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The present situation of studies on effects of atitumor with health of Hippophae in the China

Soo-Cheol Kim[1], Sang-Lae Lee[2], Jin Dui-Lin[3]
[1]Agricultural College of Yanbian Univerisity, [2]Tokyo College of Pharmacy
[3]Tumen Animai and Plant Quaranting Service

ABSTRACT

As indicated by Chinese letters "沙棘" (sha-ji) is the ripe fruit of *Seabuckthron*(Hippophae rhamnoides Linneus) Family Flaeagnaceae is one of ancient natural medicine used by the Tibetan and Mongolian nationallites with ancient methods to treat desease. It is an effectiv Traditional Tibetan medicine. Bud only now are they beginning to be understood in the world of modern medicine. Hippophae was written in the book of Traditional Tibetan Medicine - "Somalaza" (8th century), "Sibuyidian" (1840) and "Jingzhubencao" (Qing Dynasty). The "Sibuyidien" was trnslated in to the Russian and published at 1903 in the Russian. Then the Russian bigan to study on Hippophae and they have achieved great successes. The Chinese scientists began to study on the chemical constituent and medical action with modern technique at 1952. With more than 40 years painstaking eport they have conceived and used a wide variety of experimental screening systems, achieved successes. Finally they with one' s own tests has heen verified that the crude drug being various kind of bioactive substance could inhibits tumor, increase immunity, wipe out free radical, prevent disease of cardiovascular system, have anti-radiation, anti-inflammeutory effects. At 1977 the Hippophae rhamnoides was written in Chinase Pharmacopoeia.

Key words : Hippophae ramnoides, Flaeagnaceae, Tranditional, Tibetan Medicine, antitumor, antisenility, antiinflammatory, antiradiation, immunity, cardiovascular system.

The botanical characteristic of the Hippophae

The Hippohae are distributed mainly over 27-68.5° N and 2-115° E in the aridity district. In the Chinese it are distributed over Northwest(including Shaamxi, Gansu, Qinghai, Ningzia and Xinjiang), North China(including Hebei, Shanxi, Beijing and Tianjin) and Southwest(including Sichuan, Yunnan, Guizhou and Tibet).

The genera of Hippophae including 4 species in the wordl. These 4 species can be found in the China.

Indented key to the species of the genus Hippophae

1. Fruit spheroidal or oblong and baccate seed cost black and glossy with 2-5mm in length.
2. Above of lamina with astral pile, back of lamina densely covered by pile of greyish-green and lack of scale hair(South Tibet).

   H.salicifolia D.Don

2. Above of lamina with silvery-white scale hai or astral hair back of lamina with silvery-white or pale brown scale hair.

Corresponding author: **Soo-Cheol Kim**, Agricultural College of Yanbian Univerisity, China

3. Tree or shrubs 1-5m in height, fruit 4-6mm in diameter, seed 2-4mm in length(Inmongolia, Shaanxi, Shanxi, Gansu and Sichuan) *H.rhamnoides Linn*

3. Shrubs 5-60cm in height, fruit 6-10mm in diameter seed 4-5mm in length(Qinghai, Tibet, Gansu, Sichan) *H.thibetana Schlecht*

1. Fruit cylindraceous or carnous and winding, with 5-7 in vertical ribbed, brown when ripe, seed cylindraceous, seed coat brown(Tibet, Qinghai) *H.neurocarpa S.w, Liu et T.N He*

Finland scientist *Arene Rousi*(1971) divide H.rhmnoides into 9 subspecies. And 5 subspecies of them can be found in the China as follow.

The key to the subspecies of H.rhamnoides in the China

1. Nially opposite phyllotaxis(Hebei, Inmongolia, Shanxi, Shaanxi, Gansu, Qinghai, Western Sichuan) *subsp chinensis Rousi*

1. Alternate phyllotaxis

2. Back of lamina with rusty scale, fruit spheroidal or oviform, 5-6mm in diameter(Sichuan, Yunnan) *subsp yunnanensis Rousi*

2. Back of lamina with silvery white scale hair

3. Fruit nearly spheroidal fruit stalk 2-4mm in length.

4. Ramul surface white, fruit stalk 3-4(7)mm in length(Xinjiang) *subsp turkestanica Rousi*

4. Ramul surface non-white, fruit stalk 1-4mm in length(Xinjiang) *subsp mongolica Rousi*

3. Fruit elliptical, fruit stalk 1mm in length(Tibet) *subsp gvantsensis Rousi*

Among these 4 species only Hippophae rhamnoides Linneus had written in Chinese Pharmacopoeia most important species of Hippophae. There are deciduons trees or shrubs with 1-5(18)m in height erinacoeus ramul brown-green with silvery. White or brown scale. Old twig greyish black. leaf linear and above of lamina with white scale densely covered. Petiolus 1.5mm in length. Diaecious. Flowers small, pale yellow. Perianth dicyclic with tube. above two-tobed. Hypogyny, one carpel as well as ovule. Nut is surrounded by a carnous perianth, drupe shape, spheroidal or oblong, orange color or orange-red when matured. Florescence April-May.

