

‘Chilongzhua’ and ‘Yanzhizui’: Two Interspecific Hybrid Cultivars of *Michelia*

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The genus *Michelia* L. (Magnoliaceae) comprises ≈70 species of tropical or subtropical evergreen trees or shrubs distributed in Asia (Xia et al., 2008). Some of these species are well known as horticultural plants in landscape gardening (Tian, 2007; Zhang et al., 2007). *Michelia crassipes* Law is an evergreen shrub native to southeastern China (Xia et al., 2008) where it is widely cultivated for its purple flowers that are unique in the genus (Liu, 2004). Thus, this characteristic makes *M. crassipes* highly desirable in breeding new cultivars because the flowers of most species of *Michelia* are white or yellow (Liu, 2004). Up to now, four cultivars have been selected or bred from *M. crassipes* (Gong et al., 2003; Liao, 2007). *Michelia crassipes* ‘Mozi’ is a commercially available selection introduced by the Hunan Province Forest Botanical Garden that has larger, dark purple flowers with a silver edge, which occurred as a spontaneous mutation on a plant growing wild in Hunan (Liao, 2007). Three cultivars, including *M.* ‘Yujin’, *M.* ‘Danxin’, and *M.* ‘Qinfang’, are interspecific hybrids between *M. crassipes* and *M. yunnanensis*. *M. calcicola* C. Y. Wu is an evergreen tree native to the subtropical limestone forests of southeastern and eastern China (Liu, 2004). It has attractive, large, yellow flowers with a size of 8 to 10 cm in diameter. Both *M. crassipes* and *M. calcicola* flower from March to May with single flowers lasting from 5 to 7 d. *M.* ‘Chilongzhua’ and *M.* ‘Yanzhizui’ are hybrids of *M. crassipes* and *M. calcicola* selected for their distinctive flower color and fragrance.

Origin

Controlled hybridization was made between *M. crassipes* (♀) (Fig. 3) and *M. calcicola* (♂) (Fig. 4) at the Kunming Botanical Garden in Yunnan province, China, in 2001. *M. crassipes* was derived from individuals introduced from Jinggang Mountain

in Jiangxi province, China, in 1988. *M. calcicola* came from seeds wild-collected from Xichou County in Yunnan province, China, in 1986. Mature carpidium fruits were collected in Oct. 2001, and the hybridized seeds were extracted from the arils and stored in moist sands until the next spring. In Apr. 2002, the hybridized seeds were sowed using a normal procedure. Twenty-six F₁ plants flowered in 2005. Based on the characteristics of the plant form, leaves, and flowers, two individuals (*M.* ‘Chilongzhua’ and *M.* ‘Yanzhizui’) were selected and propagated by in vitro micropropagation for further evaluation. Studies on the morphology (including plant form, flower color and conformation, leaf anatomy, and epidermal micromorphology) and inheritance of these traits as well as pollen viability, anthesis biology, and cytology in *M. crassipes* (♀), *M. calcicola* (♂), and their F₁ hybrids are reported (Ji et al., 2009; Ji and Sun, 2011). The study indicated that fresh pollen of parent plants could germinate to more than 90%; however, the mean pollen germination of F₁ hybrids was only 57.7% (Ji and Sun, 2011). Colors were designated using the Royal Horticultural Society (RHS) Color Chart (Royal Horticultural Society, 1996). In 2011, *M.* ‘Chilongzhua’ and *M.* ‘Yanzhizui’ have been evaluated and registered as new cultivars at Kunming by the National Ministry of Forestry in China.

Description

M. ‘Chilongzhua’ (Fig. 1) is an evergreen, conical, upright-growing, medium-sized shrub that reaches a height of 3.7 m and a width of

2.3 m after 7 years of field growth under full sun conditions in Kunming. Mature leaves are elliptic, 9.84 to 14.23 cm long, and 3.92 to 5.74 cm wide. Dense long grayed orange (RHS 175A) hairs cover the leafstalks of young leaves, buds, peduncles, and twigs. Foliage is thick, leathery with short yellow hairs on the middle vein. Leaf tips are acuminate, leaf bases are wedge-shaped, and leaf margins are entire. Foliage is dark green (RHS 139A) on the abaxial surface and green (RHS 138B) on the ventral surface. Young leaves are covered with soft, short hairs. Flowers are born in the axils and appear in early March and peak in late March continuing to early April in Kunming (Fig. 1). Flowers are 6.2 cm wide when they open and consist of six to 10 ovate tepals in two to four whorls, which are 2.7 to 4.1 cm in length and 0.6 to 2.1 cm in width with several red–purple androgynous androeciums. Flowers are yellow (RHS 2D) with rose–purple (RHS 68A) streaks on the edge and lower half of the outside in full sunlight (Fig. 1). On the upper surface, the centers of flowers have red–purple (RHS 74C) streaks. Purple stamens have dark red–purple (RHS 59A) stalks and amaranth (RHS 57D) anthers. Flowers are fragrant with single flowers lasting for 5 to 6 d.

