The Latest Modern Research and Application of Hedyotisdiffusa

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Abstract. Hedyotisdiffusa contains anthraquinones, flavonoids, alkaloids, organic acids, polysaccharides and other active ingredients. Hedyotisdiffusa has the efficacy of clearing away heat and toxic materials, removing dampness and relieving stranguria, antibacterial and anticancer. It has been widely used in anti-tumor, anti-oxidation, antibacterial, anti-inflammatory and enhancement of immuno-regulation. But the research and application of Hedyotisdiffusa takes single medicine and many composition as the main, has a small number of Chinese Formula, external use and food therapy, so there is a great prospect for the application of Hedyotisdiffusa in prescription and diet. This paper focuses on the pharmacological effects, clinical application and therapeutic aspects of Hedyotisdiffusa, in order to provide a better basis for the comprehensive utilization of Hedyotisdiffusa.

Introduction

Hedyotisdiffusa is the whole grass with root of the rubiaceae, which is first recorded in the flora of Guangxi. Hedyotisdiffusa taste bitter slightly and sweet, channel tropism stomach, large intestine and small intestine. The whole plant can be used for medicine, with the effects of clearing away heat and toxic material, eliminating carbuncle and relieving pain, removing dampness and relieving stranguria, antibacterial and anticancer. Hedyotisdiffusa can be used for carbuncle swollen boils, snakebite in external treatment; For oral, can be used for malignant tumor, urinary tract infection, hepatitis, bronchitis and other diseases. Hedyotisdiffusa has a good cure effect for gastric cancer, gastritis, colitis and other digestive diseases. Therefore, there is a custom that use it for food therapy in folk. Hedyotisdiffusa contains anthraquinones, flavonoids, polysaccharides and other ingredients, has a good application prospect on antibacterial anti-inflammatory, anti-tumor, antioxidant and so on. In this paper, through the collation of the literature in recent years, making a review on these aspects of chemical constituents, pharmacological effects, clinical application and therapeutic application. in order to make better use of hedyotisdiffusa in medicine and in the service of the people.

The Chemical Composition of Hedyotisdiffusa

The chemical constituents contained in hedyotisdiffusa are complexly, mainly containing the following categories of compounds. Anthraquinone: 2-methyl-3-hydroxyl anthraquinone,
2-hydroxy-1-methoxy anthraquinone, 2, 6-two hydroxy-3-methyl -4-methoxy anthraquinone; Terpenoids: scadonolide, asperuloside, 10-acetyl paederoside; Flavonoids: samentoflavone, meletin, kaempferol; Sterols: β-sterol, β-D-glucoside-β-glutamyl, cupreol; Organic acids: coumaric acid, mistletoe acid, 3, 4-two hydroxyl dihydroxybenzoic acid; Polysaccharide: galactose, arabia sugar, glucose. In addition, it also contains alkanes, alkaloids, glycosides, trace elements, amino acids and volatile compounds [1].

The Pharmacological Effects of Hedyotisdiffusa

Anti-tumor and increase the activity of phagocytic. With the growing side effects of Western medicine in the process of treatment of tumors, leads to poor compliance and difficult coordination. More and more research tends to be used in the development of Chinese herbal medicine, as a common traditional Chinese medicine, hedyotisdiffusa has strong medicinal value and has been proved to be effective in anti-tumor. According to the literature, the ethanol extract of hedyotisdiffusa can inhibit the differentiation of colon CSC (tumor stem cells) by inhibiting the activity of Wnt signaling pathway, and its effects show concentration dependence [2]. The activity of BGC-823 telomerase in gastric cancer cells was inhibited by the flavonoids of the hedyotisdiffusa, showing the obvious anti-tumor effect [3]. The hedyotisdiffusa may inhibit bladder cancer T24 cells and induce it apoptosis via the JAK2 / STAT3 pathway [4].

The immunoregulation of hedyotisdiffusa. The hedyotisdiffusa as common medicine in folk, many studies have proved that it has the effect of enhancing immune regulation. According to reports in the literature, the monosaccharide composition of the hedyotisdiffusa can significantly enhance the clearance index, thymus index, phagocytic index and splenic index of immune compromised mice induced by cyclophosphamide, and strengthening its immunity [5]. The expression of Bcl-2 of Ramos cell of human B lymphocytoma was significantly inhibited by the injection of hedyotisdiffusa, which inhibited it proliferation and apoptosis ultimately [6].

The antioxidation of hedyotisdiffusa. Flavonoids are the main chemical components of hedyotisdiffusa, while flavonoids and polyphenols are the main material bases for the antioxidant activity of extracts from medicinal plants. The polysaccharide composition of the hedyotisdiffusa, its highest antioxidant effect is close to the level of antioxidant BHT, which is commonly used in food processing and industrial production [7]. The alcohol extract from hedyotisdiffusa could obviously reduce the mice lipid peroxidation products MDA, enhancing the activity of superoxide dismutase, catalase, hydroxygenase and the total antioxidant capacity contained in serum, liver and brain tissue [8].

