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The Power of Natural Chinese Medicine, Ginger and Ginseng Root in an Organic Life

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Abstract: Traditional Chinese Medicine (TCM) as an important component of complementary and alternative medicine, evolved over thousands of years. Ginger and its general compounds such as Fe, Mg, Ca, vitamin C, flavonoids, phenolic compounds, sesquiterpenes, paradols has long been used as an herbal medicine to treat various symptoms including vomiting, pain, cold symptoms and it has been shown to have anti-inflammatory, anti-apoptotic, anti-tumor activities, anti-pyretic, anti-platelet, anti-tumourigenic, anti-hyperglycaemic, antioxidant anti-diabetic, anti-clotting and analgesic properties, cardiotonic, cytotoxic. It has been widely used for arthritis, cramps, sprains, sore throats, rheumatism, muscular aches, pains, vomiting, constipation, indigestion, hypertension, dementia, fever and infectious diseases. Ginger leaves have also been used for food flavouring in Traditional Chinese Medicine. Pharmacological activities of ginseng extracts are effects on the central nervous system; antipsychotic action; tranquilizing effects; protection from stress ulcers; increase of gastrointestinal motility; anti-fatigue action; endocrinological effects; enhancement of sexual behaviour; acceleration of metabolism; or synthesis of carbohydrates, lipids, RNA and proteins. In Traditional Chinese Medicine, ginseng can help to maintain a healthy immune system. The obtained findings suggest potential of ginger extract as an additive in the food and pharmaceutical industries to have on organic life.

Key words: Ginger · Ginseng · Traditional Chinese Medicine · Organic Life

INTRODUCTION

Ginger Potential Health Benefits and Pharmacological Uses in TCM and Modern Medicine Industry: Traditional Chinese Medicine (TCM) originates in ancient China with a 5000-year history. Rooted in ancient Eastern philosophies such as Taoism, TCM focuses on a holistic view between humans and nature [1, 2]. About 5000 traditional remedies are available in China; they account for approximately one fifth of the entire Chinese pharmaceutical market. Ginger has direct anti-microbial activity and thus can be used in treatment of bacterial infections [3]. In Traditional Chinese Medicine, it is employed in colic and in atonic dyspepsia and used as a stimulant [4, 5]. Ginger is regarded as a Yang herb, which can decrease Yin and nourish the body [6]. Mishra *et al*. [7] also revealed that ginger in Traditional Chinese Medicine, characterized as spicy and hot and it is claimed to warm the body and treat cold extremities, improves a weak and tardy pulse, address a pale complexion and strengthen the body after blood loss. In Traditional Chinese Medicine as herbal therapy against several cardiovascular diseases [8]. Based, on the historical usage of ginger as an antiemetic agent in the East Traditional Medicine. The antiemetic effect of ginger has been known as a treatment method in traditional medicine especially the Chinese and Iranian Medicine [9, 10]. Sharma [4] explained that many of herbs and plant extracts such as ginger is based on what has been used as part of Traditional Medicine Systems and there is a large body of anecdotal evidence supporting their use and efficacy. Some other researchers emphasized that ginger plays an