Fruitage August-October.

The available composition and its drug effect

According to literature the fruit included many kind of vitamins, microelements and bio-active substances. The organic acid make up 2-3.5% of the total weight of the fruit when matured. In chromatography tests showed that the organic acid contains malic acid and oxalic acid etc. These organic acid could alleviate toxic effect of barbatone, antibiotic substances, and other medicine. It could prevent damage, stress and nociceptiv of ray.

The carotinoide(including β and γ carotene, lycopene and zeaxanthin) contains 168-380mg/100g of the fruit. The content of vitamin C are 714-1907mg/100g of the fruit when matured. The vitamin E group including α, β and γ vitamin E contains 112-207mg/100g of oil of the fruit. Vitamin E and C used to anti-oxygen. The fruit also contains vitamin B group(incluing VB, VB2, and VB[3]), vitamin K, progesterone, flavoxaanthin and neorutin.[3]

The phosphatide(including lecithin, cephalin, phosphatidylinocitol) make up about 5% of total weight of the fruit. It has the effect of anti-fatty liver as well as antihepatocirrhosis. The content of betain make up 0.09-0.36% of the fruit. It could prevent atheroscleorsis.

The content of flavonoide in the fruit are 24-

854mg/100g. The flavonoide including leucoanthocyanin, cathechin, flavonol, flavonone, isorhamnetin, quassin and canelin, could increase turn oxidized vitamin C into deoxidized vitamin C, reduce cotent of cholesterol in the blood of hyperlipemia patients, has the function of antitumor, antiradiation, anti-inflammatory and antihyperthyroidism.[3]

The phenols derived from the fruit in tests shows antioxigen, antitumor and antiradiation effects.

The chlorogenic acid derived from the fruit could promote syntesis of gastric acid, stimulate the secretion of gastric juice and control the function of thyroid in similar wai of hypophysis.

The oil make up 6-8% of total weight of the sarcocarp and 8-18.8% of the seed. The palmatic acid and palmitolic acid make up about 60% of the oil. It is a part of unsaponification substances in the oil. The β-sitosterol are the main part of sterol. It could prevent and cure the atherosis. The serotonin derived from stem or fruit are and exeptionally substance in the all plant gingdom. It is exist in the state of chemical free or compound. It could make a neurotransmitter in the organism and regulate that sentiment state, bloot pressure, bodily temperature, hormone state and internal environment. It also have anti-tumor, anti-strong radius and anti-infectious disease effects.

The coumaline derived from the stem or leaf in tests shows antitumor, antileucoderma, antispasmophilia and cholagogic effects.

The β-amyrin derived from leaf could expansion the brain as well as cardiovascular system and promote blood circulation.

The ursolic acid make up 1.34-1.6% of the fruit, 0.47-0.68% of the seed and 0.29-0.3% of leaf[3]

The antitumor effects

The senility and develop of disease have connection with peroxidation of substance in the body. And so the blocking peorxidation as well as wipe out oxygen free radical is a point of study on antisenility.

Jin Yuehua from the Chinese Academy of Sciences reported that the fruit juice and extract derived from the leaf in tests shows a superoxid dismutae and could wipe out of free radical on the surface of cells in similar way vitamic C.[11]

Rui Lixin from the Shanxi University of Medicine reported that the oil of seed can wipe out lipoid perocid on the surface of red blood cells of the guine pigs.[2]

Ju Haisong from the lnmongolian University of Medicine reportes that the flavonide could wipe out active oxygen' s free radical as well as hydroxyl free radical in human polymorphonuclear leukocyte.[2]

The effect antiinflammatory and antiradiation

Xu Mingyu from the Academy of Traditional Chinese Medicine reported the oil of fruit in clinical application showed remarkably antiinflammatory as well as secretive effect. It also could improve the human bed sore when gave the oil of fruit to bed sore patients. After in animal tests they found that the oil can treatment inflammation induced by radiation.[3]

Jiang Zheng from the Chinese 2d Military Medical College in animal tests has been verified that the oil of seed could improve the model of the gastric ulcer induced acetic or chronic reserpine method. β-sitosterol-β-D-glucosid separated from the oil of seed have a remarkably healing effect of gastric ulcer.[2]

Wu Xiaru from the Xian University of Medicine reported that the oil of seed and suppository of oil has been used in clinlcall tests for the treatment of human chronic uteritis and showed remarkable effect with a total effective rate of 97%.[19]

