Research progress on the extraction of is flavones from Radix Puerariae and the pharmacological effects of is flavones

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Abstract. The flavones from purring lobat have important medicinal value, have strong physiological activity, in a variety of disease prevention and treatment. In this paper, the research progress on the extraction of is flavones from purring lobat and the pharmacological effects of is flavones were reviewed, provided a reference for subsequent research work of purring.

Keywords: Radix puerariae, is flavones, extraction method and pharmacological effects.

1. Introduction

Radix puerariae contains high-quality starch, essential amino acids (lysine, methionine, phenylalanine, isoleucine, leucine, etc.) and trace elements (zinc, manganese, selenium, germanium, etc.), also contains a lot of physiological activity and pharmacological effects of is flavones, mainly include the puerarin, daidzein, daidzein, genistin, genistein, biochanin A, and so on more than 30 component [1-9], accounts for about 5-10% of the total puerarin. Is flavones possess anti-tumor, protect liver, fall fat, fall blood pressure, increase immunity, regulating endocrine function, such as for migraine, angina, hypertension, sudden deafness, women menopause syndrome and so on have special curative effect[10, 11].

At present, the extraction technology of total flavonoids of radix puerariae reports mainly include: decollation method, organic solvent extraction, ultrasonic extraction, microwave extraction, supercritical CO_2 extraction, etc.

2. Extraction methods of is flavones from *Radix Puerariae*

2.1 Diacolation method.

Diacolation method is simple but the production cycle is long, large dosage of solvent, dry extract yield is not high. Zhao Haoru etc. compared the effect on extraction yield of is flavones from *Radix Puerariae* with diacolation method and hot reflux method, the results showed that ethanol reflux method of is flavones yield higher than diacolation method.

2.2 Organic solvent extraction.

Organic solvent extraction are mainly by extracting agent such as ethanol, methanol, acetone extract is flavones, and this method can be divided by different extraction methods alcohol reflux method and impregnation method. Alcohol reflux method is one of the most commonly used method of is flavones extraction, short production cycle, low cost, high yield of dry extract but low yield of is flavones. Impregnation method commonly used in extraction of *Radix puerariae* starch and is flavones at the same time, the production cycle is long, the dosage of solvent is bigger, dry extract yield and content of is flavones between reflux method and diacolation method.

2.3 Ultrasonic extraction

Ultrasonic extraction principle is the use of ultrasonic cavitation effect to accelerate the rupture of the membranes, the active ingredients in the cell rapid dissolution, ultrasound to extract mechanical shock to speed up the mass transfer rate, thus greatly shorten the extraction time, increase the extraction rate of effective components and raw material utilization. The ultrasonic extraction method

has simple operation, the advantages of saving energy, saving time, and high extraction rate, however, there is no large scale production equipment at present.

2.4 Microwave extraction

Microwave extraction method has simple operation, high yield, high efficiency and selectivity, and the advantages of easy purification for product. Microwave extract pueraria is flavones process was reviewed, the use of microwave extraction technology, the extraction rate of total is flavones from Radix Puerariae more than 96%, compared with the traditional heat extraction, not only the yield is high, and high speed, energy-saving[12]. However, this approach only stay in the laboratory, the realization of industrial production is more difficult.

2.5 Supercritical CO_2 extraction

This method is compared with traditional solvent extraction, has advantages of good separation effect, high extraction efficiency, and less free of solvent residue, extract impurities etc., but the equipment is expensive, complex operation, high production cost [13].

In addition, the extraction methods of is flavones from Radix Puerariae includes also alkali method, water extraction process, enzymatic hydrolysis, etc.

3. Pharmacological effects of is flavones

Is flavones from *Radix Puerariae* showed strong activity in the treatment of various diseases. Studies have shown that is flavones from *Radix Puerariae* on prostate cancer [14], breast cancer, gastric cancer, liver cancer, leukemia[15] and some other can inhibit cancer cell growth and proliferation; Study of castrated rats was shown that is flavones from *Radix Puerariae* have estrogen-like effects[16]. In animal studies also found that the pueraria is flavones from *Radix Puerariae* to dilate blood vessels, reducing vascular resistance, protect myocardial, hypoglycemic fall hematic fat, inhibit blood coagulation, antithrombotic, prevention and treatment of myocardial infarction, treatment of liver damage, liver ischemia, etc. have obvious effect; In addition, the study also found that is flavones from *Radix Puerariae* have strong antioxidant, remove the body's ability to free radicals, the antioxidant capacity with vitamin E[17].

According to the recent years of chemical components, pharmacological and clinical research, confirmed that is flavones from Radix *Puerariae* are both pharmacological factors and important nutrition factors, is essential for a newly discovered the human body, can't synthesis and must be from food intake of nutrients, have important physiological health care effect to human body. Future may open up a broader in health care, health care use, may also discover new active ingredients and pharmacological effects, will make this traditional medicine edible plants play a more important role in the disease cure, has the good economic efficiency and social benefits.

4. Conclusion

(1) The extraction methods of is flavones from Radix Puerariae, has their own characteristics. Specific method should be depending on the technology, economic conditions and puerarin resources.

(2) For a long time, the resource use of Radix Puerariae attends, failed to two categories, is flavones and starch components extraction used at the same time, to a great extent, caused the waste of resources. How to carry out the comprehensive utilization of radix puerariae and improve its economic value is the problem to be solved.

(3) Is flavones from Radix Puerariae as a new type of natural factors, in the food industry, pharmaceutical industry, and daily chemical industry plays an important role. With the deepening of scientific research, will further expand its application field.

Acknowledgements

The authors wish to thank the helpful comments and suggestions from my leaders and colleagues in college of chemistry and chemical engineering, zhoukou normal university. This work are

supported by the Natural Science Foundation of He'nan Province of China (Grant No. 132300410480), the Scientific Research Innovation Foundation for college students of zhoukou normal university(Grant No. zknuD15018) and the Scientific Research Innovation Foundation for college students of college of chemistry and chemical engineering, zhoukou normal university(Grant No. HYDC201509).

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