The antibacterial and anti-inflammatory of hedyotisdiffusa. The study found that the hedyotisdiffusa has the function of clearing away heat and toxic materials, which is related to the decrease of inflammation index and immune index [9]. The 95% ethanol extract of the hedyotisdiffusa has the effect of antibacterial, and the antimicrobial activity of gram-negative bacteria was more obvious than gram-positive bacteria. The total flavonoids of hedyotisdiffusa could inhibit the NF-κB p65 activation, reduce the expression of proinflammatory factor IL–8 and TNF-α, increase the expression of anti-inflammatory factor IL-10. Thus, there is a significant effect of anti-ulcerative colitis (UC) [10].
The Clinical Application of Hedyotisdiffusa

The application of hedyotisdiffusa in prescription. With the innovation and development of traditional Chinese medicine, traditional Chinese medicine is no longer limited to the diseases recorded in ancient books, but also applied to the modern frequent diseases. The same is true of the hedyotisdiffusa. One of the most important risk factors for atherosclerosis is high cholesterol and elevated blood lipid levels. The "turbidity inside junction" is the pathogenesis of atherosclerosis, so the targeted therapy of "clear heat and toxic turbidity" is put forward. The hedyotisdiffusa and Paris polyphylla all tastes bitter belong to the liver meridian. After the combination of the two, the functions of clearing away heat and toxic materials increased. The clinical efficacy of atherosclerosis was significant. Primary hepatocellular carcinoma (PLC) is a common malignant digestive tract tumor, which has no identifiable symptoms early in its onset, and can delay the disease and lose the best treatment period. After the patients took the detoxification and invigorating the spleen that the hedyotisdiffusa as the main medicine, the pain was relieved, the proliferation of tumor cells was suppressed, and the drug dependence was reduced. The soup of soothing liver and nourishing blood (made by hedyotisdiffusa, Sargent gloryvine, Angelica sinensis and others) used for chronic pelvic inflammatory disease is better than western medicine. Acne, in Chinese medicine belongs to "lung wind acne" category, not only attacks people’s health, but also causes a lot of economic loss and waste. The treatment of acne has a long history, acne fang (hedyotisdiffusa, dandelion, wild chrysanthemum, etc.) is a kind of hospital agreement party. Clinical studies show that the symptoms of acne can be improved as a whole and the effectiveness of acne can be significantly improved according to the patient’s etiology and syndrome differentiation. In addition, the prescription made by hedyotisdiffusa and scutellaria barbata or others can be used for the treatment of various types of tumors.

The application of hedyotisdiffusa in Chinese patent drug. With the increasing temperature of traditional Chinese medicine in the world, the research and utilization of various Chinese medicinal materials are not limited to the application of existing diseases and dosage forms. In traditional Chinese medicine innovation development and promotion, Chinese herbal medicine new formulation, dosage form and medical scope are also expanding. The main pathologic features of chronic renal failure are renal fibrosis. Traditional Chinese medicine believes that wet heat plays an important role in the development of the disease. Qingshen granule (Hedyotisdiffusa, Wormwood, Alisma, etc.) can decrease the chronic renal failure patients’ serum MDA and ROS level, increase SOD level to improve the patient’s clinical symptoms, inhibit the oxidative stress responses in hot and humid syndrome patients, enhance the antioxidant capacity, and delay the progress of renal fibrosis. Cancer seriously affects people’s quality of life and physical and mental health, and a thorough cure way of cancer is a problem that the world needs to solve. After treatment with the injection of the drug, the incidence of the infection decreased while the curative effect was increased. Inflammation ning syrup (Hedyotisdiffusa, Pilose antler, Commeline communis) can be used for the treatment of upper respiratory tract infection, tonsillitis, urinary tract infection, acute bacillus diarrhea, and enteritis.

The application of hedyotisdiffusa in external treatment. The hedyotisdiffusa not only can be internal, but also can be applied into external. On the basis of the use of the soup, the powder of the hedyotisdiffusa was applied to the liver of liver cancer patients, the efficacy was satisfactory and no recurrence was found within two years. The external form of hedyotisdiffusa has the effects of clearing away heat and toxic materials, reducing swelling.
and resolving mass and relieving stasis and relieving pain, after rinsing the hedyotisdiffusa and pounding to pieces, applied to the patients with double - deficit breast cancer, satisfactory results can be obtained. The vulva white lesions are one of the diseases of the gynecological diseases, and have a high clinical morbidity. Traditional Chinese medicine believes that the disease is caused by spleen deficiency, wet and hot wager or injury liver and kidney Yin blood, pubic skin lost in nourishment. White spot I paste is composed of hedyotisdiffusa, pearl, rhizoma bletilliae. It has the effect of nourishing the blood, removing stasis and relieving itching and refreshing the heat. Clinical studies showed that making it applied to 112 cases with vulva white lesions, and the clinical efficacy was significant, and the total effective rate was 98.2%.

