MASTER'S THESIS

鉤藤的組織化學研究

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摘要

鉤藤在中國使用的歷史已久，首先記載於《名醫別錄》，列爲下品，主治小兒寒熱，十二驚癇。鉤藤性涼，入肝、心包二經，有清熱平肝、息風止痙的作用。現代藥理研究顯明，鉤藤所含的多種生物鹼具降壓、抗癲癇、抗焦慮作用外，最新的研究亦顯示鉤藤所含的異鉤藤鹼、柯諾辛及柯諾辛 B (Corynoxine and Corynoxine B) 可清除帕金遜症致病性α-synuclein 蛋白的積聚，並有希望研發成爲治療柏金遜症的小分子中藥新藥。因此在可見的將來，鉤藤的需求日漸增加，除了規範地栽培種植外，綜合利用鉤藤的其他部位，如葉等，可最大限度地利用植物資源。

同時從本草記載來看，鉤藤曾經以皮入藥，後改用鉤入藥，傳統認爲鉤藤以莖細帶嫩鉤者品質爲佳。現代中藥著作中，鉤藤多以莖細、帶雙鉤、鉤結實、光滑、紫紅色、質嫩、無枯枝者爲佳。這依據性狀特徵的傳統經驗質量評價缺乏現代科學的客觀數據支持，有待研究。

爲此，本研究展開鉤藤的組織化學研究，研究內容包含三個部份，包括鉤藤枝條不同細胞組織的化學成分研究、鉤藤不同部位的化學成分研究以及老藤枝外皮、中層及內部組織的化學成分的研究。

研究結果顯示，鉤藤鹼及異鉤藤鹼主要存在於枝條的皮層，其他生物鹼也存在着這規律，與歷史上曾用鉤藤的皮入藥相吻合。鉤藤細胞組織分析可見木質部及髓部所含的化學成分較少，以橫切面可見，鉤的髓部面積佔整個部位在比例上比老枝及嫩枝都少，故研究結果鉤部位的鉤藤鹼及異鉤藤鹼含量，比老枝及嫩枝爲高，故評價鉤藤準則以莖細帶嫩鉤者品質爲佳這講法是正確的。

本研究爲鉤藤藥用資源的充分利用以及“辨狀論質”提供了科學的依據。

關鍵詞：鉤藤、鉤藤鹼、異鉤藤鹼、鐳射顯微切割、UPLC-QTOF-MS

Abstract

Preparations from *Uncaria Rhynchophylla* (*Gouteng* in Chinese), was historically using in Chinese traditional medicine for the treatment of pediatric cold and heat, twelve epilepsy. *Uncaria* was first documented in the "Mingyibeilu", as a low-grade drug. It is tendency cold, orientate to the two medians of hepatic and pericardium, with heat cooling, wind moderating and antispasmodic effect. Modern pharmacological studies revealed that, various kinds of alkaloid in *Uncaria* showed anti-hypertension, antiepileptic and anxiolytic effects. Besides these, recent studies demonstrated that Isorhynchophylline, Corynoxine and Corynoxine B in *Uncaria* could clear up the accumulation of pathogenic α-synuclein protein, of which is the precursor for Parkinson's disease. There is a promising future that these constituents in *Uncaria* may be developed as small molecule drugs for treatment of Parkinson's disease. Owing to these factors, demands on *Uncaria* will increase in the foreseeable future. In addition to standardized cultivation of *Uncaria*, utilization of other parts of *Uncaria*, such as leaves, could optimize plant resources of *Uncaria*.

From the perspective of Materia Medica records, the barks of *Uncaria* was once used for medicine, and later switched to hooks. According to traditional views, *Uncaria* hooks tender with fine stems are of good quality while in modern medicine works, good quality of *Uncaria* defined as stem mostly fine, hook double, firm and smooth in nature, color purple, tender and litter free. Comments on quality of *Uncaria* solely through morphological aspects and human experience is insufficient because they lack objective and scientific data to fulfill the modern quality assessments, therefore, further studies on this issue are required.

In this study, research launched on *Uncaria*, the research mainly concentrated on the histochemistry of *Uncaria* and it was divided into three domains, firstly the chemical composition of different cells and tissues of old branches and twigs; secondly

the chemical composition of different parts of *Uncaria* plant and thirdly of three sectors of old branches, which are the outermost, middle and core sectors.

Results from research showed that Rhynchophylline and Isorhynchophylline are mainly distributed in the cortex of old branches and twigs, while other alkaloids showed the same pattern. The founding supported the practice of using bark of *Uncaria* as medicine in history. Analysis on cells and tissues of *Uncaria* showed that there are less chemical constituents in xylem and pith than that in cortex layer. It was also observed through cross-sectional view, the ratio of pith area to whole of cross-section area in hook is smaller than that of old branch and twig. The pith area ratio explained why Rhynchophylline and Isorhynchophylline content in hooks are higher than that of old branches and twigs, so the guideline for evaluation of *Uncaria* that "stem with fine quality tender hooks" is correct.

This study on *Uncaria* provides a scientific basis for "quality braided theory" and evidence on optimal usage of plant resources.

Keywords: *Uncaria Rhynchophylla* (*Gouteng*), Rhynchophylline, Isorhynchophylline, Laser microdissection, UPLC-QTOF-MS

目錄

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