Clinical/Scientific evidence of Claims in Sibu Beauty products:

Sea Buckthorn Powder – internal (Revitalize & Renew)

ANTI-OXIDANT/CARDIOVASCULAR/LIVER HEALTH/IMMUNE FUNCTION

"Has antioxidant activity. Improves heart function and cardiovascular condition. Modulates immune function." (Structure-Function) [Gou and Li, 1990; Wang, 1994, 1993a, 1993b; Wang et al, 1994; Wang and Wang, 1993; Wang and Zaong, 1985; Eccleston et al, 2002; Hibasami et al, 2005;Cao et al, 2003; Wang et al, 2001; Zhang et al, 2001; Zhong, 1989; Bernath and Foldesi, 1992; Dorhoi et al, 2006; Mishra et al, 2008; Gao et al, 2003;]

Sea buckthorn (Hippophae rhamnoides L.), a thorny shrub of Elaeagnanceae family with very high nutraceautical and therapeutical values, is grown in Asia, Europe and North America. On the Canadian plains more than 250, 000 mature sea buckthorn shrubs have been planted mainly for shelterbelts, wildlife habitat and land reclamation (Li and Schroeder, 1996). The most valuable part of the plant is its berries, with a long history of application in Tibetan and Mongolian medicines. Being a good source of bioactive phytochemicals, sea buckthorn berries have been processed by hundreds of industries in China and Russia for nutraceutical and cosmaceutical products (Arimboor et al, 2006). Since 1977, sea buckthorn berry has been listed as a medicinal ingredient in the Chinese Pharmacopeia (Yang and Kallio, 2002).

Sea buckthorn fruit has been shown to have a potent antioxidant activity, mainly attributed to its flavonoids and vitamin C content.

The effects of sea buckthorn flavonoids on free radical scavenging, lowering blood viscosity, and enhancement of cardiac function have been studied in many clinical trials, animal and in vitro studies (Gou and Li, 1990; Wang, 1994, 1993a, 1993b; Wang et al, 1994; Wang and Wang, 1993; Wang and Zaong, 1985). In placebo controlled trial of 20 healthy men conducted by Eccleston et al (2002), ingestion of sea buckthorn juice for eight weeks did not significantly change plasma total cholesterol or LDL-C levels when the treatment groups were compared. However, there was a moderate increase in plasma HDL-C (20%) and triacylglycerol (TAG) (17%) concentrations. In healthy mice, flavonoids from sea buckthorn significantly reduced serum cholesterol and serum triglyceride levels (Hibasami et al, 2005;Cao et al, 2003). Gupta et al (2006) observed that sea buckthorn flavone possesses potent antioxidant properties as evidenced by significant increase in reduced glutathione (55.0%), vitamin C (70.0%) and catalase (20.0%) activities in wound granulation tissue in rats. The flavone treatment also resulted in significant decrease in lipid peroxide levels (39.0%).

Sea buckthorn fruits were shown to improve heart function. Wang et al (2001) in a small randomized, double-blind, placebo-controlled trial showed that a powdered extract of the fruit and leaf, standardized to total flavones, improves heart function. Zhang et al (2001) conducted a randomized trial to assess the effects of total flavones of Hippophae rhamnoides L (TFH) on sympathetic nerve activity in essential hypertensive patients and to determine whether TFH possesses inhibitory effects on sympathetic activity after supine isometric exercise. The subjects were randomly divided into a TFH group (N=35), a calcium antagonist nifedipine group (N=33), and a verapamil ER (N=20) group. The primary outcome measures included heart rate, blood pressure, and plasma

