The Flavonoids Immune Function Research of Physalis Peruviana Cauline Leaf

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Abstract: Ripe cherry fruit and seeds can be used as a medicine. Acid berries as a food and medicine has a long history, and has clear fall blood sugar, and other activities. Modern research has shown its fall blood sugar, antioxidant and radical scavenging, a variety of pharmacological activities such as anti-inflammatory immune resistance, is one of the most promising Chinese medicines in the treatment of diabetes. In this paper, the acid berries stem leaf flavonoids to study the immune function, provide reference for further exploitation and utilization of acid berries.

1. Introduction

Natural food antioxidants is very popular with the public's trust and, add those who exist in nature, in food for hundreds of years people have been eating, and for its security did not put forward objection compounds. Generally considered that should be more safe and reliable. Nearly ten years, has been to hundreds of species of natural compounds of oxidation resistance comprehensive research, but most of the research is aimed at, gasoline, rubber plastic and other non-food materials on antioxidant [1]. In recent years, gradually transferred to food antioxidant, besides has been widely used in food, tocopherol, ascorbic acid and its derivatives, and some other ingredients also has antioxidant properties, it will be on business in the near future the development and utilization, which due to the rich resources and easy to extract flavonoids and become one of the important target of the study of the people.

2. The characteristics and pharmacological effects of Physalis peruviana leaves

In China Physalis peruviana advocate in the Northeast, Hebei, and Shaanxi provinces and so on. In some provinces are visible and has implemented large-scale cultivation, its autumn ripe fruit is spherical, skin shrivel, taste sweet, slightly acidic, can make fruit, rich nutrition, Physalis peruviana plant is shown in Fig. 1.

Physalis peruviana can treat hepatitis, throat disease, lung hot cough, etc. "Song medicinal properties including four subway vernacular solution" to remember is: acid pulp Shan plug, clear lung and liver, sore throats, heat cough to Ann. Detection by modern science, Physalis peruviana contains rich acid pulp AB, acid red berries, alkaloids, margin acid, carotene, citric acid berries xanthenes, grain the sterol, obtuse leaf alcohol, ring jackfruit enol, lanolin - 8-3 b - alcohol, etc. These are the indispensable trace elements in human growth [1]. In China in the 70 s edition of the Chinese herbal medicine "remember: Physalis peruviana treat pediatric whooping cough, acute bronchitis, diabetes (insulin injection is invalid) edema, root decoction to treat bacterial dysentery effects. Modern folk prescription: Physalis peruviana root decoction for the treatment of hepatitis b with special effects. With its drink with tea can clear brain, stable blood pressure, reduce blood fat, long served no dizziness?

Fig. 1 Physalis peruviana plant

Physalis peruviana nutritional value: mature fruit eat sweet fragrance, is a nutritious fruits and vegetables. Berries are rich in vitamin C, have certain curative effect on treatment of aplastic anemia. Fruit have clear heat diuretic effect, external treatment can diminish inflammation, whole herb medicine, have clear heat poison effect, especially for tonsil inflammation effect well, calyx for anti-asthma drugs. Physalis peruviana Cauline leaf has green plants, water full, leaves hypertrophy feature, as shown in Fig. 2. It is rich in flavonoids and it is excellent choice to extract flavonoids.

Fig. 2 Cauline leaf of Physalis peruviana

3. The profile of flavonoids

Flavonids from flavones compounds, that is because this kind of material are yellow (flavus) and has carbonyl [1]. It is estimated that the carbon fixed by plant photosynthesis, about 2% into flavonoids, or closely related with other compounds. They are almost exists in all the green plants. Part with free form. Sort is various, since its discovery in 1814 first flavonoids, chrysene to about 2300 species have been isolated in 1983. Flavonoids are composed of C6 - C3 - C6 class of compounds, as shown in Fig. 3.

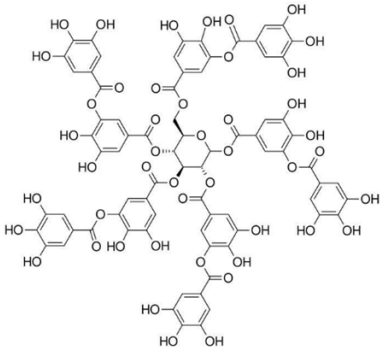

Fig. 3 Flavonoids chemical structure

4. The physical and chemical properties of flavonoids

Most flavonoids are crystalline solid, has a certain crystal shape, the minority of amorphous powder. Which is mostly yellow, color and molecules in the presence of cross of the number of conjugate system and auxochrome is related to the location and replace.