M. ‘Yanzhizui’ (Fig. 2) is an evergreen, broadly columnar, upright shrub that reaches 2.4 m high and 1.8 m wide after 7 years of field growth under full sun conditions in Kunming. The leaves are thick, leathery with dark green (RHS 139A) abaxial surface and a green (RHS 138B) ventral surface and short yellow hairs on the middle veins. The surfaces of buds, peduncles, leafstalks of young leaves, and twigs have dense long grayed orange (RHS 175A) hairs. Leaves are elliptic, up to 14.2 cm long × 5.1 cm wide, narrow, short acuminate at the tip and wedge-shaped convex at the base with entire leaf margins. Tepals number from seven to 10 in three to four whorls. Flowers are green–yellow (RHS 1D) on the upper surface and pale yellow (RHS 4D) on the lower surface with red–purple (RHS 67C) edges in full sunlight (Fig. 2). The fragrant flowers have rose–purple streaks, marking the outside of the base of tepals. The flower center is red–purple (RHS 64C) on the margin, becoming deep red–purple (RHS 64B) toward the center of the flowers (Fig. 2). Purple stamens have dark red–purple (RHS 59A)



Fig. 1. Flower of *Michelia* ‘Chilongzhua’ in full sun in the morning.

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Fig. 2. Flower of *Michelia* 'Yanzhizui' in full sun in the morning.



Fig. 3. Flower of *Michelia crassipes* (♀) in full sun in the morning.

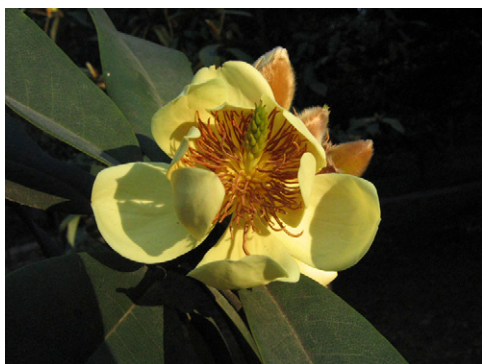


Fig. 4. Flower of *Michelia calcicola* (♂) in full sun in the morning.

stalks and amaranth (RHS 57D) anthers. Occasionally, one to three andropetalous androecium appear. Flowering begins in Kunming in early March and peaks in late March to early April. Single flowers continue for 4 to 7 d. Fruits mature from September to October with one to two red seeds in each follicle.

Culture

M. 'Chilongzhua' and *M.* 'Yanzhizui' should be planted in full sun to promote flowering. No diseases or pests have been observed at Kunming Botanic Garden. However, freezing temperatures may damage flower buds and reduce flowering.

Propagation

Propagation of 'Chilongzhua' and 'Yanzhizui' has been achieved successfully *in vitro* using the method described by Fu and Sun (2006). Apical shoots were harvested in spring as explants and placed onto Solidified H medium, which was supplemented with 1.0 mg·L⁻¹ 6-benzyladenopurine (BA) and 0.1 mg·L⁻¹ indole-3-acetic acid (IAA). Shoots obtained were multiplied in Murashige and Skoog (MS) medium supplemented with 0.5 mg·L⁻¹ 6-BA and 0.1 mg·L⁻¹ IAA. In half-strength MS medium supplemented with 1.5 mg·L⁻¹ naphthylacetic acid, rooting of shoots could increase to greater than 90%. Rooted plantlets were transferred to the soil containing red soil:humus soil:pearlstone (1:1:1) and the percentage of survival was 90%. *In vitro*-propagated plants have been cultured for 2 years in Kunming Botanic Garden.

Availability

In 2011, *M.* 'Chilongzhua' and *M.* 'Yanzhizui' were reviewed and registered as new cultivars at Kunming by the National Ministry of Forestry in China. A China plant patent has been submitted and approved for 'Chilongzhua' and 'Yanzhizui'. Propagation and production rights have not been assigned to a specific commercial partner.

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