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GINSENG: AN SIGNIFICANT NATURAL REMEDY FOR HEALTH AGING

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ABSTRACT

Aging is an inevitable biological process that leads to progressive structure modification and physiological dysfunction. It's an outfit that magnifies veritably small objects that aren't visible to the naked eyes. Microscope see organism that we can not see or study. Multitudinous propositions have been proposed to regarding the process from a Western drug perspective; still, ancient Chinese drug practices and propositions have decreasingly gained attention, particularly ginseng, a lawn that has been studied for theanti-aging parcels of its active ingredients. This review seeks to dissect current data on ginseng and its anti-aging parcels. The factory species, characteristics, and active constituents will be introduced. The main part of this review is concentrated on ginseng and its active factors with respects to their goods on dragging lifetime, the regulation of multiple organ systems including cardiovascular, nervous, vulnerable, and skin, as well as theanti-oxidant andanti-inflammatory parcels. The molecular mechanisms of these parcels illustrated via colorful studies are epitomized as farther substantiation of the anti-aging goods of ginseng.

KEYWORDS: Ginseng, Anti-aging, Pharmacology, wild-simulated ginseng, cultivation.

INTRODUCTION OF GINSENG

Species of ginseng

The English word “ginseng” stem from the Chinese word rénshēn. Rén means person, while shēnmeans factory root. Ginseng’s pronunciation comes from Cantonese “yun sum “or the Hokkien pronunciation “jîn- sim”. Ginseng is a slow- growing imperishable factory with eshy roots, and belongs to the rubric Panax of the family Araliaceae. The rubric Panax derives its name from the Greek words visage(each) and akos(mending). Ginseng is generally used as a health supplement, and in numerous herbal formularies to treat all kinds of ails in East Asian countries.[2] The ancient Chinese havelinked,146 medicinal species from 383 families, and further than 400 of which are extensively used throughout the world. Panax ginseng(Ginseng) is a well- known condiment in traditional Chinese drug(TCM). Traditional Chinese drug is still generally used in China. Further than half of the population regularly uses traditional remedies, with the loftiest frequence of use in pastoral areas. About 5000traditional remedies are available in China; they regard for roughly one fth of the entire Chinese pharmaceutical request.P. Ginseng is frequently described as the lord or king of sauces(Wen and Zimmer, 1996), which occupies an recognized spot in TCM and traditional oriental drug in utmost countries.[1]

Panax ginseng C.A. Meyer(Korean ginseng)

Panax japonicas C.A. Meyer(Japanese ginseng)

Panax major Ting

Panax notoginseng(Bur kill)F.H. Chen(Sanchi ginseng)

Panax omeiensisJ. Wen

Panax pseudoginsengWallich

Panax quinquefoliusL.(American ginseng)

Panax sinensisJ. Wen

Panax stipuleanatusH.T. Tsai &K.M. Feng

Panax trifoliusL.(Dwarf ginseng)

Panax wangianus Sun

Panax zingiberensisC.Y. Wu &K.M. Feng

Panax vietnamensis Ha et Grushv.(Vietnamese ginseng)

Plant characteristic

Ginseng study was carried out to probe the growth characteristics of wild-simulated ginseng by direct sowing and broadcasting civilization for develop standard civilization ways of wild-

simulated ginseng.[2] The study was carried out to probe the growth characteristics of wild-simulated ginseng by direct sowing and broadcasting civilization for develop standard civilization ways of wild-simulated ginseng,[4] As a result of this study, the germination rate of wild-simulated ginseng was signicantly loftiest when seed size was over6.5 mm in the spot sowing civilization. In the case of broadcasting, survival rate was signicantly increased when the periphery of root was over 10 mm, planting distance was 7 cm, and the consistence of soil covering was less also 2 cm. The result of growth characteristics of wild-simulated ginseng by civilization type, growth of stem in spot sowing civilization was showed signicantly increased when seed size over 6 mm, sowing number was 3 grains, and the sowing distance was less also 5 cm.[4]