catecholamines. After eight weeks of treatment, TFH did not alter the heart rate at rest or plasma catecholamine concentration in the patients ($p>0.05$). In contrast, nifedipine produced an increase of noradrenaline and adrenaline level ($p<0.01$). After exercise, heart rate, blood pressure, and plasma catecholamine concentration significantly increased in the nifedipine group ($p><0.01$), but did not increase in the TFH group. In the verapamil group, the plasma catecholamine concentration did not change after treatment, but it was significantly increased after isometric exercise. The authors noted that the results suggest that TFH does not alter the sympathetic activity in treatment of hypertension and the inhibitory effect of TFH on sympathetic activity after supine isometric exercise may provide clinical benefits. >
The effects of sea buckthorn on immune functions have been investigated mostly using experimental models in animals. Various investigators have shown than sea buckthorn extract promotes non-specific immunity (Zhong, 1989; Bernath and Foldesi, 1992). Dorhoi et al (2006) in their study assessed the standardized ethanol extracts of Allium sativum (garlic), Glycyrrhiza glabra (licorice), Plantago major (plantain) and Hippophae rhamnoides (sea buckthorn) for their effects on cellular immunity in laying hens. Dual effects on circulating phagocytes were revealed for sea buckthorn, and high concentrations of sea buckthorn (400 microg/mL) inhibited leukocyte proliferation. Mishra et al (2008) evaluated the immunomodulatory activity of ethanolic solution of SBT flavone (FLV) in human peripheral blood mononuclear cells (PBMCs). The SBT flavone was found to stimulate production of interleukin-6 (IL-6) and tumor necrosis factor-alpha"(TNF-alpha) in PBMCs. However, increased expressions of p-IkappaB, NF-kappaB, and p-p38 were found in flavone-treated human PBMCs with significantly suppressed expression of CD25 (IL-2R). These observations suggest that stimulation of IL-6 and TNF-alpha secretion may contribute to the putative beneficial effects of dietary flavone against microbial infection.

Clinical studies have also been conducted in patients with liver cirrhosis (Gao et al, 2003). Forty-eight cirrhotic patients were randomly divided into treated or control groups. The treated group was given 15g of sea buckthorn extract by mouth 3 times daily for 6 months. Cytokines and various blood parameters of liver fibrosis and liver function test were evaluated. Sea buckthorn treated patients had reduced serum levels of laminin, hyaluronic acid, total bile acid, and collagen types III and IV, suggesting that the sea buckthorn extract my be useful for the treatment and prevention of liver disease.

In conclusion there is evidence from clinical trials, animal and in vitro studies that Sea Buckthorn has antioxidant activity, improves heart function and cardiovascular condition, and modulates immune function.

PHARMACODYNAMICS

Sea-buckthorn berries are among the most nutritious and vitamin-rich fruits found in the plant kingdom. The vitamin C concentration in berries varies from 360 mg/100g of berries for the European subspecies rhamnoides (Rousi and Aulin, 1977; Plekhanova, 1988; Wahlberg and Jeppsson, 1990; 1992, Yao et al., 1992) to 2500 mg/100g of berries for the Chinese subspecies sinensis (Yang et al, 1988; Zhao et al, 1991; Yao and Tigerstedt, 1994). The carotene content ranges from 30 to 40 mg/100g of berries (Bernath and Foldesi, 1992; Wolf and Wegert, 1993). Vitamin E concentration can be up to 160 mg/100g of berries (Zhang et al, 1989; Ma and Cui, 1989, Eliseev, 1989; Wahlberg and Jeppsson, 1990, 1992). Sea-buckthorn is also rich in flavonoid (vitamin P) and contains appreciable amounts of water soluble and fat soluble vitamins (Zhang et al, 1989; Solonenko and

Shishkina, 1989; Schapiro, 1989). Sea-buckthorn berries contain up to 13% soluble sugars, mainly glucose, fructose and xylose, and 3.9% organic acids, mainly malic and succinic acid, (Ma and Cui 1989). Sea-buckthorn is rich in proteins and free amino acids. A total of 18 amino acids have been found in sea-buckthorn fruit (Zhang et al, 1989; Mironov, 1989). There are at least 24 chemical elements present in sea-buckthorn juice; eg. nitrogen, phosphorous, iron, manganese, boron, calcium, aluminum, silicon and others (Wolf and Wegert, 1993; Zhang et al, 1989; Tong et al, 1989). Flavonols, tocopherols and tocotrienols (vitamin E), and carotenoids, which are found in the leaves, fruit and juice of sea buckthorn, are noted for their antioxidant activity (Gao et al., 2000).

REFERENCES

Arimboor R, Venugopalan VV, Sarinkumar K, Arumughan C, Sawhney RC. Integrated processing of fresh Indian sea buckthorn (Hippophae rhamnoides) berries and chemical evaluation of products. J Sci Food Agric. 2006; 86:2345-2353.

Bern"th J, F"ldesi D. Sea-buckthorn (Hippophae rhamnoides L.): a promising new medicinal and food crop. J Herbs, Spices and Medicinal Plants. 1992; 1(1/2): 27-35.

Cao Q, Qu W, Deng Y, Zhang Z, Niu W, Pan Y. [Effect of flavonoids from the seed and fruit residue of Hippophae rhamnoides L. on glycometabolism in mice]. Zhong.Yao Cai. 2003;26(10):735-737.

Dorhoi A, Dobrean V, Zahan M, Virag P. Modulatory Effects of Several Herbal Extracts on Avian Peripheral Blood Cell Immune Responses. Phytother Res. 2006; 20: 352-358.