Li Miningzhong in animal tests found that the oil of seed could cured esophagitis induced by the radiotherapy. Zhang Wenlu also has been verified that the oil could treat acute skin injury induced by the radiotherapy of cancer patients.[21]

Hao Wenming from the Shanxi Province Research

Institute of Medicine has been engaged in chronic toxicity tests of the oil of furit' s residue with rate, under a dosage of 18g/per Kg of body weight through per os-was 20 times as much as that of the clinical dosage. And he verified the oil nothing any effect of embriotoxictiy as well as teratogenesis and poisonous to the parent body.[26]

The efficary to cardiovascular system

Zhang Masoun from the Huaxi University of Medicine reported that the flavnoide could increase a volume of blood flow in the coronary artery and can remission angina pectoris.[12]

Wang Bingwen from the Xian University of medicine in animal tests has been verified that the flavonoide derived from the leaf could increase function of distole and systore.[9]

Liou Fengming from the Baotao University of Medicine in tests with heart excomatized from rate, had been verified that the flavonoid derived from the fruit could inhibits arrhythmia induced by aconitin.[10]

Cai Qiuyan from the Shanxi Province Research Institute of Medicine reported that the substance(SE) extracted with ethylalcohol from the fruit in animal tests shows an effect of antimyocardial ischemia as well as antihyperliperma. They also found that the oil of seed could reduced amount of colesterol in the blood of hyperlipoidemial patients.[2]

The immunity

Zhong Fei from the Nanking Lailway University of Medicine in animal tests has been confirmed that the extract(CEH) derived from the fruit juice have an effect of antianaphylaxis and could increase the macrophase phagostic function. It also could increase the amount of peripheric T-lymphocytes as well as amount of SRFC. They also has been verified that the CEH could antagonisted to immunosuppression induced by the cyclophosphamide and increase nonspecific. Immunity.[2]

Ren Lifeng from the Shanxi Province Research Institute of cancer in myeloid micronucleus tests with rate showed that the oil of seed, could increase the recovery ratio of immunosuppressional state of natural killer cells.[11]

Zhang Peizhen from Gansu Province Research Institute of cancer in animal immune tests they found that the oil of seed could promote the macrophase phagocytic function. They also has been verified that the macrophase phagocytic function. They also has been verified that the fruit juice can promote macrophase phagocytic function of affected rate by B-16.[13]

Li Diandong from the Chinese Academy of Medicine in animal tests by the polymerase chainreaction technique when taken orally, the fruit juice show that the juice could increase index number of splenic lymphocytes as well as active of interleukin-2(IL-2) of the mouse.

LITERATURE CITED

1) Zhou Yonghan, Resource science of Chinese medicinal materials 1993:397~401.
2) Ma Yingcal, An academic paper on the Seabuckthorn 1989:237~305.
3) Xu Mingyu, The medicinal study of Seabuckthron. 1991:(5), 38.
4) Xu Zhonglu, J, Nutrit, 1956:(1), 333.
5) Zhang Zheming, J, Seabuckthron, 1990:(3), 42-46.
6) Wu Futheng, J, Seab, 1991:(2), 38-41.
7) Chen Xiugong, J, Seab 1988:(4), 35-37.
8) Ge Hong, J, Jeab, 1992:5(1), 7-15.
9) Wang Bingwen, J, Seab, 1993:6(2),23-27
10) Liu Fengming, J, Chinese Pharmacogn, 1989, 5(1), 44-47.
11) Ren Lifeng, J, Seab, 1992:5(4),23-26.
12) Zhang Maosun, J,Chinese Cardiovascular System, 1987:15(2), 97-99.
13) Zhang Peizhen, J, Seab, 1989:(3)31-34.

14) Li Yong, J,Chinese Prev, Medicin, 1987:21(4)199-200.
15) Ge Xioyan, J,Chinese Tradit, Medicin, 1986:17.42-44.
16) Li Yong, J, Nutrit, 1989:1(1), 47-52.
17) Li Yufen, J, Seab:6(2), 28-29.
18) Zhang Zhemin, J, Seab, 1992:5(2), 33.
19) Wu Xiaru, J, Seab, 1992:5(2), 22-25.
20) Che Xiping, J, Seab, 1989:(4), 37.
21) Li, Mingzhong, J, Seab, 1989:(4), 37.
22) Zhang Wenlu, J, Seab, 1988:(1), 27-30.
23) Zhang Zheming, J, Seab, 1991:(4), 7.
24) Wang Neiwen, J, Seab, 1989:(4), 31-36.
25) Zhao Tiande, J, Seab, 1987:18(11), 22-24.
26) Hao Wenming, J, Seab, 1991:(2), 35-37.

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