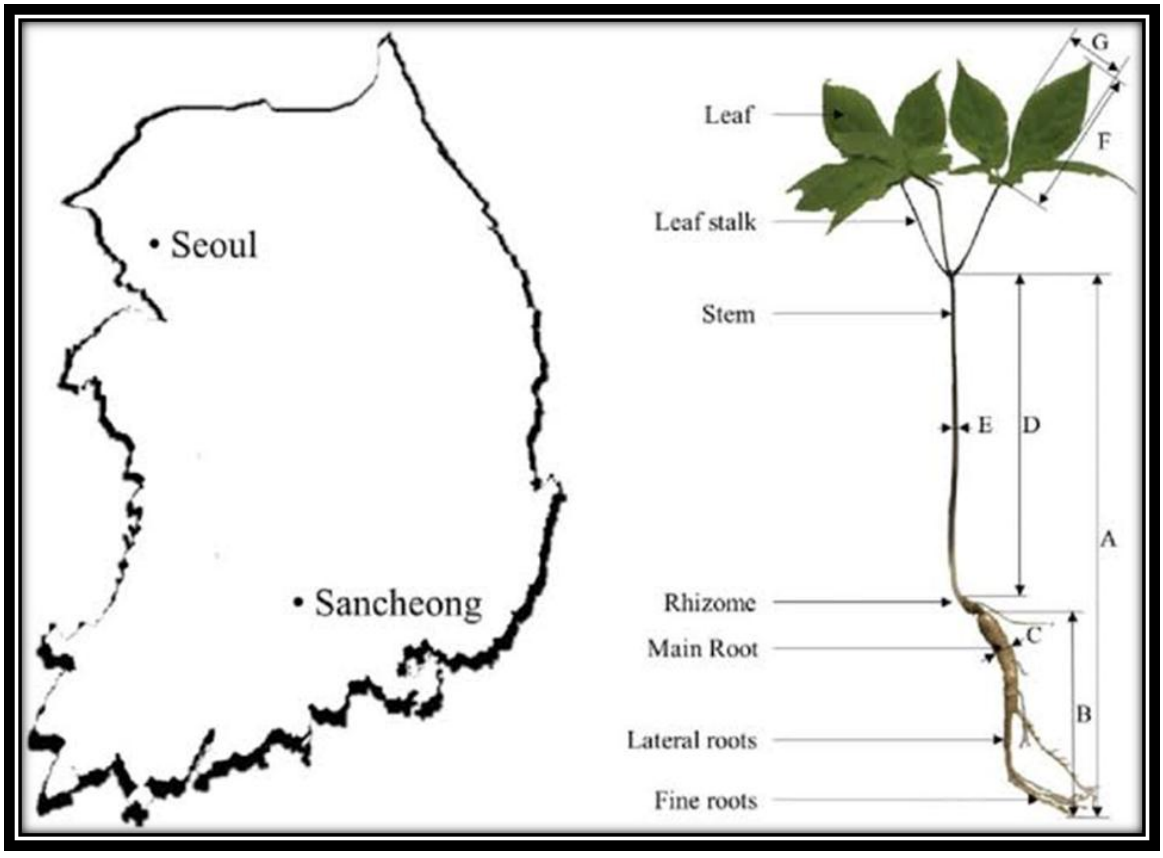

Figure 1: Map showing the research sites and structure MCG and investigate of growth characteristics. (A) Length of total ginseng, (B) length of root, (C) diameter of root, (D) length of shoot, (E) diameter of shoot, (F) length of leaf, (G) width of leaf.