4.1 Solubility.

Flavonoids are general difficult soluble or insoluble in water, soluble in methanol, ethanol, acetic acid ethyl ester, ethyl ether and other organic solvent and dilute alkali, the flavones, flavonol, chalcone, etc., because of their molecular cross conjugate system in existence, so are some planar compounds, planar molecules piled up more closely, intermolecular force is bigger, so it is difficult to dissolve in water [2]. Flavonoids in free introduction of substituents on the parent nucleus the kind and number of different have different effects on solubility. For example, after introducing hydroxyl, water-soluble increases, lower fat soluble. Hydroxy introduction are the more water soluble. Flavonoids are a polyol, is generally not soluble in petroleum ether, it can be separated from fat-soluble impurities.

4.2 Chromogenic reaction.

Yellow ketone reduction reaction can occur, in turn, chromogenic reaction, mostly with molecules in phenolic hydroxyl and gamma - pyrone ring. But orange ketone, catechins, chalcone chromogenic reaction of hydrochloric acid magnesium powder does not occur, the vast majority of isoflavone nor the reaction [2]. Add to boric acid chromogenic reaction is 5 - hydroxy flavone or 2 - hydroxy of chalcone exclusive reaction. Flavonoids can complexing with the metal salts reagent reaction. For example, the commonly used to do quantitative analysis of flavonoids content colorimetric method is one of the aluminum salt complexation reaction, formation of the complex show yellow.

5. The biological activity and mechanism of flavonoids

Flavonoids in the 30 s of this century are found with VC activity, once as a VP. In the '60 s confirmed that activity has oxidation resistance to grease, used as a primary antioxidant. After the 80 s to the active oxygen free radical removal and prevention function of geriatrics, in biology, prevent cardiovascular disease, cancer anticancer, regulating immunity, anti-aging, antibacterial, antiviral, anti-inflammatory, anti-allergic, haemostatic pain, and many other effects, the category of function factor has been listed as a health food.

5.1 Effects of anti-cancer.

Biological flavonoids mainly through three ways to achieve the effect of anti-cancer, anti-cancer, namely the ant oxidative effect directly inhibit the growth of cancer cells, anti carcinogenic factor. Physical and chemical carcinogenic factor to produce free radicals in the body, and in the form of free radical concentration in the cell membrane lipid and cause lipid per oxidation, cell damage DNA and cause cancer [3]. Biological flavonoids is radical quenching agent and antioxidant, can effectively prevent cell damage caused by lipid per oxidation, anti-cancer, anti-cancer effect. Many biological flavonoids have glycolysis, inhibiting tumor cell growth, mitochondrial succinct oxidize activity and phosphatidyl inositol kinase in ovarian cancer cell activity and the function of anti-cancer, anti-cancer effect, especially the concentration of quercetin in mill moles can inhibit cancer cell growth and development stage of the necessary enzyme system, effectively block the proliferation of cancer cells can also inhibit calmodulin (activated factor of tumor cell DNA synthesis) and effectively inhibit tumor. Biological flavonoids can protect cells from damage by carcinogenic factor. Researchers believe that some of saliva and the intestinal bacterial glycosidase catalyze flavonoid glycoside decomposition, decomposition product flavonoid glycosides Yuan is mutation induced agent, does not often cause mutation and flavonoid glycoside.

5.2 Effects on the cardiovascular system.

Biological flavonoids because it blocks beta receptors, affect mitochondria can at the sub cellular level and can inhibit the activity of phosphodiesterase heart with chronoscopic adjust the role of myocardial contraction, improving myocardial diastolic function, against myocardial ischemia caused by pituitary, narrowing caused by ligation of coronary artery myocardial infarction, and improve the body hypoxia under normal pressure and low pressure ability, against all kinds of factors causing arrhythmia, angina, myocardial infarction, etc. Biological flavonoids have the function of the

expansion of blood vessels; can improve the contraction of vascular smooth muscle diastolic function [3]. There are two types of calcium ion channels on the smooth muscle cell membrane, is a kind of voltage dependence channel (RDC), high potassium ions to machine mainly by the cell membrane are activated. Biological flavonoids improve smooth muscle contraction and relaxation mechanism and its regulating extracellular calcium ion flow and intracellular calcium ion release. In addition, the biological flavonoids of vascular active substances of the enzyme also have certain effect. Serotonin can cause intracranial vasoconstriction, reduce blood flow, at the same time through a platelet 5 - HT promote apt into adenosine diphosphate and cause platelet aggregation.

