

Magnolia ‘Xiaoxuan’: A New Dwarf *Magnolia* Cultivar

Bin Xie, Yaling Wang, and Shu Yang

Xi’an Botanical Garden of Shaanxi province and Shaanxi Engineering Research Centre for Conservation and Utilization of Botanical Resources, Xi’an, China, 710061

The cultivar *Magnolia* Xiaoxuan is named after a Chinese girl’s name that refers to a short height and beautiful flowers. The lateral branches of *M. ‘Xiaoxuan’* begin to occur at the same time the main branches sprout, the characteristics of which are completely different from other taxa of *Magnolia* subgenus *Yulania*. *Magnolia ‘Xiaoxuan’* has a smaller leaf size and plant shape, with denser flowers, and could be suitable for pot plants and small garden plants. On 24 Jul 2019, the National Forestry and Grassland Administration for the Protection of New Varieties of China approved the release of the new cultivar *M. Xiaoxuan* (Xie et al. 2020), which is owned by Xi’an Botanical Garden of Shaanxi Province (patent no. 20190045; Wang et al. 2019). On 22 Jun 2016, the cultivar *M. Xiaoxuan* was registered officially with Magnolia Society International. On 28 Jun 2021, the cultivar *M. Xiaoxuan* obtained the patent given by the Office of Plant Variety Protection of the US Department of Agriculture (patent no. 20200425; Wang 2021).

Origin

Magnolia ‘Xiaoxuan’ is a hybrid generation of *Magnolia stellata* ‘Waterlily’ and *Magnolia maudiae* (D.) Figlar var. *platypetala* ‘Xin Hanxiao’. *Magnolia stellata* ‘Waterlily’ is a small tree with dense flowers and is resistant to waterlogging. *Magnolia ‘Xin Hanxiao’* is an evergreen tree with fragrant flowers, a long flowering period, and is cold tolerant. The aim of hybridization is to obtain a semievergreen variety with a long flowering period. In 2008, cross experiments were conducted Yaling Wang of Xi’an Botanical Garden. Only one seed was obtained and seeded in a clay pot (Wang et al. 2014). The following year, the seedling growth was healthy, and its compact shape aroused significant attention. The differences between the hybrid and its parents were significant. The seedling was of a compact shape with obviously short internodes of about 1.5 cm (Fig. 1). The leaves were unusually gray-green. The hybrid seedling finally bloomed after 5 years, on 26 Jun 2013.

Received for publication 2 Mar 2023. Accepted for publication 22 May 2023.

Published online 12 Jul 2023.

Y.W. is the corresponding author. E-mail: wangyl100@aliyun.com.

This is an open access article distributed under the CC BY-NC-ND license (<https://creativecommons.org/licenses/by-nc-nd/4.0/>).

The similarities and differences between *M. ‘Xiaoxuan’* and its parents are shown



Fig. 1. One-year seedling of *Magnolia ‘Xiaoxuan’*.

Table 1. The similarities and differences between *Magnolia ‘Xiaoxuan’* and its parents *M. stellata* ‘Waterlily’ and *M. ‘Xin Hanxiao’*.

Characteristic	<i>M. Xiaoxuan</i>	<i>M. stellata</i> Waterlily	<i>M. Xin Hanxiao</i>
Seasonality	Semi-evergreen	Deciduous	Evergreen
Growth habit	Upright	Spreading	Spreading
Height	Very short	Short	Short
Density of branches	Sparse	Sparse	Medium
Position of flower buds on branch	Terminal only	Terminal only	Axillary only
No. of terminal or axillary flowers on branch	Only one	Only one	Only one
Fruiting formation	Absent	Few	Medium
Flower shoot, length of internodes	Short	Medium	Medium
Flower shoot, thickness	Thin	Thin	Medium
One-year-old branches, color of shoot	Green	Yellow-brown	Green
Leaf blade, shape	Narrow obovate	Medium obovate	Broad obovate
Leaf blade, length	Very short	Very short	Medium
Leaf blade, texture	Thin, leathery	Thin, papery	Leathery
Leaf blade, color in autumn (only for deciduous)	Green	Yellow	Green
Flower, fragrance	Weak	Weak	Strong
Flower, shape	Cup-shaped	Stellate	Cup-shaped
Flower, no. of tepals	Few	Many	Few
Time of beginning of vegetative growth in relation to flowering	Before and at the same time	Before	At the same time
Time of beginning of first flowering	Medium	Early	Medium
Length of flowering period	Long	Short	Long
Flowering frequency	More than once	Once	More than once
Time of beginning of leaf fall	Medium	Early	—

