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Study on Chemical Composition and Biological Activity of Salvia Haematodes-a

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ABSTRACT. *Salvia haematodes-A is a perennial herb halophyte belonging to the family Limonaceae or Blue Snow Lime. At present, there are about 300 species of Salvia haematodes-A resources in the world. There are 17 to 18 species in China. . In this article, the chemical constituents and living activities of the blood-colored Salvia haematodes-A spp. Are studied, and it is found that not only has hemostatic, heat-clearing and dehumidifying effects, but also has good biological activity. 11 compounds can be obtained through isolation. Acid, quercetin 3-glucoside, ethyl gallate, (+)-catechin, isorhamnetin-3-rutinoside.*

KEYWORDS: *Salvia haematodes-a, Chemical composition, Biological activity*

1. Analysis of the basic components of Salvia haematodes-A

In 1991, Xiao Zhenfa et al. [1] carried out a basic composition analysis of Sanguinaria, and the results showed that Sanguinaria contains a variety of proteins, polysaccharides, amino acids, vitamins, minerals, and a small amount of flavonoids and soap , Organic acids, alkaloids and tannins. Among them, there are more than 18 kinds of amino acids, including essential amino acids and non-essential amino acids required by the human body. Among them, glutamic acid and proline content are higher, while methionine and cysteine content are lower. Among the inorganic elements, the constant elements K, Na, Ca, and Mg had a larger content, and K and Na had the highest content. The contents of trace elements Ni, Zn, Cr and Co are higher. However, the Pb content exceeds the limit set by the FAO / WHO Food Standards Committee [2]. Bloody Salvia haematodes-A is rich in vitamin C, B1, B2, B12 and carotenoids. Vitamin C content is as high as 12mg / 100g or more.

The experimental results show that Sanguinaria is rich in vitamins C, B1, B2, B12 and carotenoids. Vitamins B2, B12, and C are hematopoietic substances of red blood cells. . It is worth noting that blood-colored Salvia haematodes-A is rich in vitamin B12, and vitamin B12 has a special effect on malignant anemia and hemorrhagic anemia has been confirmed by relevant research and clinical [3].

2. Chemical Components

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2.1 Container Material

The medicinal material was collected from the rural area of Dongtai, Jiangsu Province in August 2008. It was identified by Professor Yu Yanqiu of the School of Life Science and Technology of Yancheng Teachers College as a blood-colored Salvia haematodes-A. The instrument uses X-4 micro melting point analyzer, NICOLET FT-IR50X infrared spectrometer, VG ZAB-HS mass spectrometer, Varian INOVA 500 superconducting pulse Fourier transform nuclear magnetic resonance spectrometer. Silica gel for thin layer chromatography, silica gel for column chromatography, dextran gel and analytical grade.

2.2 Extraction and Separation

Salvia haematodes-A whole grass 20 kg, pulverized, heated and refluxed with 75% ethanol solution for volume extraction 3 times, 2.5 hours each time; filtered, combined with filtrate, concentrated under reduced pressure to recover the solvent to a non-alcoholic taste, and removed the concentrate with petroleum ether Chlorophyll. The concentrate was extracted three times with chloroform, ethyl acetate, and n-butanol in the same amount as the concentrated solution. The solvent was recovered to obtain the extracts of each part. The extracts were combined to obtain the chloroform, ethyl acetate, and n-butanol portions. And water parts. Compounds were isolated from chloroform extracts of Sanguinaria by using various chromatographic means, including silica gel column chromatography, gel column chromatography, preparative thin layer chromatography, open ODS column chromatography, and Sephadex LH-20 purification.

2.3 Chemical Composition Structure Identification

(1) Oleanolic acid: white needle crystal, mp 309 ~ 310℃, + 80° (CH3OH), easily soluble in chloroform, acetone and methanol

(2)Quercetin 3-glucoside: yellow powder, mp 227-229°C, positive reaction with hydrochloric acid-magnesium powder.

(3) ethyl gallate: white needles (chloroform-methanol), mp 157-158°C. FeCl3 is blue-black, easily soluble in acetone and methanol, and slightly soluble in chloroform and water.

(4) (+)-catechin: colorless needles (methanol), mp 254-256 ° C. TLC was developed, purple-black color appeared under ultraviolet light (254 nm), and FeCl3 color showed dark blue color, suggesting that there are phenolic hydroxyl groups in the structure; hydrochloric acid-magnesium powder reaction was negative.

(5) Isorhamnetin-3-rutinoside: yellow powder (methanol), mp 167-169 °C, yellowish under TLC UV lamp (254 nm), sulfuric acid-ethanol is pale yellowish, and it shows flavonoids.

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In 1994, Guo Hongzhu [4] et al. Analyzed the chemical composition of the upper part of the blood-colored and nourishing grass using reflux extraction, and obtained 4 compounds. According to the determination of physical and chemical constants, spectral analysis and comparison with related maps, they were identified as Myrica barktin-3-O-β-D-glucoside (I),Myrica barktin-3-O-α-L-rhamnoside (II), Quercetin-3-O-α-L -Rhamnoside (III) and quercetin (IV). These four compounds were isolated from this plant for the first time, and the results of this study are consistent with previous studies. According to the literature, myrica barklin-3-O-α-L-rhamnoside has the effects of raising blood pressure, exciting the heart, and anti-inflammatory and choleretic [5], quercetin-3-O-α-L- Rhamnoside has antiviral, anti-inflammatory and diuretic effects. Quercetin also has a function of lowering blood pressure, increasing coronary flow, resisting free radical antioxidant effects, and also has anti-cancer effects [6]. The above ingredients may be effective ingredients for removing blood from the blood, tonicating wind, clearing heat, and dispersing scars. Because its active ingredients are biologically active, it is presumed to have good biological activity.