Eccleston C, Baoru Y, Tahvonen R, Kallio H, Rimbach GH, Minihane AM. Effects of an antioxidant-rich juice (sea buckthorn) on risk factors for coronary heart disease in humans. J Nutr.Biochem. 2002;13(6):346-354.

Eliseev IP. Evolutionary genetic aspects in assessment of achievements and perspectives of sea-buckthorn selection in the USSR. Proc Int Symp Sea-buckthorn (H. rhamnoides L.), Xian, China, 1989; p. 184-193.

Gao X, Ohlander M, Jeppsson N, Bjork L, Trajkovski V. Changes in antioxidant effects and their relationship to phytonutrients in fruits of sea buckthorn (Hippophae rhamnoides L.) during maturation. J Agric Food Chem. 2000; 48: 1485-1490.

Gou H, Li G. The clearing effect of total flavonoids of Hippophae" rhamnoides on active oxygen radicals. J. Pharmacol. China 1990, 6.

Gupta A, Kumar R, Pal K, Singh V, Banerjee PK, Sawhney RC. Influence of sea buckthorn (Hippophae rhamnoides L.) flavone on dermal wound healing in rats. Mol Cell Biochem. 2006; 290(1-2):193-198.

Hibasami H, Mitani A, Katsuzaki H, Imai K, Yoshioka K, Komiya T. Isolation of five types of

flavonol from seabuckthorn (Hippophae rhamnoides) and induction of apoptosis by some of the flavonols in human promyelotic leukemia HL-60 cells. Int J Mol.Med 2005;15(5):805-809.

Li TSC, Schroeder WR. Sea Buckthorn (Hippophae rhamnoides L.): A multipurpose plant. HortTech. 1996; 6: 370-380.

Ma Z, Cui Y. Studies on the fruit character and biochemical composition of some forms within the Chinese sea-buckthorn (Hippophae rhamnoides ssp. sinensis) in Shanxi, China. Proc Int Symp Sea-buckthorn (H. rhamnoides L.), Xian, China, 1989; p. 106-112.

Mironov VA. Chemical composition of Hippophae rhamnoides of different populations of the USSR. Proc Int Symp Sea-buckthorn (H. rhamnoides L.) Xian, China, 1989; p. 67-69.

Nikulin AA, Iavorskii AN, Petrov VK, Tishkin VS, Rachkov AK. [Effect of sea buckthorn, dog rose and sperm oils, preparation "Spedian-2M" on several indices of carbohydrate metabolism and concentration of electrolytes in the tissues of rats and guinea pigs]. Farmakol.Toksikol. 1977;40(1):61-66.

Plekhanova MN. Sea-buckthorn. 1988; 77 p. (in Russian).

Rousi A, Aulin H. Ascorbic acid content in relation to ripeness in fruit of six Hippophae rhamnoides clones from Pyh”ranta, SW Finland. Ann Agric Fenn. 1977; 16: 80-87.

Saggu S, Divekar HM, Gupta V, Sawhney RC, Banerjee PK, Kumar R. Adaptogenic and safety evaluation of seabuckthorn (Hippophae rhamnoides) leaf extract: a dose dependent study. Food Chem Toxicol 2007;45(4):609-617.

Schapiro DC. Biochemical studies on some hopeful forms and species of sea-buckthorn in USSR. Proc Int Symp Sea-buckthorn (H. rhamnoides L.), Xian, China, 1989; p. 64-66.

Solonenko LP, Shishkina EE. Electrophoretic and amino acid analysis of proteins in the sea-buckthorn fruit. Proc Int Symp Sea-buckthorn (H. rhamnoides L.), Xian, China, 1989; p. 91-95.

Suomela JP, Ahotupa M, Yang B, Vasankari T, Kallio H. Absorption of flavonols derived from sea buckthorn (Hippophae rhamnoides L.) and their effect on emerging risk factors for cardiovascular disease in humans. J Agric Food Chem. 2006;54(19):7364-7369.

Tong J, Zhang C, Zhao Z, Yang Y, Tian K. The determination of the physical-chemical constants and sixteen mineral elements in raw sea-buckthorn juice. Proc Int Symp Sea-buckthorn (H. rhamnoides L.), Xian, China, 1989; p. 132-137.

Vijayaraghavan R, Gautam A, Kumar O, Pant SC, Sharma M, Singh S, Kumar HT, Singh AK, Nivsarkar M, Kaushik MP, Sawhney RC, Chaurasia OP, Prasad GB. Protective effect of ethanolic and water extracts of sea buckthorn (Hippophae rhamnoides L.) against the

toxic effects of mustard gas. Indian J Exp Biol 2006;44(10):821-831.