in Table 1. The cultivar is triploid by flow cytometry, which is different from its diploid parents. It is speculated that nonmeiotic microspore pollination forms triploid. Its red flower is different from the two parents, which is white. Further research is needed to study the differences.

Description and Performance

Magnolia ‘Xiaoxuan’ is a very small tree. The starting time for the beginning of vegetative growth and leaf germination is in middle or late March. The florescence of *M. ‘Xiaoxuan’* is about 5 months long, from early April to mid-September, with a short pause of about 1 month in June.

The 14-year-old female parent is only 2.0 m high. Grafted plants of 1-year-olds are only 10 to 20 cm and can reach 25 to 30 cm if flowering is controlled. The grafted plants are only 30 to 40 cm high after 3 years and 150 cm high after 6 years (Supplemental Fig. 1).

Magnolia ‘Xiaoxuan’ is a compact plant with dense foliage and a compact shape. One to 3-year-old branchlets are thin and weak, and gray-green. The leaves grow alternately on branches. The leaves are obovate-elliptic with an acuminate apex and bases. The upper side of the leaf is green with white pubescence along the veins, and the lower side is gray-green with densely white pubescence. The leaves are 6 to 9 cm long and 2.5 to 3.5 cm wide (Supplemental Fig 2).

The positions of flower buds on branches are terminal only, blooming profusely because of the dense branches. The flowers are red and cup-shaped, and 8 to 9 cm in diameter. The flowers have 9 to 10 tepals that are obovate and have a fleshy texture. The tepals



Fig. 2. Morphological characters of *Magnolia* 'Xiaoxuan' flowers: (A) individual flower, (B) tepals, and (C) flowers on the tree.

are curly longitudinally in the full-bloom stage. The tepals are 5.5 to 7.0 cm long and 2 cm wide, similar in both the first and second whorls. The tepals of the third whorls are smaller than those of the outer whorls. The color is red-purple [Royal Horticultural Society (RHS) 64A-69D] on the outside and white (RHS N155B) inside (Royal Horticultural Society 2007) (Fig. 2). Flower color changes because of the different climates each year. The florescence in spring can last for 1 month. It is a rare and very short variety with a long flowering period.

Magnolia 'Hong Xiaoxing' was chosen as a similar variety to compare with *M.* 'Xiaoxuan' because it is the closest in relation among the known varieties (Lobdell 2021). *Magnolia* 'Hong Xiaoxing' is a hybrid generation between *Magnolia liliiflora* 'Hong Yuanbao' and *Magnolia laevifolia* (Y. W. Law & Y. F. Wu) Nootboom. *Magnolia*

'Xiaoxuan' is similar to *M.* 'Hong Xiaoxing' in its semigreen type, small leaves, multiple flowering, compact and dense branches, and triploid chromosome.

Magnolia 'Xiaoxuan' and *M.* 'Hong Xiaoxing' can be different in growth speed and tepal shape (Table 2). The plant of *M.* 'Xiaoxuan' is only 2.0 m high at 14 years of age, whereas *M.* 'Hong Xiaoxing' is 4 m high at 14 years. The tepals of *M.* 'Xiaoxuan' of the outer and inner whorls are all nearly the same shape. However, the tepals of the outer whorls of *M.* 'Hong Xiaoxing' are sepaloid and tongue-shaped. In addition, the position of flower buds on the branch of *M.* 'Xiaoxuan' is terminal, whereas that of *M.* 'Hong Xiaoxing' can be terminal, axillary, or clustered.