5.3 The role of the endocrine system.

Increase in blood sugar diabetes caused by insulin disorder on the one hand, on the other hand, high blood sugar and polyols metabolic pathway abnormality hyperthyroidism diabetes complications, aldose reeducates is a key enzyme in the polyol metabolic pathway, it makes many kinds of aldehyde reduction, diabetes complications. Biological flavonoids can promote insulin [4]. The recovery of cells, reduce blood sugar and serum cholesterol, improve the glucose tolerance, against the adrenaline level of blood sugar, and at the same time it also can inhibit aldose reeducates, thus the treatment of diabetes and its complications. Many biological flavonoids with structure similar to the one female phenol sample have estrogen-like effect; it is like the steroid hormone with excitement and inhibition of double effect. Excited mechanism is that biological affinity with estrogen receptor, flavonoids estrogen-like effect intensity is consistent with the affinity intensity; Inhibition mechanism may be associated with estrogen receptor, and also one of uterus tissue peroxides (the enzyme concentration increased with the addition of estrogen and), it is directly inhibit a variety of enzyme activity.

5.4 The role to the immune system.

Biological flavonoids can enhance the body's nonspecific immune function and humeral immune function [4]. According to research, sea buckthorn flavonoids can increase the rate of T cells points, thymus index, spleen specific roses forming cells (SR - FC), that can adverse affect cyclophosphamide SRFC caused by reduction, and promote the lymphocyte transformation in low concentration (rain), the suppress at high concentration, so as to improve the immune function of organism, but the mechanism of biological flavonoids boost the body's immune function, it is not clear.

5.5 Anti-inflammatory analgesic action.

The anti-inflammatory and analgesic effects of flavonoids, in clinical and pathogenic microorganisms can be used to treat abscesses ulcer caused by inflammatory diseases, etc. At present, the development is new drugs for such products. Has found that many kinds of flavonoids have anti-inflammatory effect, the former Soviet union scholar studies have shown that amino acetyl coumarone (glycycoumarin) have strong anti-inflammatory and metamorphosis. It is better than the efficacy of sulfanilamide and antibiotics [5]. D.M. Yang and Sh. Xu were obtained from wear heart grass of 1, 6 - dihydroxy 3, 5 - dimethoxy ketone (CX) have direct anti-inflammatory effects. Studies have shown that CX on mouse ear swelling caused by xylene, the increase of blood capillary permeability of the abdominal cavity of mice caused by acetic acid, egg Qing dynasty to the rat foot swelling of the three acute inflammations has obvious inhibitory effect [5].

5.6 Resistance to radiation.

Electric radiation effects on organisms produce free radicals caused easily make the cell damage, the structure and function of the flavonoids because - with the role of free radicals and has the ability of resistance to radiation in the experiment of quercetin resistance to radiation damage effect observation of 60 Co gamma irradiation human peripheral blood lymphocyte proliferation and mouse bone marrow and spleen DNA LPO content, the results show that quercetin can improve human peripheral blood lymphocytes of radiation resistance, increase the illuminated the mice bone marrow DNA content, reduce the content of LPO spleen, prove that flavonoids has certain effect against

radiation [5].

6. Summary

The chemical activities of flavonoids have resistance to hardening of the arteries reduce cholesterol spasmolysis and radiation protection. Certain flavonoids are considered against bad blood acid and adrenaline has antioxidant activity, and is a certain enzyme inhibitors and smooth muscle relaxant. Flavonoids are one of the effective ingredients of many Chinese herbal medicines. It can treat chronic bronchitis, coronary heart disease, hepatitis, lymphoid tuberculosis disease, etc. Flavonoids from natural plants and have broad application prospects in the food. Grease and containing fat foods in storage, the grease of the unsaturated fatty acid oxidation easily generate hydrogen peroxide, and then decomposed into aldehyde, ketene, such as low-level fatty acids, make food spoilage.

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