Ginseng, which belongs to the rubric Panax and family Araliaceae, is extensively used in East Asia as an herbal medicinal factory, as it has excellent medicinal parcels.[6] A progressed 6-time-old ginseng on normal would have a total root length of about 34 cm, with the primary root being about 7- 10 cm long and3 cm wide, with several stout rootlets. Average weight

ranges from 70 – 100g. New kids grow from its rhizome each spring, and the stalk withers down each afterlife but traces of it remain in the rhizome each time. The periodic stalk growth from ginseng's rhizome is an important identifier in distinguishing ginseng from other ginseng- related products.[2]

Processing of Ginseng

Ginseng's medical products are classied into three orders – fresh, white, and red ginseng depending on the processing.[9] Nearly all medical products are deduced from ginseng after 4 to 6 times of civilization. Fresh ginseng is dened as lower than 4- time-old and required minimum processing. White ginseng is 4-6-year-old, and is hulled and dried. Red ginseng is 6 times old that's rst fumed and also dried.[2] Red ginseng(RG) is substantially divided into Chinese red ginseng(CRG), American red ginseng(ARG), and Korean red ginseng(KRG). The three red ginsengs parade good bioactivities because of rich rareginsenosides than ginseng. Also, there are egregious distinctions from the chemical composition and content of CRG, ARG, and KRG, thereby leading to differences in colorful operation, together with a wide range of red ginseng products on the request with uneven quality.[7]

• **Fresh Ginseng** – Fresh ginseng also called "green ginseng", is non-dried raw product. Its use is limited by vacuity. Dry sells high, but fresh is stylish. At the North Carolina Ginseng Association meeting in March, Trivett explained that fresh roots are easier to handle, whereas dry roots are more prone to breaking, which diminishes their value, and some people are more at drying roots duly than others. INTCM, ginseng is a largely valued condiment and has been applied to a variety of pathological condition sand ails similar as hypodynamia, anorexia, briefness of breath, pulsation, wakefulness, incompetence, hemorrhage and diabetes.

• **White Ginseng** – White ginseng is hulled and driedginseng.White ginseng is fresh ginseng which has been dried without being hotted. It's hulled and dried to reduce the water content to 12 or lower. White ginseng air- dried in the sun may contain lower of the remedial ingredients. Enzymes contained in the root may break down these ingredients in the process of drying. Drying in the sun bleaches the root to a unheroic-white colour.

• **Red Ginseng**- Red ginseng is fumed and dried ginseng, which has sanguine color. Red ginseng is less vulnerable to decay than white ginseng. It's ginseng that has been hulled, hotted through storming at standard scorching temperatures of 100 °C(212 °F), and also dried

or sun- dried. It's constantly marinated in an herbal pop which results in the root getting extremely brittle.

Active part and ingredients of Ginseng

Hard times make people stronger. Roman minstrel Horace states that "Adversity has the effect of inspiring bents which in prosperous circumstances would have lain dormant. "From particular experience as well as from reading the novel The Grapes of Wrathby John Steinbeck I absolutely agree with this statement. Putreed children noway learn how to do anything themselves. I've a many musketeers that are extremely putreed and noway work for what they admit. Their parents payforcleansers to clean their room and they get brand new buses for their 16thbirthdays. One friend inparticular has been oundering recently. Her mama has lately come ill and she has been forced to take care of her siblings. Her father is always working, thus, she's anticipated to drive far and wide and make regale. Through her mama 's sickness she has been suitable to see how important she truly loves herfamily. She has also realized that she loves cuisine. She loves making food and getting a great result.Had it not been for the delicate time she'd have noway realized her gift for cuisine and her love for herfamily. Ginseng, the root of PanaxginsengC.A. Meyer, has been traditionally used for the treatment of central nervous system conditions, analogous as knowledge and memory scarcities, mood conditions.[3] Traditionally, the root of ginseng is considered to be the only effective part used to treat various conditions, but through phytochemical studies and pharmacological disquisition, its other corridor including the owers, leaves and fruits have also been discovered to be effective against fatigue, hyperglycaemia, obesity, cancer, and retainanti—inammation andanti- growing parcels.[2] Ginsenosides are the main medicinal ingredients in ginseng, and there are two types of ginsenosides, protopanaxadiols(PPDs) and protopanaxatriols(PPTs).[3] Ginsenosides, which belong to steroidsaponins, are the major factors of ginseng. Over 100 ginsenosides have been separated from the lines.These ginsenosides are named as Rx the 'x' represents the opposition of each ginsenoside on the thin-caste chromatography, in which the most polar element is named as Ra, while the least polar bone is addressed as Rh According to the difference of backbone ginsenosides can be classied into fourtypes, the PPD-, PPT-, ocotillol- and oleanolic acid-types.PPD- type ginsenosides include Ra1, Ra2, Ra3,Rb1, Rb2, Rb3, Rc, Rd, F2, Rg3, Rg5, Rh2, Rh3, CK and PPD. PPT- type ginsenosides include Re, Rg1,Rg2, Rg4, Rh1, Rh4, Rf and PPT, Ocotillol- type ginsenosides contain 24(R)- pseudoginsenoside- F11,24(R)- pseudoginsenoside- RT5, Majonoside R1 and R2, and Ro is an oleanolic acid- type

