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The preliminary exploration of the application of cyperi rhizoma

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ABSTRACT

Cyperus rotundus L. has been widely distributed in China. In the exploration of Cyperi Rhizoma to pay attention on its geoherbalism is very necessary. The current index of quality control for Cyperi Rhizoma and Cyperus rotundus-volatile oil is the α -Cyperone contained in the Cyperus rotundus-volatile oil, different processing methods influence the content of their α -Cyperone. On the basis of the traditional formulations, to develop the production of dropping pill of volatile oil from Cyperus Rotundus has broad application prospects.

KEYWORDS

Cyperi Rhizoma; α -Cyperone; Dropping pill of volatile oil from cyperus rotundus.



INTRODUCTION

Cyperus Rhizoma is the root of *Cyperus rotundus* L. and it is also known as purple nutsedge alias, Lufthansa grass, Spartina grass, which has about 1800 years application history to cure illnesses such as liver qi stagnation. Li Shizhen called it "director of gas disease, the general of the female subjects" in the "Compendium of Materia Medica", which shows its important value in medical application.

DISTRIBUTION OF THE CYPERUS ROTUNDUS L. IN CHINA

Most of *Cyperus rotundus* L. is wild, dependent on natural resources, mainly in Zhejiang, Shandong, Henan, Anhui, Hubei, Hunan, Jiangxi, Guangdong, Fujian and other provinces. Following cities and counties are the main origin: Tai'an, Changyi, Anqiu, Liangshan, Junan, Xintai, Laiwu in Shandong Province; Jinhua, Zhuji, Pujiang, Yiwu, Lanxi, Dongyang, Jinyun, Wuyi, Yongkang, Yongyu, Chun Quzhou, Tonglu, Jiande, Taizhou, Yueqing, Xinchang, Ruian, Longquan in Zhejiang Province; Anqing, Lu'an, Zongyang, Huaining, east, Huangshan, Shucheng, Tongcheng, feixi, JinZhai, Ningguo, Xi County in Anhui Province; Xinyang, Huaiyang, Zhongmou, Yucheng, Kaifeng, Xinxiang, Anyang, inside yellow, Qing Feng, Nanyang in Henan Province; Xiangtan, Hengyang, Lingling, Yiyang, Chenzhou in Hunan Province; British Hill, Macheng, Xishui, Xinzhou, Laohekou in Hubei Province; Ge Yang, Shangrao, Yu Jiang, Kanayama, Linchuan, Yongxiu in Jiangxi Province; Tongan, Putian, Ping Tan, Jinjiang, Zhangzhou in Fujian Province; Zhanjiang, Sanshui, Shantou, Zhaoqing, Chaoshan in Guangdong Province.^[1] Sichuan, Yunnan, Guangxi, Jiangxi, Guizhou, Taiwan, Hebei, Shanxi, Shaanxi, Gansu, Liaoning also have some distributions of *Cyperus rotundus* L.

With the changes in the ecological environment, producing places constantly change and the production of the medicine also has a declining trend. Take "Wen Xiang Fu" for example, its main producing areas such as Wen River and Jiaolai River in Shandong no longer have harvest, there is only a small amount of the distribution in Zhucheng^[2]. *Cyperus rotundus* L. often grows in the wild ridge, roadsides, ditches, shore of lake and river and other wet ground. It grows well in the places with the mild climate, the soil moist, loose soil in sandy loam.

The quality of Cyperi Rhizoma from different areas is quite different. Take the Cyperi Rhizoma produced in Jinhua Lanxi in Zhejiang Province, the grain is big, the color is purplish red, the surface is smooth, the fragrance is thick, the quality is good.

THE ACTIVE CONSTITUENTS OF CYPERI RHIZOMA AND ITS MAIN QUALITY CONTROL METHODS

The research for Chemical constituents of Cyperi Rhizoma showed *Cyperus* rhizome contains 8.3% -9.1% glucose, 1.0% -1.7% fructose, 40% -41.1% starch and 1.4%-0.65% volatile oil. Until now more than 140 kinds of ingredients have been separated from *Cyperus rotundus*-volatile oil, including monoterpenes, sesquiterpenes and their oxides. The current index of quality control for Cyperi Rhizoma and its volatile oil is mainly the α -Cyperone contained in the volatile oil of Cyperi Rhizoma, mainly by gas chromatography and high performance liquid chromatography, some others by TLC - UV spectrophotometry and GC-MS.

