

The History of Cultivation and Use of Medicinal Xinyi in Henan, China

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Xinyi is the name of a Chinese medicinal herb and generally refers to the magnolia flower buds used in traditional Chinese medicine. In China, Xinyi has a history of use of at least 2,000 years; the earliest literature recorded Xinyi in Chinese as Sheng-nong Bencao (herbs of Sheng-nong). Additionally, the literature of Tu-jing Bencao, Bencao Yanyi, Tang Bencao, Hua Jing, Dushu Dingyi, and Zhiwu Mingshitukao recorded the characteristics, medicinal uses, and value of Xinyi.

Based on the descriptions found in the above-mentioned ancient Chinese literature, it seems most likely that the original Xinyi included *M. biondii*, *M. liliiflora*, and *M. denudata*. Because of the increasing use of Xinyi as a traditional medicine in China, additional magnolia research has found that at least ten additional species can be used to produce Xinyi including *M. sprengeri*, *M. sargentiana*, *M. campbellii*, *M. wilsonii*, *M. cylindrica*, *M. zenii*, *M. amoena*, and *M. praecocissima* (*M. kobus*). These ten species have been referred to as the “modern original species” of Xinyi.

As a Chinese traditional medicinal plant in Henan, Xinyi has a long history of use. However, it is not possible to determine from the literature when it was first cultivated in Henan. The oldest cultivated *Magnolia biondii* we can find at present in Henan has a chest-diameter of 50cm, and according to the measurements, is about 400 years old. Thus, Henan Xinyi has at least a 400-year history of cultivation.

Henan produces 70% of the Xinyi in China and is the major producer of Xinyi in the country. Each year, about 200,000 kg of Henan Xinyi are collected from the Funiu Mountain region (Funiushan) in Nanzhao and Nushan and is the main biological product exported.

Professor Zhao Tianbang, who has spent years working on the Henan Xinyi, notes that only *M. biondii* and *M. denudata* have been found

on Funiu mountain (Funiushan) in Henan (natural *Magnolia liliiflora* has never been found in Henan province). As the forests have been largely destroyed by local people, only some 20,000 big trees of *M. denudata* and species related to *M. biondii* exist in the entire Funiushan region. Professor Zhao's work also indicates that most of the magnolia species cultivated in Henan are types of *M. denudata* and *M. biondii*. Thus, as stated earlier, the original botanical species of Henan Xinyi are mainly types of *M. biondii* and *M. denudata*.

Two populations of Xinyi were studied in Henan: the population located on Funiushan behind Xiabiancun village near Nanzhao and the population found at the Xinyang Jigongshan Natural Reserve of Henan.

Xiabiancun village is located approximately 60km from County Nanzhao. The village is at an altitude of 200 meters. Behind the village, at the foot of the mountain, is an agriculture field with a slope of over 300 meters. The field is natural grassland with scattered forests of *Quercus* spp., *Pinus tabulaeformis*, or mixed thickets. Henan Xinyi of varying ages have been planted along the field edges or by roadsides, but most of the plants are medicinal trees planted in recent years for commercial harvest.

Above 300 meters, some older Henan Xinyi are found where they form a valley forest of approximately 30,000 square meters. Most of these old trees are densely grouped on the slope at 370 meters. It is difficult to determine exactly when the Henan Xinyi began to be cultivated here, and the only piece of information we got from the village is that the population has long been protected by the local people as their collection locality of "medicinal Xinyi." This population of approximately 700 magnolia plants, consists of many old trees with chest-diameters of 30-70cm, and heights of over 20 meters. Some of these trees have a tree crown of 10-20 meters. The analysis of these old trees indicates that some trees are at least 200 years old, so this Henan Xinyi population has been in the process of forming for at least 200 years.

All the Xinyi plants at Xiabiancun seem to be grown in a semi-natural condition, but they are said to be natural by the local research botanists and forest technicians. A long time ago, the mountain slope behind Xiabiancun was covered with abundant natural Henan Xinyi species; cutting by local people has reduced the population. All the Henan Xinyi at this location have been left at present because the local people collect the flower buds for medicinal uses.