Wahlberg K, Jeppsson N. Development of cultivars and growing techniques for sea-buckthorn, black chokeberry, honeysuckle and rowan. Sverigges Lantbruksuniversitedt Balsg”rd-Avdelningenf”r Hortikulturell V”xf”r”dling, 1992.

Wahlberg K, Jeppsson N. Development of cultivars and growing techniques for sea-buckthorn, black chokeberry, Lonicera and Sorbus. Sverigges Lantbruksuniversitedt Balsg”rd-Avdelningenf”r Hortikulturell V”xf”r”dling Verksamhetsber”ttelse 1988-1989. 1990; p. 80-93 (in Swedish, summary in English).

Wang B, Feng Y, Yu Y, Zhang H, Zhu R. Effects of total flavones of Hippophae rhamnoides L. (sea buckthorn) on cardiac function and hemodynamics in healthy human subjects. 2001. Translation from the original Chinese provided by Rich Nature Nutroceutical Laboratories, Inc. Available at http://www.richnature.com/products/herbal/articles/heart.pdf. Accessed July 30, 2008.

Wang B, Li K; Qi Y. Effect of total flavonoids of Hippophae rhamnoides L. on frog heart in ViVo and toad heart in Vitro. Hippophae 1994, 7.

Wang B, Wang Y. Effect of total flavonoids of Hippophae rhamnoides L. on the cardiac function of guinea pig. Hippophae 1993, 6.

Wang B. Effect of total flavonoids of Hippophae rhamnoides L. on cardiac performance and blood stream dynamics of rabbit. Hippophae. 1993a, 6.

Wang B. The effect of total flavonoids of Hippophae” rhamnoides L. (TFH) on cardiac performance and hemodynamics of normal people. J. Xian Med. UniV. 1994, 14.

Wang B. The rheological effect of sea buckthorn total flavonoids on the blood of normal rats. North-West J. Pharm. 1993b, 8.

Wang J, Zaong M. Observation on the curative effect of sea buckthorn total flavonoids on ischemic heart disease. Shanxi Med. Res. (Sea Buckthorn) 1985.

Wolf D, Wegert F. Experience gained in the cultivation, harvesting and utilization of sea-buckthorn. In: Cultivation and Utilization of Wild Fruit Crops. Bernhard Thalacker Verlag GmbH & Co., 1993; pp. 23-29 (in German).

Yang B, Kalimo KO, Mattila LM, Kallio SE, Katajisto JK, Peltola OJ, Kallio HP. Effects of dietary supplementation with sea buckthorn (Hippophae rhamnoides) seed and pulp oils on atopic dermatitis. J Nutr Biochem. 1999; 10: 622-630.

Yang B, Kallio H. Composition and physiological effects of sea buckthorn (Hippophae) lipids. Trends Food Sci Tech. 2002; 13:160-167.

Yang H, Wang S, Su X. A study on the dynamic variation of ascorbic acid in Hippophae. Hippophae 1988; 4: 41-44 (in Chinese).

Yao Y, Tigerstedt PMA, Joy P. Variation of vitamin C concentration and character correlation between and within natural sea-buckthorn (Hippophae rhamnoides L.) populations. Acta Agric Scand. 1992; 42: 12-17.

Yao Y, Tigerstedt PMA. Genetic diversity in Hippophae L. and its use in plant breeding. Euphytica 1994; 77:165-169.

Zhang W, Yan J, Duo J, Ren B, Guo J. Preliminary study of biochemical constituents of sea-buckthorn berries growing in Shanxi Province and their changing trend. Proc Int Symp Sea-buckthorn (H. rhamnoides L.), Xian, China, 1989; p. 96-105.

Zhang X, Zhang M, Gao Z, Wang J, Wang Z. [Effect of total flavones of Hippophae rhamnoides L. on sympathetic activity in hypertension]. Hua Xi.Yi.Ke.Da.Xue.Xue.Bao. 2001;32(4):547-550.

Zhao H, Zhu C, Gao C, Li H, Liu Z, Sun W. Geographic variation of fruit traits of the Chinese sea-buckthorn and selection of provenances for fruit use. Hippophae 1991; 4:15-18. (in Chinese).

Zhong F. Effects of the total flavonoids of Hippophae rhamnoides on nonspecific immunity in animals. Shanxi medical journal 1989; 18: 9-10.