ginsenoside.[8] While ginsenoside Rb1 of PPDs is the topmost and most studied in recent times. Pharmacological studies have shown that ginsenoside Rb1 has a two- way adaption effect on the central nervous system, mainly to strengthen the excitability and inhibition processes in cerebral cortex.[3] Unlike GinsenosidesRb1, Rb2, Rg1 and Re, conation K, PT and PD, the intestinal metabolites of PPTs and PPDs,, haveinhibitory goods similar to that of the mortal liver enzyme cytochrome P450 inhibitory goods.[2]

Anti-aging properties of ginseng

As aging is a multisystem and multifactorial process, the different propositions of aging are actually antithetical. In this review, we present substantiation of theanti-aging parcels of ginseng discovered through exploration, and how the substantiation largely supports the damage or error proposition as forenamed.[2]

Prolonging lifespan

Ginseng (Panax ginseng Meyer, Araliaceous) is an important traditional medicinal herb that has been widely used for millennia. Red ginseng (RG) that is steamed and dried from fresh ginseng exerts a variety of physiological effects, which include prolonging the lifespan of Drosophila melanogaster and improving learning and memory.[10] While ginseng does not significantly prolong the lifespan of aging mice, but it stabilize mice's behaviour by antagonizing stress.[2] In this study, an integrated analysis of protein changes of 36-day-old female D melanogaster (old-age) was performed using isobaric tag for relative and absolute quantitation (iTRAQ).[10]

Anti-oxidation effects of ginseng

The pharmacological histories of American ginseng and Chinese ginseng are much shorter than that of P. Ginseng. Chinese ginseng has been used medicinally since the 16th century whereas American ginseng has only been used since the early 18th century when it was first discovered in Canada and became known to Chinese merchants.[9]

The ginseng berry has been shown to suppress reactive oxygen species production NF-κB activation and inflammatory gene expression in vitro and in vivo.[11] Liver tissue samples of 30 mg were collected and rinsed in 5–10 mL of cold buffer (i.e., phosphate-buffered saline) and centrifuged at 10,000× g for 15 min at 4 °C to remove blood cells and clots for a subsequent test. Biochemical kits (Cayman Chemical Co., Ann Arbor, MI, USA) were used to determine the hepatic reduced glutathione (GSH) concentration, glutathione peroxidase