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important role in Ayurvedic, Chinese, Arabic and African traditional medicines used to treat headaches, nausea, colds, arthritis, rheumatism, muscular discomfort and inflammation [11, 12]. Recently, ginger rhizomes are used in Traditional Medicine as therapy against several cardiovascular diseases such as hypertension [13]. Niksokhan *et al.* [14] reported that ginger has been used in Traditional Medicine of Iran as an anti-edema drug and is used for the treatment of various diseases including nausea, gastrointestinal disorders, respiratory disorders, athero-sclerosis, migraine, depression, gastric ulcer, cholesterol; and other benefits of ginger are reducing pain, rheumatoid arthritis, anti-inflammatory and antioxidant effects. Oludoyin and Adegoke [15] reported that ginger is a perennial plant with narrow, bright green, grass-like leaves and it is cultivated in the tropics for its edible rhizomes and has been found to be useful for both culinary and medicinal purposes. Similarly, the medicinal uses of ginger are enormous such as exert anti- microbial, anti- nausea [16], anti-pyretic [17], analgesic, anti-inflammatory, hypoglycaemic [18, 19], anti-ulcer, antiemetic [20], cardio tonic, anti-hypertensive [21], hypolipidemic [22], anti-platelet aggregation [23] effects in both laboratory animals and human subjects. Turmeric is one of the main ingredients for curry powder and used as an alternative to medicine and can be made into a drink to treat colds and stomach complaints [24]. Furthermore, there are many studies that proved their beneficial effects against the symptoms of diseases, acting as anti-inflammatory, anti-tumour, anodyne, neuronal cell protective, anti-fungal and anti-bacterial agent [25]. Various ginger compounds and extracts have been tested as anti-inflammatory agents, where the length of the side chains determines the level of the effectiveness [26]. But, a combination of ginger extracts is more effective in decreasing inflammatory mediators than an individual compound [27]. The active ingredients in ginger are thought to reside in its volatile oils [28]. The major ingredients in ginger oil are bisabolene, zingiberene and zingiberol [29]. Some other scientists noted that the interest in ginger is endorsed to its several biologically active compounds content such as gingerol, shogaols, gingerdiol, gingerdione, α-zingiberene, curcumin and β-sesqui-phellandrene [30]. Ginger has been part of the folk medicine and popular nutraceuticals [26]. Ginger consists of a complex combination of biologically active constituents, of which compounds gingerols, shogoals and paradols reportedly account for the majority of its anti-cancer inflammatory properties [31]. Maghbooli *et al*. [32] confirmed the efficiency of ginger powder in the therapy of common migraine attacks and its similarity to the antiepileptic drug. Many studies have reported that Ginger has useful effects to cancer prevention [33], also treatment of nausea and vomiting due to pregnancy and chemotherapy [34, 35]. Also, it has been reported that ginger lowers blood pressure through blockade of voltage dependent calcium channels [21]. Adib Rad *et al*. [36] found that Ginger reduced menstrual pain and it is effective in relieving pain in girls with primary dysmenorrhea; moreover, Drozdoz *et al.* [37] mentioned that Ginger is a safe drug with minimal side effects. Singara *et al*. [38] reported that ginger is an effective non pharmacological option for treating hyperemesis gravidarum with respect to the inherent heterogeneity of the available studies. Gholampour *et al*. [39] found that ginger extract appears to exert protective effects against ferrous sulphate-induced hepatic and renal toxicity by reducing lipid peroxidation and chelating iron. Yilmaz *et al.* [5] found the positive effects of ginger in folliculogenesis and implantation. They have also found that ginger may enhance implantation in rats in long term with low dose. In other studies, the favourable outcomes have been reported on the positive effects of ginger on male infertility and sperm indices [40]. Islam *et al*. [41] boiled ginger extracts can be used in food preparation as well as against pathogenic bacteria during active infection. Viljoen *et al.* [42] suggested potential benefits of ginger in reducing nausea symptoms in pregnancy. They have found that ginger could be considered a harmless and possibly effective alternative option for women suffering from nausea and vomiting during pregnancy (NVP). Yadav *et al.* [43] demonstrated that ginger is one of the most commonly used spices and medicinal plants and it is effective to improve dietinduced metabolic abnormalities, however the efficacy of ginger on the metabolic syndrome associated kidney injury remains unknown. Gagnier *et al*.[44] provide an excellent framework for the development of future trials that focus on providing satisfactory answers to issues relating to the efficacy of *Z. officinale* to ameliorate different types of pain, as well as, dosing strategies, treatment duration, safety and cost effectiveness.

Ginseng Potential Health Benefits and Pharmacological Uses in TCM and Modern Medicine Industry: *Panax ginseng* (Giseng) is well-known herb in traditional Chinese medicine (TCM) [45]. In traditional Chinese medicine (TCM), it is believed that food and medicine come from the same origin but with different uses and applications [46, 47].