THE EFFECT ON THE PHARMACODYNAMICS OF CYPERI RHIZOMA MADE BY TRADITIONAL APPLICATION METHODS

There are many different applications of Cyperi Rhizoma in traditional Chinese medicine, the efficacy varies by different applications. For example, the quality of Cyperi Rhizoma made by different processing methods has a clear difference. By thin-layer chromatography, UV spectrophotometry comparison, refer to JianchangBang forth Method, immerse 60 g raw Cyperi Rhizoma in swill for 1 day before washing and drying it. Take 3 g of ginger juice (50 g ginger juice per kg Cyperi Rhizoma) to take liquid, take 1 g salt (add water to dilute). Mix the two kinds of liquid before add Cyperi Rhizoma in it, turn it frequently in a day, then put the mixture in the pan, fry it until the color became brown, then add 12ml wine and 12ml vinegar in it. Finally leave the mixture in a jar for 2-3 d, its α -Cyperone ingredients are better than that produced by Vinegar steaming process or Vinegar drying process and every step in process can affect the components of α -Cyperus.^[3]

Lu Xiang found that the 60% vinegar (mass fraction), 1 h in jar, 150 \square when added Pieces, 10 minutes to fry, the effect to produce Cyperus is very good. It provide a positive reference for the standardization and industrialization of Cyperi Rhizoma.^[4] The Decoction methods and processing methods can directly affect the clinical efficacy. Items such as how to reduce the damage of the active ingredients of Cyperi Rhizoma, how to limit the side-effect when using Cyperi Rhizoma, how to improve the large-scale production of Cyperi Rhizoma still needs further study.

THE DEVELOPMENT OF NEW FORMULATION OF DROPPING PILL OF VOLATILE OIL FROM CYPERUS ROTUNDUS

There are records of Cyperi Rhizoma in every published version of "People's Republic of China Pharmacopoeia". In the 2010 version of "Chinese Pharmacopoeia" 50 kinds of preparations containing Cyperi Rhizoma are included, where 19 kinds are dedicated to the treatment of gynecological diseases.

However, since now all the formulations containing Cyperi Rhizoma used on clinical application are traditional Chinese medicine, including single flavor pieces and compound preparations, The Chinese patent medicine mainly includes pills, granules, capsules. Generally speaking, the above traditional formulations has the weakness of rough preparations, large dosage and slow efficacy.

Under the conditions of mature preparation technology, in order to meet clinical needs, it is necessary to have secondary development of Cyperi Rhizoma. To make it a modern Chinese medicine, to refine it to have better efficacy. Tian Youqing and other researchers have made research in the preparation process of dropping pills of volatile oil from *Cyperus Rotundus*, by referring to Shi Xiufeng and other people's methods^[5] He crushed the dried Cyperi Rhizoma into 60 mesh powder. The extraction pressure is 15000KPa and the extraction temperature is 50 °C. The separation pressure is 10000KPa and the separation temperature is 30 °C. The process cost 1.5h and volatile oil from *Cyperus Rotundus* of thick fragrance was got for the production of pills. He used variation coefficient of pill weight, rounding rate and dissolution time as evaluation index and used orthogonal design to study the main influencing factors. It was found that pills which used polyethylene glycol 4000 as a substrate, dimethyl silicone oil as condensing agent, 2.0-2.4mm dripper caliber (inside - outside diameter), 90 °C liquid, 30 drops / min drip rate, 3cm drip distance, 50 °C nozzle (condensing agent upper) temperature, had small weight difference and good overall quality.^[6]

In the follow-up research of dropping pill of volatile oil from *Cyperus Rotundus*. Ding Ping used Carrageenan to induce mouse footpad edema, xylene to induce mouse ear edema and acetic acid to increase mouse vascular permeability to study the anti-inflammatory effect of dropping pill of volatile oil from *Cyperus Rotundus*, He also used mouse models of pain induced by acetic acid and thermal stimulus to evaluate the analgesic of the pills. Later Ding Ping compared the above effect of the pills with that of aspirin and that of Sizhi Xiangfu pills; At the same time she administered mice orally with the pills and used high performance liquid chromatography to explore its material basis by assaying the transitional ingredients in rat blood.

Mice which were orally administered for 5 days at the doses of 100,200 mg/kg receive a good result in inhibiting carrageenan-induced footpad edema and xylene—induced ear edema. In addition, acetic acid-induced writhing response at low, moderate and high doses was also suppressed remarkably by the pills and pain threshold in hot plate assay at moderate and high doses was prolonged markedly. Overall cypemne was detected in medicinal serum to be the main transitional ingredient in the pills.^[7]

CONCLUSIONS

In the development of traditional Chinese medicine Cyperi Rhizoma and its modernizing process, it is significant to make sure to protect its active ingredient— α -Cyperone and to limit the side-effect of some ingredients contained in the medicine. The development and process optimization of dropping pill of volatile oils from Cyperi Rhizoma will not harm the active ingredients of Cyperi Rhizoma. The pill does not own some weakness of traditional Chinese medicine such as rough preparation, large dosage and slow efficacy. The pill will have a good prospect and broad the development of space for its advantages such as convenient administration, easy to carry and store and etc.

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