The plants in this population are very similar to described *M. biondii* with regard to characteristics of tree shape, stems, twigs, and leaves. However, great diversity among the trees can be found in tepal number, size, shape, color, and the developing stages of outer sepaloid tepals, even on the same plant.

Some of typical forms of *M. biondii* found in this region are described below:

- Forms with variation in tepal number, shape, and color. One of these forms has varying numbers of sepaloid tepals (anywhere from zero to three) even on different flowers of the same tree. Others have no sepaloid tepals at all with varying degrees of white to creamy white flowers with purple or creamy spots towards the bases of the tepals. Still others vary from nearly pure purple flowers to white or even creamy yellow. In some plants the sepaloid tepals are more petaloid and of different sizes even on the same tree. Another group of forms have additional tepals (up to 12 including the sepaloid tepals).
- Forms with axillary and terminal flowers (syn. *M. axilliflora* T. B. Chai et al). Again, even within this category of *M. biondii* forms there is variation in flower color on the same plant.

At the Jigongshan Forest Station in Xinyang, Henan (altitude 190 meters) *M. liliiflora*, *M. denudata*, *M. biondii*, *M. sprengeri*, *M. pilocarpa*, and *M. grandiflora* have been cultivated for many years. An interesting cultivated form of *M. liliiflora* was found. This cultivated shrub has the same characteristics as ordinary *M. liliiflora*, but the

petals are mostly white and only the base is purple. Also, the outer three sepaloid tepals differ in size and shape; some of the sepaloid tepals are triangular in shape and some are long lanceolate, with the size of a little petal.

One plant was found at the Forest Station that seems to fit the description of *M. pilocarpa* Z. Z. Zhao and Z. W. Xie (ref. 2). In this plant, the number of tepals (both regular and sepaloid types) varied among flowers on the same tree. Total tepal counts varied from 9 to 11 of which the number of sepaloid tepals varied from 3 to 4. It is said that these characteristics are stable.

The results of this study suggest that the Henan Xinyi are an important group for the study of the deciduous magnolia species in China. A comprehensive study of morphology, cytology, pollen biology and molecular genetics is needed to place the taxa of Henan Xinyi and their hybrids in the correct taxonomic positions.

Additionally, it appears that some Henan Xinyi are still developing as a group. This is indicated by such unstable characteristics as the variations in tepal colour, shape, and size; and the outer sepaloid tepals even in the individual plants. ☞

References

- 1 Chen Baoliang, Nooteboom HP. Notes on Magnoliaceae-III: The Magnoliaceae of China. *Annals of the Missouri Botanic Garden* 1993 80(4).
- 2 Liu Yihu et al. *Flora Republicae Popularis Sinicae*, Tomus 30(1). Science Press 1996.
- 3 Ding BC, Zhao TB et al. The new taxa of Magnolia from Henan. *Journal of Henan Agricultural College* 1983 4.
- 4 Ding BC, Zhao TB et al. The new discovery and the new taxa of Chinese Magnolia. *Acta Agriculturae Universitatis Henanensis* 1985 19(4).
- 5 Zhao Tianbang et al. *Magnolias and its cultivation*. Henan Press of Science and Technology 1992.
- 6 Liu Yihu et al. A new species of Magnolia from Henan. *Bull. Bot. Res.* 1984 4(4).
- 7 Huang Haixin. Observation and study on the morphology variation of *Magnolia biondii* Pamp. *Journal of Wuhan Botanical Research* 1991 9(4).

- 8 Zhao Zhong-zhen et al. A new species and a variety's new nomenclature of the medicinal Xin-yi. *Acta Pharmaceuycica Sinica* 1987 22(10).
- 9 Song Wan-zhi et al. Studies on the medicinal plants of Magnoliaceae-II: Botanical origins of the Chinese drugs of Xin-yi and Hou-pu. *Acta Pharmaceuycica Sinica* 1984 19(3).
- 10 Song Wan-zhi et al. Studies on the medicinal plants of Magnoliaceae-III: Botanical origins and resource utilisation of the Chinese drug Hou-pu. *Acta Pharmaceuycica Sinica* 1984 15(3).
- 11 Frodin DG et al. World checklist and bibliography of Magnoliaceae. Royal Botanical Garden Kew 1996.

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