Panax ginseng is constituted of organic (80%-90%) and inorganic substances (approximately 10%) and consists of a number of active constituents, such as saponins or ginsenosides, carbohydrates, nitrogenous substances, phytosterol, essential oils, organic acids, amino acids, peptidoglycans, carbohydrate, nitrogen-containing compounds, fatty acids, vitamins, minerals and other phenolic compounds [48, 49]. Ginsenosides are classified into two main groups known as protopanaxadiol (PPD) and protopanaxatriol (PPT), based on the hydroxylation pattern at C6 and attachment of sugar moieties [50]. Patel and Rauf [51] also mentioned antioxidant, anti-inflammation, anti-fatigue, anti-diabetic, anti-tumor, immunomodulation, anti-obesity, cardioprotective, anti-microbial, neuroprotective and aphrodisiac properties. They have presented the potential of ginseng as a complementary and alternative medicine (CAM). Ginseng polysaccharides are composed of starch-like glucan and pectin with pectin accounting for around 20% of water-soluble polysaccharides [52]. A lot of studies have been conducted on the pharmacological properties of Ginseng extract such as lipid-lowering, anti-allergic, anti-diabetic, anti-inflammatory, hypoglycemis and anti-stress, anti-aging, anti-diabetic, anti-carcinogenic, anti-fatigue, anti-adhesive, anti-depressive, hypocholesterolemic and hypolipidemic, hepatoprotective activities, immune-modulatory activities, improving working memory and perceptual systems, stimulation and inhibition of central nervous system and inhibiting the growth of tumor cells, especially in female reproductive system [53-55]. Uluisik and Keskin [55] *Panax ginseng* root powder may be useful for hepatic damage and fibrosis associated with high cholesterol diet. These beneficial effects of ginseng on liver enzymes attributed to its active components known as ginsenosides. Lee and Rhee [56] reported that the potential use of ginseng in the prevention and treatment of chronic inflammatory diseases such as diabetes, rheumatoid arthritis and allergic asthma. In TCM practice, White ginseng and red ginseng are used for different purposes; white ginseng is used to supply qi and promote the production fluids of body fluids as well as enhance physical fitness and disease resistance, while red ginseng has a warming effect and is used for boosting yang and replenishing vital essence [57]. Xu *et al*. [58] reported that both white and red ginseng is the most widely used in clinical applications because of their considerable pharmacological activity. But, red ginseng exhibits more potential anticancer activity than white ginseng likely because of the abundant amount of rare ginsenosides generated from processing such as ginsenosides Rg3 and Rh2 [59]. As white ginseng and red ginseng possess different bioactivities and clinical purposes, discrimination of the white one and the red one are very significant for quality control, standardizing the processing procedures, as well as the effective and safe usage of ginseng [60]. Horacek *et al*. [61]explained that red ginseng is steam-cured after harvesting, thereby producing a glossy reddish-brown color, then dried. Steaming the root is believed to change its biochemical composition and to prevent the breakdown of bioactive ingredients and is therefore the preferred ginseng product. White ginseng is peeled and dried after harvest. Enzymes in the ginseng root are assumed to break down bioactive constituents during drying, so that white ginseng contains fewer bioactive components than red ginseng [61]. During the steaming process, extensive conversion of original ginsenosides in white ginseng to degradation compounds in red ginseng was observed, leading to different ginsenoside profiles [62].

Ginsenosides and phenolics in ginsengs are among the most important health-beneficial compounds in Asian ginseng [63]. Kim *et al.* [64] noted that the main ginsenosides are glycosides that contain an aglycone with a dammarane skeleton and include protopanaxadiol-type saponins such as ginsenosides Rb1, Rb2, Rc and Rd, as well as protopanaxatriol-type saponins such as ginsenosides Re and Rg1, constituting more than 80% of the total ginsenosides. Ginseng effectively prevents liver injury, mainly through down regulation of oxidative stress and inflammatory response [65]. Fatmawati *et al.* [66] also reported that P. ginseng might be an important herbal medicine in preventing diabetic complications. Van Kampen *et al*. [67] discovered that ginseng extract maybe a potential neuroprotective therapy for the treatment of Parkinson. Choi *et al.* [68] reported that Korean and Chinese ginseng reduced systolic and diastolic BP and red ginseng reduced headache symptoms. American ginseng showed anti-hypertensive effect on diastolic BP and reduced headache symptom. However, there was no statistical significance in the between-group analysis. Lee *et al.* [69] demonstrated that ginseng effectively reduces adipose tissue and prevents obesity in diet-induced obese mice that this process may be mediated in part through the anti-angiogenic actions of ginseng. Rocha *et al*. [70] found that P. ginseng is effective in the control of abdominal pain in irritable bowel syndrome patients, analogous to trimebutin. Wang and Ng [71] reported that the ribonuclease isolated from Chinese ginseng flowers; the root ribonuclease exhibits

