

## MASTER'S THESIS

### 具異型構造的藥材的比較研究

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具異型構造的藥材的比較研究  
( Comparative study on the anomalous structures  
of Chinese Materia Medica )

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## 摘 要

目的：(1)植物異常結構的類型的總結歸納；(2)植物異常結構的形成和發生原因的總結歸納；(3)對具有異常構造的常用藥材的進行比較；(4)對具有同心環狀異常構造的常用藥材的進行比較。

方法：(1)對相關異常結構的文獻資料進行比較研究和總結歸納；(2)利用肉眼和光學顯微鏡對具有異常結構的常用藥材進行比較研究。

結果：從文獻研究上來看，異常構造不但在初生組織中存在，還發生在次生組織中，形成異常初生結構和異常次生結構。異常初生結構又分為皮層維管束、內生韌皮部、髓維管束及雙子葉植物莖的散生中柱。這類結構多發生在雙子葉植物某些種類的莖中。異常次生結構包括蕨類植物的異常次生結構、裸子植物的異常次生結構、雙子葉植物的異常次生結構和單子葉植物的異常次生結構。平時我們所指的異常構造，通常是指異常次生結構中雙子葉植物的三生構造。雙子葉植物的異常次生結構包括多環維管束、附加中柱、木間韌皮部、次生木質部或髓中發生的次生結構以及木間木栓等。其結構變異的方式雖不盡相同，但它們共同的特徵是發育產生出大量的薄壁組織細胞，再從中分化出額外的維管組織，但發生部位亦可能不同。從實驗觀察來看，具異常構造的常用藥材多為根及根莖類藥材，異常結構多樣，有同心環狀異型構造，也有異心環狀異型構造等，它們發生部位不同、維管束類型和數量亦有不同，多為外韌型。具異型結構的藥材，實驗結果如文獻所述，其發育多與薄壁組織細胞有關；經過比較具同心環類根及根莖藥材的橫切面，它們都具同心環樣的花紋，俗稱同心環或羅盤紋。同心環狀排列的藥材，其異常維管組織在不同種類的植物中，其結構的存在與否和結構排列的方式均有一定的差異，通常可以以此來區別各藥材。從發生部位來看，其發生原因亦多與薄壁細胞有關，多發生在相當於中柱鞘部位的薄壁細胞的分化而形成的。

結論：異常構造在可以直觀的幫助我們認識藥材的性狀，進行真偽優劣的區分。此外，異常結構在植物分類學、中藥鑒定學、組織化學、中藥材的栽培和合理採收方面都有實際的應用價值。本文對有關異常結構的文獻資料和顯微特徵進行了

比較研究，進一步地瞭解了異常結構的類型和形成等，但亦發現該方面的資料有限且有眾說紛紜的現象。值得更多專家學者進一步深入的探討和研究。

**關鍵字：**異常構造、中藥鑒定、異型維管束，顯微鑒定。

## Abstract

**Objective:** (1) To summarize the types of anomalous structures of plants; (2) To summarize the development and reasons of formation of anomalous structures of plants; (3) To compare the anomalous structures of commonly used Chinese Materia Medica; (4) To compare the commonly used Chinese Materia Medica with the structure of concentric rings.

**Methods :** (1) To compare and summarize the related literatures about anomalous structures of plants; (2) To compare the commonly used Chinese Materia Medica with anomalous structures by observation and microscopic study.

**Result :** From the literatures, anomalous structures not only exist in primary tissue, but also in secondary tissues, forming primary anomalous structures and secondary anomalous structures respectively. Primary anomalous structures include cortex vascular bundles, internal phloem, pith vascular bundles and atactostele of dicotyledon stem. These structures usually occur in dicotyledon stems. Secondary anomalous structures include secondary anomalous structures of fern, gymnosperm, dicotyledon and monocotyledon. The usual anomalous structures usually mean the tertiary structures of dicotyledon. The anomalous structures of dicotyledon include multi-ringed vascular bundles, auxillary stele, interxylary phloem, secondary xylem, secondary structures of pith and interxylary cork. Although the formation of structures varies, they have common characteristics -Lots of paranchymal cells are developed and extra vascular tissues are differentiated from these cells, but the development position may differ. From the experimental observation, the commonly used Chinese Materia Medica with anomalous structures are usually roots or rhizomes. The anomalous structures vary and include concentric rings and heterocentric rings. Their formation positions differ, and the types and quantities of vascular bundles differ and mostly are collateral. The experimental result, agreed with literature, show that the development of anomalous structures is closely related to paranchymal cells; by comparing the cross

sections of root and rhizome decoction piece with concentric rings, they all possess concentric rings. Of different species, the presence and the arrangement of anomalous structures differ in decoction pieces with concentric rings and thus this can be used to authenticate Chinese Medicine. From the point of development positions, the reason of development of concentric rings is closely related to paranchymal cells and mostly happen due to the differentiation of parenchymal cells of pericycle.

**Conclusion :** Anomalous structures can help authenticate Chinese Materia Medica by observation and help judge the quality. Moreover, anomalous structures have valuable application in plant taxonomy, Chinese Materia Medica authentication, tissue chemistry, Chinese Materia Medica cultivation and reasonable harvest. In this thesis, the related literatures and microscopic characteristics about anomalous structures of plants are compared and studied. This leads to the deeper understanding of the types and formation of anomalous structures of plants, and I discovered that the related data and theories are limited and divergent. Thus, it is worth further studying.

**Key words:** anomalous structure; Chinese Materia Medica authentication; anomalous vascular bundles, microscopic indentification.

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