(GPX), glutathione reductase (GR), superoxide dismutase (SOD), and catalase (CAT) activities.[13] Several studies showed that anti-oxidative effects have partially contributed to the protection of PG and its ginsenosides against CP-induced nephrotoxicity. First, ginsenosides attenuate CP-induced nephrotoxicity by directly reducing the excessive production of reactive oxygen species (ROS) or indirectly alleviating the excessive production of ROS via inhibiting levels of Cytochrome P450 E1 (CYP2E1) and HO-1. Ginsenosides Re and Rg5 played an anti-oxidative role by reducing CYP2E1 level and thus down-regulating the ROS level. Additionally, the overexpression of HO-1 is one of the causes of excessive ROS production. Ginsenoside Rh2 could partly reduce CP-induced nephrotoxicity by down-regulating CYP2E1 and HO-1 levels.[12] In addition, an antioxidant role through Nrf2 and levels of antioxidant enzymes such as glutathione peroxidase and superoxide dismutase are increased by ginseng. Ginsenosides inhibited myocardial injury through the increment of 6-keto-prostaglandin F1α and decreases of lipid peroxidation.[13]

Cardiovascular effects of ginseng

Cardiovascular disease (CVD) is an important problem among the 400 million indigenous populations around the world, and have been included in the World Health Organization '2008-2013 Action plan for no communicable diseases.[14] Aging is associated with various, complicated and changes in cardiovascular structure and function. The heart becomes slightly hypertrophic and has a dampened response to sympathetic stimuli, including increase in heart rate and myocardial contractility. The aorta and central elastic arteries become dilated and stiff, exhibiting enhanced pulse wave velocity, endothelial dysfunction and biochemical transformation that resembles early atherosclerosis. To compensate for the decrease in arterial compliance and increase in peripheral resistance, the heart must pump with greater force. The myocardium responds in much the same way as other muscles do after exposure to increased load – enlargement and hypertrophy that result in a gradual increase in cardiac weight. There is a gradual decrease in cardiac myocytes, while remaining myocytes become hypertrophic and the myocardium shows increased levels of collagen.[2] Many cardiac protective effects of ginseng depend on the antioxidant properties of the ginseng components in cardiomyocytes.Total ginsenosides, especially panaxatriol, provided powerful protection against myocardial ischemia and reperfusion. Administration of total ginsenosides increased perfusion flow of the coronary artery dose-dependently, and this vasodilatory activity seemed to be mediated by activation of the phosphoinositide 3-kinase/protein kinase B-eNOS pathway.[13] PG antihypertensive effects are due to the promotion of vascular endothelial cell–

derived nitric oxide (NO) secretion via the conversion of L-arginine to L-citrulline by endothelial nitric oxide synthase (eNOS). In general, NO production is stimulated via eNOS, which is regulated by activation of androgen receptor and phosphatidylinositol-4,5-bisphosphate 3-kinase/protein kinase B (PI3K/Akt) and mitogen-activated protein kinase kinase/extracellular signal-regulated kinase pathways.[15] A recent study showed that KRG inhibited arginase activity, maintained nitric oxide (NO) generation, reduced ROS production, and increased eNOS coupling in aged mice.[2]

Anti-aging effect of ginseng on nervous system and motor function

Ginseng and its constituents are known to have the beneficial effects on central nervous system (CNS) disorders including the cognitive performance, memory, and neurodegenerative diseases. Ginsenosides Rb1 and Rg1 play a major role in neuroprotective effect. Rb1 was shown to increase the neuron cell survival and improve neurite growth. Rb1 protects hippocampal neuron from the ischemic damage and also delays the neuronal death from transient forebrain ischemia. Rg1 exerts a protective effect against the transient focal cerebral ischemic injury in rats with cerebral injury and also protects AB25-35-induced cortical neuron apoptosis through the down regulation of nuclear factor-kappa B (NF-κB)/nitric oxide (NO) signaling pathway. An increase of membranes fluidity was observed in both Rb1 and Rg1 experiments, Rb1 enhanced the membrane fluidity of cortical cells in rats, and Rg1 increased the fluidity of synaptosomal membranes impaired by FeSO4-cysteine.

