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THERAPEUTIC POTENTIAL OF PANAX GINSENG AND GINSENOSIDES

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Introduction. For many many thousand years, mankind has been using various plants as nutrient,beverage, cosmetics, dye and medicine to maintain health and to improve quality of life. In Aisa, particularly, Panax ginseng C.A. Meyer is considered to be the most precious plant among herbs, and ginseng has been in the spotlight worldwide. Even in the Western world, where there are greatly advanced research facilities and highly qualified man-power available, and are regarded to be capable of conquering any hard-to-cure ailments, many peoples has recently been reported to use herbal medicine, particularly ginseng. Ginseng, a medicinal herb, has long been used in the Far East, particularly in Korea and China as a respected herbal medicine in maintaining physical vitality. The genus name Panax (Pan=all + axos=medicine) means 'cure all'in Greek. The herbal root is so named as ginseng, because it is shaped like a man, and is believed to embody his three essences (i.e. body, mind and spirit) and is known as the lord or king of herbs. Ginseng had been used mainly as a tonic to invigorate weak bodies, but only rarely as a curative medicine, although, according to the Bancao Gangmu (Encyclopedia of Herbs) written by Li Shizhen in China, 1596 A.D., it was included as an ingredient for curing 23 diseases. It is also included in 653 (16.6%) of the total 3,944 prescriptions in Dongeui Bogam (Korean Clinical Pharmacopoeia), written by the Korean herbalist, Huh Joon.

Aim. In this perspective we consider the therapeutic potential of Panax ginseng.

Materials and methods. Analysis of the scientific literature and the results of advanced research in the field of medicine and pharmacology.

Results and discussion. Panax is a perennial plant indigenous to the mountainous forests of the northern temperate zone of Eastern Asia and is cultivated in China and Korea. It has a thick, spindle-like brown-yellow root, often divided at the end. The simple glabrous stem bears a whorl of three or five palmately compound leaves consisting of five oblong-ovate, finely double-serrate leaflets. From June to August it is topped with a single umbel of greenish-yellow flowers. The fruit is a small edible drupe-like pale red berry. The activity of young cultivated roots is said to be up to half that of old roots grown in the wild. Commercially produced Panax is either grown as undergrowth in shady forests, or shaded by mats in the open. Two forms are available, - 'white' Ginseng (often with the outer skin peeled off) and 'red' ginseng, prepared by steaming the root before drying. Red ginseng contains all the saponins so far isolated from white ginseng, and others which are probably formed during the steaming process.

Ginseng has a sweetly aromatic flavour. The ginseng root has long been used as a valued tonic herb in China, called "root of heaven." The Chinese regard ginseng as a panacea for illness, though it was usually used in a preventive rather than a curative manner. In China, ginseng is mainly produced in Hu Bei,Hu Nan, Hebei, Heilongjiang, Jilin, Liaoning and other provinces.

Pnax ginseng contains Ginsenoside Ro;Ginsenoside Ra1;Ginsenoside Ra2; Ginsenoside Ra3; Ginsenoside Rb2; Ginsenoside Rb3; Ginsenoside Rc; Ginsenoside Rd;Ginsenoside Rg3; Ginsenoside R1; Ginsenoside R2; maloney-ginsenoside Rc; maloney-ginsenoside Rd; Ginsenoside Re; Ginsenoside Rf; Ginsenoside Rg2; Ginsenoside Rh1; 20-glucoginsenoside Rf; notoginsenoside R1; notoginsenoside R4. Panax ginseng contains organic acids including cis-butendicarboxylic acid; citric acid;malic acid;maleic acid; succinic acid;fumaric acid; salicylic acid; tartaric acid; vanillic acid; p-hydroxycinnamic acid; oleic acid; linolenic acid;linoleic acid; palmitic acid; palmitoleic acid; palmitin; pyruvic acid; linolein; alpha-dipalmitin; gamma-dipalmitin; panax acid,etc. Panax ginseng contains saccharides including glucose;fructose;galactose;arabinose;rhamnose;sucrose;xylose;maltose;mannose;raffinose;panose A;panose B;panose C;panose D;panaxan A;panaxan B;panaxan C; panaxan D; panaxan E; panaxan F; panaxan G; panaxan H; panaxan I; panaxan J;panaxan K;panaxan M;panaxan N;panaxan O;panaxan P;panaxan Q;panaxan R;panaxan S; panaxan T; panaxan U; Water soluble Polysaccharides(38.7%) and Alkaloids soluble Polysaccharides 7.8%~10.6%;80% of these saccharides are panax starch,20% are panax pectin;panax pectin composed of Acidic Heteropolysaccharide A and Acidic Heteropolysaccharide B.