Dissemination of Cultivars

Magnolia 'Xiaoxuan' is hardy in Zones 7 to 10. It is best suited to loose, fertile soil with good drainage. Regional trials have been carried out in China. The results show that the cultivar is adaptable to be planted in areas of China that are subtropical or southern temperate.

The cultivar requires sufficient light and would bear few or no flowers in a semishade or shade environment. However, compared with other magnolia cultivars, *M.* 'Xiaoxuan' has a stronger ability to tolerate semishade. It can still bloom under semishade conditions. Grafting propagation is generally conducted in early spring or autumn using the seedlings of *Magnolia denudata* Desr., *Magnolia biondii* Pamp., or *Magnolia champaca* (L.) Bail-

lon ex Pierre as rootstocks, which are easy to collect and can be well adapted in China.

Row spacings of 1.2 to 1.5 m and a 1-m plant spacing are recommended for large plantlets. We recommend that plantlets 40 to 50 cm high should be transplanted while dormant. Soil balls are required to keep more intact roots.

The newly transplanted seedlings need enough water to keep the soil moist. After 2 years, seedlings can be planted without special management, unless very dry weather is encountered.

The branches sprouting from the rootstock need to be cut when they grow. Few prunings can be performed as needed. Plants should be fertilized before and after flowering every year.

Availability

Cultivar *M.* Xiaoxuan is maintained by Xi'an Botanical Garden of Shaanxi Province (Xi'an, China). Potted/planted breeding material for *M.* 'Xiaoxuan' is produced by Heritage Seedlings & Liners, Inc. Requests for the cultivar should be addressed to author Y.W. (E-mail: wangyl100@aliyun.com).

References Cited

- Royal Horticultural Society. 2007. Royal Horticultural Society colour chart. Royal Horticultural Society, London, UK.
- Lobdell MS. 2021. Register of *Magnolia* cultivars. HortScience. 56:1614–1675.
- Wang J, Wang XL, Zhao QM, Song XW, Yan DF. 2014. Research advance in Magnoliaceae cross-breeding. Anhui Agric Sci. 42(16):5084–5087.
- Wang Y (inventor). 2021. Xi'an Botanical Garden of Shaanxi Province, China (assignee). US Plant Patent 20200425. (Filed 22 Jun 2020, granted 28 Jun 2021).
- Wang Y, Zhao S, Zhao Q, Wu J, Wang J, Yan D, Ye W (inventors). 2019. Palm Eco-Town Development Co., Ltd., Xi'an Botanical Garden of Shaanxi Province, China (assignee). US Plant Patent 20190045. (Filed 4 Nov 2016, granted 24 Jul 2019).
- Xie B, Wang YL, Ye W. 2020. A new magnolia cultivar 'Xiaoxuan'. Yuan Yi Xue Bao. 47(5): 1015–1016.

Table 2. Morphological and phenological differences between *Magnolia* 'Xiaoxuan' and *M.* 'Hong Xiaoxing'.

Characteristic	<i>M.</i> Xiaoxuan	<i>M.</i> Hong Xiaoxing
Plant height	Very short (2 m of 14-year-old grafting)	Short (4 m of 14-year-old seedling)
Leaf shape	Obovate-elliptic	Obovate-elliptic, obovate-circle
Leaf size	6–9 cm long, 2.5–3.5 cm wide	9–11 cm long, 3.9–6.0 cm wide
Tepal color	Red exterior (RHS [†] 64A-69D), light-red interior (RHS N155B)	Purple-red exterior (RHS 73A), white interior (RHS 69B)
Sepaloid tepals	Absent	Present

[†] RHS = Royal Horticultural Society (2007).



Supplemental Fig. 1. Morphological characteristics of *Magnolia* 'Xiaoxuan' grafting: (A) height, (B) crown width, and (C) ground diameter.



Supplemental Fig. 2. Morphological characteristics of *Magnolia* 'Xiaoxuan' foliage.