Otherwise, ginsenosides Rd and Re also have neuroprotective properties. Ginsenoside Rd is shown to ameliorate ischemic stroke-induced damage and prolong the neural cells' survival through several mechanism, such as phosphoinositide-3-kinase/AKT and phosphoextracellular signal-regulated protein kinase (ERK) ½ pathways, suppression of the NF-κB, transient receptor potential melastatin, acid sensing ion channels 1a , poly(ADP-ribose) polymerase-1, protein tyrosine kinase activation, the up regulation of the endogenous antioxidant system, preservation of mitochondrial membrane potential, and reduction of cytochrome c-releasing and apoptosis-inducing factor.[17] Ginsenosides have a general stimulatory effect on the brain Ginsenoside Rb1 increased glutamate release in neurons via the PKA-dependent signaling pathway, whereas ginsenoside Rg1 induced glutamate release in a calcium/calmodulin-dependent protein kinase II (CaMKII) dependent manner Ocotillol is a derivative of pseudoginsenoside-F11, a ginsenoside found in American ginseng, and displayed excitatory effect on spontaneous action potential firing and depolarized the

membrane potential of mitral cells. Other studies showed that ginsenoside Rb1 inhibited the activity of L-type voltage gated calcium channels, without affecting N-type or P/Q-type Ca2+ channels in hippocampal neurons. Gintonin is a newly identified compound from ginseng that is found to activate G protein-coupled lysophosphatidic acid (LPA1) receptors with high affinity.[18] Ginseng is also considered to have stress-relieving properties. Its active component, ginsenoside, is similar in structure to estrogen. In immobilization (IMO) stressed mice, red ginseng administration prior to IMO stress down regulated peptidyl arginine deiminase type 4 (PADI4) through up regulation of the estrogen receptor (ER)β expression in the brain, which was in itself up-regulated by various stresses factors such as H2O2, acrylamide, and tunicamycin.[2]

Skin effect of ginseng

Skin, the organ that we are most familiar with in daily life, is also one of the most complex and largest organs in the body. It comprises at least three main layers: the epidermis, the dermis, and the subcutis.[16] The aging process is often visible in the skin. Several factors are involved in the aging of skin, including genetics, environmental stress, hormonal alterations and metabolism, oxidative stress all of which lead to accumulative transformations in skin constitution, function and appearance Panax ginseng and ginsenosides give effect to prevent aging of skin.[2]

Korean Red Ginseng (KRG) Can reduce the manifestation level of p53 and “growth arrest and DNA damage (GADD45)”induced by peroxynitrite (ONOO−) in HaCaT cells. ONOO− is a powerful biological oxidant, which can cause DNA damage. KRG can protect cells from ONOO—induced genotoxicity and repair the DNA damage by increasing cell viability and modulating p53 signaling.[16] TGS was provided by the Korea Ginseng & Tobacco Central Research Institute (Daejeon, Korea). The provided TGS contained 11 glycosides known as ginsenosides: Rb1 (15.82%), Rb2 (7.79%), Rc (8.06%), Rd (7.57%), Re (3.21%), Rf (4.72%), Rg1 (1.91%), Rg2 (22.08%), Rg3 (24.06%), Rh1 (4.63%), and Rh2 (0.15%). The TGS (20 mg/mL) was dissolved in saline and administered once subcutaneously prior to making the surgical skin wound in the treated group.[19]

CONCLUSION

Aging is a complicated process with multiple modulations being at numerous situations, from the molecular to the cells. Ginseng, an ancient Chinese condiment extensively used in Eastern drug, has-been studied for itsanti-aging properties., and has been shown to have salutary

goods with respects to anti-inammation,anti-oxidation, cardiovascular regulation, neurological enhancement,anti-tumor, skin protection and vulnerable modulation. The substantiation on the life- dragging goods of ginseng remains shy, and farther studies are recommended. Examinations integrating wisdom and technology will be demanded to further explore the goods of ginseng on the mortal body to completely understand its eventuality.[2]

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