Wild ginseng is called mountain ginseng,while cultivated ginseng is known as garden ginseng. In Germany, ginseng is one of a few economically important herbal drugs listed separately in the Foreign Trade Statistics. In 1992, Germany imported 174.6 tons, mainly from China and Hong Kong. A considerable amount of the roots are value-added in Germany and then exported mostly to France,Italy,and Argentina. Ginseng is official in the German Pharmacopoeia, approved in the Commission E monographs, and used in geriatric remedies,roborants,and tonic preparations.The Commission E specifies powdered root or tea infusions. In the United States,it is used by itself and as a main ingredient in a wide range of tonic,energy,and immunostimulant dietary supplements. It is also used extensively in traditional Chinese medicine herbal teas and other fluid or solid forms prescribed to patients by licensed acupuncturists and naturopathic physicians. During the past fifty years, numerous scientific studies of varying quality have been published on ginseng . Modern human studies have investigated its preventive effect on several kinds of cancer, its effect on newly diagnosed non-insulin-dependent diabetes mellitus patients, its long-term immunological effect on HIV patients, its ability to treat "qi-deficiency" and blood-stasis syndrome of coronary heart disease and angina pectoris, its ability to treat hepatotoxin-induced liver disease in the elderly, its effect on cell-mediated immune functions in healthy volunteers, its ability to induce a higher immune response in vaccination against influenza , its effect on blood pressure in patients with hypertension, its effect on alveolar macrophages from patients suffering with chronic bronchitis, its ability to treat severe chronic respiratory diseases, its use in the treatment of functional fatigue, its ability to improve quality-of-life in persons subjected to high stress, its effect on psychomotor performance in healthy volunteers, its effect on physical performance during exercise, its ability to treat erectile dysfunction, and its ability to treat male infertility. Some clinical trials have suggested the use of ginseng for fatigue and the improvement of physical and mental performance. Ginseng has been studied for treatment of cerebrovascular insufficiency, psychophysical asthenia and depressive symptoms, immunomodulation. Trials have also reported favorable results in treating post-menopausal symptoms and improving athletic performance. A review in a popular newsletter has raised questions regarding the design and results of some of these studies. Several recent trials have reported negative results for improvement of performance during aerobic exercise and in the secondary treatment of geriatric patients. Many of the clinical studies published in the scientific literature have been conducted on a proprietary extract of P. ginseng standardized to 4% total ginsensenosides. There have been four studies conducted on G115 to measure the effect of ginseng on endurance and vitality. Three studies have been conducted on psychoasthenia. Ten clinical trials have attempted to determine if ginseng affects physical stress and psychomotor functions . Two clinical trials have investigated cerebral blood flow deficits. Two studies on pharmacodynamics measured the immunomodulatory effects, oxygen uptake , doping substances in urine, and serum glucose, serum cholesterol, and serum triglyceride levels.

Conclusions. Panax is an adaptagenic herb - it enhances the body's resistance to external stresses and improves physical and mental performance. It acts on the central nervous, cardiovascular and endocrine systems, promotes immune function and metabolism, and has biomodulation actions. The hormone-like substances in the plant account for its simultaneous sedative and stimulating (adaptogenic) effect on the central nervous system. Panax improves the responses of the adrenal cortex in secreting the stress hormones possibly by interacting with receptor sites at the cortex and at the hypothalamus, variously stimulating and relaxing the central nervous system, affecting hepatic metabolism and glycogen utilisation by skeletal muscle. It has been found to have a beneficial effect on carbohydrate tolerance in diabetic patients. In general, Panax improves the balance of functions in the body. It is a valuable general plant drug for geriatric care. In China, it is also used during labour. As a demulcent, it is helpful for coughs, colds and various chest problems. Enhanced blood alcohol clearance has also been demonstrated.