provide a sunscreen factor in the formulas that contain it; ridding the skin of free radicals accumulated when people are regularly exposed to sunlight and environmental pollution. For their effects, mechanisms of action and the great variety of studies demonstrating its effectiveness scientifically in pharmacology, dermatology and cosmetics ginseng meets the requirements and is the ideal component for skin care. After having exposed the subject, with this investigative work the purpose is to initiate a reflection about what was studied. From the point of view of the aesthetic professional, it is essential to have knowledge of the fundamentals that stand out of the skin, all the existing skin types, the importance of care and how we can treat the skin with the damage to which it is subjected daily.

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Table 1. Scientific and common names of panax plants

Scientific name	Range	Common name
Panax bipinnatifidus	Specie	
Panax bipinnatifidus var. angustifolius	Infra-specific taxon	
Panax bipinnatifidus var. bipinnatifidus	Infra-specific taxon	
Panax ginseng C. A Mey	Specie	Korean ginseng
Panax japonicus (T.Ness) C. A Mey	Specie	Japanese gingseng
Panax notoginseng (Burkill) F. H Chen	Specie	Chinese ginseng, sanchi
Panax pseudoginseng Wall	Specie	
Panax quinquefolius L.	Specie	American ginseng
Panax sokpayensis Shiva K. Sharma & Pandit	Specie	
Panax stipuleanatus H. T Tsai & K. M Feng	Specie	
Panax trifolius L.	Specie	
Panax vietnamensis Ha & Grushv	Specie	Vietnamese ginseng
Panax wangiaanus S. C Sun	Specie	
Panax zingiberensis C. Y Wu & Feng	Specie	

Table 2. Reported ginseng extracts biologically active to preserve skin nature.

No	Biological activity	Ginsenoside component	Language	Release date	Reference
1	Antioxidant and immunomodulatory, reduce the pigmentation induced by UVB rays	Koread red ginseng, composed mainly by ginsenosides and phenolic compounds	English	2011	Song, M., Mun, JH, Ko, HC, Kim, BS y Kim, MB (2011). Polvo de ginseng rojo coreano en el tratamiento del melasma: un estudio observacional no controlado. Revista de investigación sobre ginseng, 35 (2), 170-175. [29]
2	Inhibitory effects against the cutaneous aging	Panax ginseng and Crataegus pinnatifida	English	2017	Hwang E., Park SY, Yin CS, Kim HT, Kim YM, Yi TH Efectos antienvejecimiento de la mezcla de Panax ginseng y Crataegus pinnatifida en fibroblastos dérmicos humanos y piel humana sana. J. Ginseng Res. 2017; 41 (1): 69–77. [30]

3	Inhibits cutaneous aging induced by UVB through regulation of the expression of procollagen type I	Modified Panax ginseng	English	2014	Hwang E., Lee TH, Park SY, Yi TH, Kim SY Panax ginseng modificado con enzimas inhibe el envejecimiento cutáneo inducido por UVB mediante la regulación de la expresión de procoláge
4	Protects the human keratinocytes HaCaT of apoptosis induced by UVB	Ginsenoside F1	English	2003	Lee EH, Cho SY, Kim SJ, Shin ES, Chang HK, Kim DH, Yeom MH, Woe KS, Lee J., Sim YC, Ginsenoside F1 protege los queratinocitos humanos HaCaT de la apoptosis inducida por ultravioleta-B al mantener niveles constantes de Bcl-2. J Invest Dermatol. 2003; 121: 607–613. [32]
5	Anti-wrinkle therapy in healthy skin	Panax ginseng enzymatically modified	English	2015	Hwang, E., Park, SY, Jo, H., Lee, DG, Kim, HT, Kim, YM, y Yi, TH (2015). Eficacia y seguridad del Panax ginseng modificado con enzimas para la terapia antiarrugas en piel sana: un estudio de un solo centro, aleatorizado, doble ciego y controlado con placebo. I18 (5), 449-457.[33]
6	Anti-wrinkle and proelasticity in people with healthy skin	Red ginseng enzymatically treated, powder.	English	2016	Park SY, Shin YK, Kim HT, Kim YM, Lee DG, Hwang E, Yi TH Estudio de un solo centro, aleatorizado, doble ciego y controlado con placebo sobre la eficacia y seguridad del "ginseng rojo tratado con enzimas complejo en polvo (BG11001) "para antiarrugas y proelasticidad en personas con piel sana. J. Ginseng Res. 2016; 40 (3): 260–268. [34]

7	Protective effects against oxidative damage of UVA-irradiated human keratinocytes	Ginseng leaf extract	English	2014	KIM, Mi-Ryung y col. Efectos protectores del extracto de hoja de ginseng mediante extracción enzimática contra el daño oxidativo de queratinocitos humanos irradiados con UVA. Bioquímica y biotecnología aplicada, 2014, vol. 173, no 4, pág. 933-945. [35]
8	Hyaluronic acid production by activation of ERK and Alg mediated by Src tyrosine kinase in human keratinocytes.	20-O-β-D-glucopiranosil-20 (S) - protopanaxadiol , Rb1 ginsenoside metabolite	English	2015	Lim, Tae-Gyu y col. "El 20-O-β-D-glucopiranosil-20 (S) - protopanaxadiol, un metabolito del ginsenósido Rb1, mejora la producción de ácido hialurónico mediante la activación de ERK y Akt mediada por la tirosina quinasa Src en queratinocitos humanos". Revista internacional de medicina molecular 35.5 (2015): 1388-1394.[36]
9	Anti-photoaging of the skin	Rh2 ginsenoside epimer	English	2014	Oh, Sun-Joo, et al. "Propiedades anti-fotoenvejecimiento de la piel de los epímeros de ginsenósido Rh2 en células de queratinocitos humanos irradiadas con UV-B". Revista de biociencias 39.4 (2014): 673-682.[37]
10	Topical induction of type I collagen	Rb1 ginsenoside	English	2012	Kwok, Hoi-Hin y col. El ginsenósido Rb1 induce la expresión de colágeno de tipo I a través del receptor delta activado por el proliferador de peroxisomas. Farmacología bioquímica , 2012, vol. 84, no 4, pág. 532-539.[38]

11	Anti-photoaging of the skin	Rh3 ginsenoside	English	2014	Kwok, Hoi-Hin y col. El ginsenósido Rb1 induce la expresión de colágeno de tipo I a través del receptor delta activado por el proliferador de peroxisomas. Farmacología bioquímica , 2012, vol. 84, no 4, pág. 532-539.[38]

Figure 1. Ginseng (*Panax ginseng*) Available at: https://images.app.goo.gl/s4FMdXkdzRLZZHMb6

Figure 2. Natural cosmetics. Available at: https://images.app.goo.gl/ahWV68fcmbqnJFSm7