3. Blood Salvia haematodes-A Bioactivity

Lin LC found that 10 flavonoids isolated from the ethanol extract of Sanguinaria L. root can inhibit HSV-1 virus replication in Veto (green monkey kidney cells), among which compound 1 ((-)-epigallocatechin 3- 0.gallate, IC_{50} = 11.4μM), and compound 2 (samarangenin B, IC_{50} = 38.6μM) have the strongest inhibitory ability, and have higher than the positive anti-herpes virus agent acyclovir (Acydovir, IC_{50} = 55.4μM) Inhibitory activity. Kuo YC clarified the molecular mechanism of samarangenin B's inhibition of HSV.1 replication through further research.By inhibiting the expression of HSV-1a gene, ICP0 (infected.cell protein 0) and ICP4 (infected.cell protein 4) genes, it prevented β transcription Thereby, the synthesis of HSV-1 DNA and the expression of Veto structural proteins are suppressed to prevent the HSV-1 virus from replicating.

Chanung SS study found that water extract of Salvia haematodes-A cordoba and root methanol extracts had protective effects on liver injury induced by CCl4 and D.GaIN in mice, and aspartate aminotransferase (SGOT) in serum was tested in mice treated with the two extracts. And alanine aminotransferase (SGPT) levels were significantly reduced, and triglyceride levels were significantly increased. In vitro studies have further found that the fractions of the methanol extracts of leaves after chloroform extraction have potential cytotoxicity to human liver cancer cells (Hep3B). Tang Xinhui and other researchers studied the protective effect and pharmacological mechanism of aqueous extract of Sanguis lanceolata root on acute liver injury in mice, and found that the extract can effectively inhibit mouse aspartate transferase (AST) and alanine transferase (AST) induced by CCl4 (The increase of ALT) activity, the reduction of mitochondrial morphological structure caused by liver injury in mice, the inhibition of mitochondrial membrane potential reduction and the decrease of mitochondrial sensitivity to high calcium-induced swelling, its pharmacological mechanism may be related to its protective effect on

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mitochondria .

At present, the research on the chemical constituents of Salvia haematodes-A hemorrhagicum is mainly focused on flavonoids, and its activities are mainly antiviral, anticancer, and protective effects on liver injury in mice. The antioxidant and other aspects need to be studied more systematically. Previous research results show that the mass fraction of total phenol in the acetone extract of Salvia haematodes-A cordrum is very high, reaching 55.55%. It has strong reducing ability and strong ability to scavenge DPPH free radicals and ABTS free radicals. Experiments have shown that the strong radical scavenging ability of Sanguinaria lanceolata root extract has a positive correlation with its high polyphenol mass fraction, which is positively related to Sanchez-moreno et al. And Mohamed et al. On the “mass fraction of phenolic substances and their biological activity and scavenging radical capacity “The results match. These results indicate that Salvia haematodes-A cordata is expected to be exploited as a new natural antioxidant resource.Some studies have also shown that the alcohol extract of Salvia haematodes-A chrysanthemum has a significant effect on suppressing ear swelling in mice, and also has a significant effect on inhibiting the growth of mouse granulation tissue. Studies by Yichuan Wu and others from Yichuan showed that crude extracts of anthocyanin from Salvia haematodes-A aureus had antibacterial effects on E. coli, Staphylococcus aureus, and Bacillus subtilis, and the effects increased with increasing concentration. To study the effect of water extract and alcohol extract of Salvia haematodes-A bicolor on the time of coagulation and coagulation in mice. The results show that the extract can significantly shorten the coagulation time in mice, and the hemostatic mechanism may be related to affecting the activity of coagulation factors and the adhesion and aggregation of platelets. Studies have investigated the mechanism of hemostatic effect of Salvia haematodes-A bicolor on ethanol in rabbits, which may be related to its role in promoting platelet aggregation and vasoconstriction. Of course, further research is needed on the biological activity and the separation and identification of its components.

4. Conclusion

Salvia haematodes-A blood color has a wide range of sources, high protein content, complete amino acid types, multiple inorganic element types, high trace element content, and rich vitamins.It also contains flavonoids, tannins, polysaccharides and other physiological and pharmacological activities. substance. In addition to its blood-supplementing, hemostatic, antibacterial, anti-inflammatory, liver-protective, anti-cancer, and antiviral functions, this plant also has biological activities.It is generally believed that its biological activity is related to its rich polyphenols and flavonoids, but specific biological activities No ingredients have been reported yet, and further research is needed. In recent years, researchers have continued to make in-depth research on the blood and blood replenishing herbs, and have further clarified their effective ingredients and pharmacological effects, laying a solid foundation for reasonable development and utilization in the future.

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