The Therapeutic Application of Hedyotisdiffusa

The frog soup of hedyotisdiffusa. Hedyotisdiffusa, horseshoe, radix scrophulariae, frog and fresh ginger. Wash the first two ingredients and soak them; Wash the horseshoe and remove the peel, Make the frog go to the bowel and cut a piece. Put all the ingredients in clay pot with ginger; add water 2L, cooking and adding proper salt. It has the functions of clearing away heat and toxic materials, nourishing yin and relieving summer-heat.

The soup of hedyotisdiffusa and tremella fuciformis. Tremella fuciformis 25g, burnet 20g, hedyotisdiffusa 30g, donkey hide gelatin 12g. The tremella is softened with warm water, washed and boiled with water; Melt the glue in advance; Add burnet, white snake hedyotisdiffusa decoction to extract juice; Combine the three ingredients and combine them with the tremella fuciformis. It has the efficacy of clearing lung and beneficial qi, and it has curative effect on lung cancer patients.

The hedyotisdiffusa stewed duck. Hedyotisdiffusa 50~100g, one duck. Wash the ducks in a clean cut; Make the hedyotisdiffusa in gauze bag. Simmer the two ingredients with water and season with salt. It has the effect of nourishing the stomach, clearing away heat and toxic materials and inducing diuresis to alleviate edema, and can be used for adjuvant therapy for patients with lung cancer.

The tea of hedyotisdiffusa and liquorice. Hedyotisdiffusa 250g, liquorice 10g, green tea 3g. Add water to the first two ingredients and beat the surface of the medicine. Cook until 400ml. Soak the tea leaves in the juice for 5min. It has the function of moisture, detoxification and clear heat, can be used for hepatitis, liver cirrhosis and liver cancer.

Summary

The hedyotisdiffusa is widely distributed; rich in fujian, guangdong, Hong Kong, yunnan and other provinces, according to planting time can be reaped two times a year. In recent years, the development and utilization of traditional Chinese medicine has increased. On the basis of the original research, the new compound and the therapeutic diseases range of hedyotisdiffusa gradually increased. The alcohol extract, chloroform part compounds, water decoction extraction and injection compound of hedyotisdiffusa is increasingly sophisticated, new compounds and pharmacological activities have been applied to the study. The application of prescriptions made mainly by hedyotisdiffusa in modern high-incidence diseases has achieved better results. Such as Gastrointestinal disease, cardiovascular and cerebrovascular diseases, rheumatoid arthritis, psoriasis, acne, kidney failure and other diseases. The application of hedyotisdiffusa from the application of decoction to the present
stage, such as prescription, tablet, granule, injection, and extract agent. The health culture of traditional Chinese medicine still affects people’s daily life. The improvement of economic living standard led to the improvement of people’s health awareness, the use of white flower snake tongue grass in porridge, soup and tea gradually increased and expanded the therapeutic application level.

The hedyotisdiffusa’s resources are abundant, cheap and easy get, the effect is accurate and the side effect is extremely low. However, in recent years, it can be seen that the hedyotisdiffusa is mainly treated with individual medicine and post-disease treatment, and its combination of drugs and preventive medicine is less; The research on its active components and the mechanism of action based on the exact components have rarely been reported; The material basis and mechanism of pharmacological activity are not clear. All of these making the research on the preparation of the hedyotisdiffusa is backward. Most of the study about the single component of the hedyotisdiffusa is still limited to the stage of animal research and cell research, and has not yet entered the stage of clinical research. Many formulas is still use whole grass decoction, effective chemical composition low and may be damaged or producing harmful compounds, affecting its medicinal and food therapy value. And whole grass is not easy to preserve, easy absorb moisture in the air and become moldy. Therefore, it is necessary to carry out systematic and innovative research for the comprehensive utilization of the resources of hedyotisdiffusa.

As the incidence of various diseases rises sharply, people are more and more inclined to live in traditional Chinese medicine. To make use of the hedyotisdiffusa, we should make the following efforts: Clear the basis of the pharmacodynamic material of the hedyotisdiffusa in the application of various diseases, increase the research on this aspect; On the basis of the pharmacodynamic substance of the hedyotisdiffusa, the single component should be extracted and processed into the corresponding dosage form; Medical researchers should make clear the mechanism of the therapeutic effect of the hedyotisdiffusa or active ingredients, avoiding combination of drugs is the same mechanism as other drugs, resulting in a substantial injury to the patient; In health, the use of porridge, soup and tea is more time-consuming, so it should be processed into calcium tablets, capsules, instant porridge, bagged tea, etc., which are convenient to carry and eat. Based on the above analysis, in order to making it play an increasingly important role in TCM medical and health care, it is still necessary to further study and exploit the herb of hedyotisdiffusa.

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References


