Magnolia wufengensis ‘Jiaohong No. 1’: A *Magnolia* Cultivar with Striking Red Flowers

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Additional index words. *Magnolia wufengensis*, magnolia cultivar, Magnoliaceae, red flower

In 2004, a magnolia tree displaying a rare phenotype was observed in a secondary forest at an elevation of 4908 ft (1496 m) in Wufeng County, Hubei Province, China. On further investigation in subsequent years, this tree was verified as belonging to a new species in Magnoliaceae, which was named *Magnolia wufengensis* (Ma et al., 2006). With the ongoing efforts of Luyi Ma, Luorong Wang, and Xin Liu, this rare phenotype has been propagated vegetatively via grafting. On July 31, 2012, the State Forestry Administration Office for the Protection of New Varieties approved the release of the new cultivar *M. wufengensis* Jiaohong No. 1, which is under patent protection by Beijing Forestry University (patent no. 20120073). In 2015, it was authorized as an improved variety of forest tree of Hubei Province (certificate no. S-SV-MW-012-2013). Because of the presence of only one remaining *M. wufengensis* individual in its natural habitat, ‘Jiaohong No. 1’ has been cultivated and introduced both to preserve the *M. wufengensis* germplasm and propagate it for public view.

Origin

The cultivar epithet is derived from the Chinese name “Jiaohong,” which means “China red” and refers to the striking red color on both sides of the tepal and the native habitat of the species. Tracing its origin to a secondary forest in Wufeng County, ‘Jiaohong No. 1’ was first propagated and trialed in 2004 through introduction and domestication experiments in Heshengqiao Town, Xian’an District, Xianning, Hubei Province. *M. wufengensis* is relatively self-infertile and produces only a small number of seeds.

This work was supported by the Special Fund for Forest Scientific Research in Public Welfare (201504704).

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Therefore, the cultivar was vegetatively maintained through grafting onto *Magnolia biondii* rootstocks. In the autumn of 2004 and 2005, the team led by Luyi Ma collected branches from *M. wufengensis* and cultivated nearly 600 grafted plantlets at the testing ground in Xianning. More than 100 grafted plantlets survived. In the autumn of 2006, 2007, and 2008, branches from the surviving grafted plantlets were successively collected and nearly 4700 second- and third-generation grafted plantlets were cultivated. A 90% survival rate was attained for the grafted plantlets. In the Spring of 2008, 13 grafted plantlets began to flower. In the Spring of 2009, 65 grafted plantlets flowered, and in the Spring of 2010, nearly 400 grafted plantlets flowered. Thus, it took 3–4 years for plantlets to flower after initial propagation. The second-generation plantlets propagated by

grafting took 1–2 years to flower. This was a remarkable milestone for the success in breeding ‘Jiaohong No. 1’, which displays the same traits as *M. wufengensis*.

Description and Performance

As with the natural species, ‘Jiaohong No. 1’ is expected to reach a mature height of 15–20 m. The red, fragrant, cup-shaped flowers bloom profusely before the spring foliage; the flowers are solitary and erect at branch tips (Fig. 1).

All tepals are petaloid, with nine (rarely 10 or 11) broad-obovate tepals. The tepal color changes gradually as the flower matures. Young flowers are a moderate purplish red (RHS 57A) on the outside and a vivid purplish red (RHS 61C) on the inside. As they mature, the tepals turn a strong purplish red (RHS 67A) to vivid purplish red (RHS 67B) on the outside and a vivid purplish red (RHS 67B) to deep purplish pink (RHS 67C) on the inside. The tepal color is relatively stable from year to year under the influence of climate and site conditions.

The leaves have entire margins and grow alternately or sometimes spirally on the branches, with a dark green color on the adaxial side and a gray-green color on the abaxial side (Fig. 2). Leaves of ‘Jiaohong No. 1’ are obovate-elliptic, with gradually cuneate bases and broad, rounded, and slightly concave apices. The fruit is a cone-like follicle embedded with dark brown, broadly ovate seeds.

The distinctiveness of ‘Jiaohong No. 1’ can be demonstrated by a comparison with *Magnolia liliiflora*, a closely related species of Magnoliaceae (Table 1). Unlike ‘Jiaohong No. 1’, *M. liliiflora* is a shrub or exceptionally small tree, with a height of 3–5 m. The flower of *M. liliiflora* is pink to purple on the outside and pale on the inside, whereas the flower of ‘Jiaohong No. 1’ is evenly red on both sides.

Fig. 1. Morphological characters of *Magnolia wufengensis* ‘Jiaohong No. 1’ flowers: (A) flowers on tree, (B) individual flower, (C) abaxial side of tepals, and (D) adaxial side of tepals. Scale bar in C and D is 5 cm.

Fig. 2. Morphological characters of *Magnolia wufengensis* 'Jiaohong No. 1' foliage: (A) branch with flower bud, (B) branch, (C) adaxial side of leaf, and (D) abaxial side of leaf.

Table 1. Morphological differences between *Magnolia wufengensis* 'Jiaohong No. 1' and *Magnolia liliiflora*.

Characters	<i>M. wufengensis</i> 'Jiaohong No. 1'	<i>M. liliiflora</i>
Tree type	Large tree (15–20 m tall)	Shrub or small tree (3–5 m tall)
Flower	Precocious	Appearing with leaves
Tepal number	9 (–11), all petaloid	9–12, including three sepaloid tepals
Tepal color	Evenly red on both sides	Pink to purple outside, whitish inside
Leaf shape	Broad rounded and slightly concave at the apex	Abruptly acute to acuminate at the apex

Furthermore, *M. liliiflora* has 9–12 tepals, among which 3 tepals are sepaloid, whereas 'Jiaohong No. 1' has nine (rarely 11) petaloid tepals. Another distinctive difference is the leaf shape; *M. liliiflora* has abruptly acute to acuminate leaf apices.

Dissemination of Cultivars

'Jiaohong No. 1' is hardy from USDA Zones 7–10 and is best suited to acidic to neutral fertile soil with good drainage. Regional trials have been carried out and the cultivar is favorable for propagation in Northern China, Central China, Southwestern China, and Southern China areas with warm temperate, subtropical, or tropical climates.

The cultivar generally requires full-sun conditions and is slightly shade-tolerant.

Propagation by single-bud grafting is generally conducted in autumn using *M. biondii* as the rootstock.

A planting density of 2 × 3 m is recommended for large plantlets. Winter or early spring is suitable for transplanting large plantlets; it is important to note that soil balls are required to avoid hurting the roots. Appropriate transplanting and fertilizing depth contributes to fewer tillers and a good growth rate.

Top application of fertilizer is of critical importance before and after flowering. Based on the yearly growth cycle of 'Jiaohong No. 1', the best times for top dressing are in late February and late May, which promote flower opening and flower bud initiation, respectively. In times of drought, irrigation is necessary to retain soil moisture.

Pruning and trimming are best conducted in autumn or winter when the leaves have fallen. Tillers need to be cut at first sight.

Availability

In 2016, 'Jiaohong No. 1' became commercially available from Wufeng Boling Magnolia Technology Development Co., Ltd. Requests for the cultivar should be addressed to the coauthor Dr. Ziyang Sang (E-mail: sangziyang@21cn.com).

Literature Cited

- Ma, L.Y., L.R. Wang, S.C. He, X. Liu, and X.Q. Wang. 2006. A new species of *Magnolia* (Magnoliaceae) from Hubei, China. *Bul. Bot. Res.* 26:4–7.