antifungal activity and inhibitory activity toward HIV-1 reverse transcriptase. Shin and Yoon [72] demonstrated that ginseng may be able to prevent obesity, hyperlipidemia and hepatic steatosis in men with testosterone deficiency. Gray *et al.* [73] found that ginseng protects against chromatin damage and thus maybe beneficial to reproductive fitness. Lee and Oh [74] revealed that when red ginseng is administered over long periods, age-related decline of learning and memory is ameliorated through anti-inflammatory activity. Sharma and Goyal [75] also insist on potential role of *P. ginseng* to become a pivotal chemo-preventive agent that can reduce cancer in mammals. Hwang *et al.* [76] concluded that *P. ginseng* can prevent aging by inhibiting wrinkle formation and increasing moisture in the human skin. Park *et al*. [77] reported that Korean Red Ginseng has beneficial effects on chronic liver disease, a condition encompassing non-alcoholic fatty liver disease, alcoholic liver disease, chronic viral hepatitis and hepatocellular carcinoma.

CONCLUSION

In order for Chinese medicine and in particular, Traditional Chinese Medicine (TCM), to become more integrated into medical practice in the West, there is a need to bridge the many conceptual and practical differences between Western medicine and Chinese medicine. Fresh ginger has been used for treatment of nausea, cold-induced disease, colic, asthma, cough, heart palpitation, swellings, dyspepsia, loss of appetency and rheumatism. Medicinal properties associated with ginger are, anti-inflammatory properties, anti-thrombotic properties, cholesterol-lowering properties, blood pressure-lowering properties, anti-microbial properties, anti-oxidant properties, anti-tumor properties and hypoglycaemic properties. Consumption of ginger also has beneficial effects on heart disease, cancer, hypertension, obesity, diabetes, osteoarthritis and bacterial infections. Ginger is an herbal, easily available, low price medication which is associated with low risk can be substituted for chemical, scarce and expensive drugs. Red Ginseng is known to possess various biological activities including boosting the immune system, improving the blood circulation, enhancing memory, antifatigue effects, antioxidant effects and positive effects on menopausal disorder. Ginseng contains saponing, an element of glycosides; nitrogenous compounds such as protein, amino acid, nucleic acid and alkaloid; fat-soluble ingredients such as fatty acid, ethernal oil, polyacetylene, phenolic compound, phytosterol and terpenoid; sacchardies such as monose, oligosaccharide, polysaccharide and pectin; vitamins and inorganic substances; and many other useful ingredients. Several pharmacological activities have been reported for ginseng extracts including effects on the central nervous system; antipsychotic action; tranquilizing effects; protection from stress ulcers; increase of gastrointestinal motility; anti-fatigue action; endocrinological effects; enhancement of sexual behaviour; acceleration of metabolism; or synthesis of carbohydrates, lipids, RNA and proteins. The chemical compositions of white and red ginseng are different, white ginseng and red ginseng are used for different purposes; white ginseng is used to promote the production fluids of body fluids as well as enhance physical fitness and disease resistance, while red ginseng has a warming effect and is used for replenishing vital essence. Herbal remedies and other nutraceuticals are increasingly and extensively used by a substantial part of the population. To sum up, treatment with natural herbal medicine especially ginger and ginseng as non-synthetic drug, is recommended.

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