Prunus davidiana ‘Qingtian’

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David’s peach [*Prunus davidiana* (Carrière) Franch], a member of the Rosaceae family, is a tree with strong environmental adaptability that prefers high light; tolerates cold, drought, and low nutrient conditions; and exhibits sensitivity to waterlogging (Zhang et al., 2019). It is distributed mainly in Shandong, Hebei, Henan, Shanxi, Shaanxi, Gansu, Sichuan, and Yunnan provinces in China (Zheng et al., 2014). It grows between 800 and 3200 m above sea level (Guan et al., 2014; Li et al., 2014). It is used primarily in North China as an ornamental plant and rootstock for *P. persica* (L.) Batsch, *P. mume* Sieb., *P. salicina* Lindl., and other stone fruit tree species (Zhang et al., 2019).

Prunus davidiana ‘Qingtian’ is a new cultivar with a unique growth habit that was bred by Shandong Agricultural University. This cultivar has garnered significant attention for its tall, fastigate, and undulating growth habit (Fig. 1). This unique cultivar represents a novel addition to the growth forms available for landscape planting and for *P. davidiana* germplasm resources.

Origins

More than 1000 seeds of *P. davidiana* were collected in western China during Fall 2013 and were stratified in moist sand at 1 to 10 °C. The seeds were then sowed in a field at the Fruit Tree Root Laboratory of the College of Horticulture Science and Engineering, Shandong Agricultural University. Approximately one-third of the seeds emerged in Spring 2014 (Tai'an, Shandong Province, China: lat. 36°05'N, long. 117°03'E; 153 m above sea level), a region with a temperate monsoon climate. In 2015, after the seedlings had flowered and borne fruit, an individual plant with a tall, fastigate, and undulating growth habit was selected for further evaluation and designated ‘Qingtian’. From 2016 to 2021, this selection was grafted onto *P. persica* (L.) Batsch rootstock seedlings, and a series of studies on its biological characteristics were performed. The morphology of

‘Qingtian’ was compared with that of typical *P. davidiana* as the control. The propagated plants grew well, and every individual retained the unique growth habit features. No serious diseases or pests, such as crown gall disease, *Cnidocampa flavescens* (Walker), or *Hyalopteris arundinis fabricius*, were observed, which enhanced its ornamental potential.

Description

Prunus davidiana ‘Qingtian’ has dark-brown mature shoots with lenticels, a broadly lanceolate leaf shape, and light pink [Royal Horticultural Society (RHS)-65B] flowers with broad, ovate petals. This new cultivar, Qingtian, was compared with *P. davidiana* (Table 1). *P. davidiana* is characterized by dark-purple (RHS-72B) 1-year-old shoots, a circular petal shape, and a light-yellow (RHS-20A) fruit color. The new cultivar has brown (RHS-N199C) 1-year-old shoots with gray (RHS-N200C) stripes, a broad ovate petal shape, and a light-green (RHS-142D) fruit color. The two cultivars have distinct growth habits, with *P. davidiana* exhibiting spreading growth, whereas ‘Qingtian’ is fastigate and undulating.

Habit and branching. ‘Qingtian’ is tall and vigorous, fastigate in shape, with an undulating growth habit (Fig. 2). The internode length of 1-year-old shoots is 2.1 to 5.9 cm. The branches of 1-year-old plants are brown (RHS-N199C) with a wavy gray (RHS-N200C) epidermis (Fig. 3), and the mature branches are dark brown (RHS-200C) with lenticels. The

trees grew to an average of 12.2 m in height over the course of 3 years.

Leaves. The leaves (Fig. 4) are wavy, green (RHS-139C), 8.9 to 14.6 cm long, and 2.1 to 4.1 cm wide. The petioles are 2.2 to 2.7 cm long and hairless, with nonobvious glands. The leaf shape is broadly lanceolate, and the aspect ratio of the leaf blade is 2.7 to 3.4.

Flowers. The bloom time (10% open flowers) of ‘Qingtian’ occurs in late March in Tai'an, Shandong, and flowering lasts until late April. The buds are a single pink color (RHS-68C) and are long and ovate. The flowers (Fig. 5) are single with a shallow cup and are 2.1 to 3.0 cm in diameter. Each flower has five petals, which are 1.1 to 1.5 cm long and 0.7 to 1.2 cm wide, with a single light-pink color (RHS-65B) and a broad, ovate shape. The stamens are shorter than the petals, there is one pistil per flower, the stigma is almost the same length as the anthers, and the anther is orange-red (RHS-39B).

Fruit. ‘Qingtian’ sets a small number of fruit (Supplemental Fig. 1) that are a single light-green color (RHS-142D) with a pubescent exocarp. The fruit are small and circular. Their vertical diameter is ≈2.2 to 2.5 cm, and their transverse diameter is ≈2.3 to 2.6 cm. The pits (Fig. 6) are circular with many nuclear lines.

Cultivation and Pest Management

‘Qingtian’ is suitable for cultivation in Shandong, Hebei, Henan, Shanxi, Gansu, Sichuan, and Yunnan provinces in China. For ornamental planting, it is recommended that this new cultivar be cultivated in thick, moist loam soil with good drainage and a soil pH of 6 to 7.5. The plant is propagated primarily by grafting onto peach seedling rootstocks. Healthy and plump buds (scions) are collected in the autumn (August–September) from mature branches of the current year. Plastic wrappers should be removed and the rootstock pruned during the following spring. After germination, the rootstock sprouts should be removed three to four times to ensure the growth of the grafted buds. Regular

Fig. 1. Growth habit of 5-year-old *P. davidiana* ‘Qingtian’.

Fig. 2. Growth habit of 2-year-old *P. davidiana* ‘Qingtian’.

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Table 1. Comparison of the main physiological characteristics of *P. davidiana* and *P. davidiana* ‘Qingtian’.

Characteristic	<i>P. davidiana</i>	<i>P. davidiana</i> ‘Qingtian’
Growth habit	Spreading	Fastigiate, undulating
1-year-old branch color	Dark purple (RHS-72B)	Brown (RHS-N199C) with a wavy, gray (RHS-N200C) epidermis
Mature branch color	Dark brown (RHS-200B)	Dark brown (RHS-200C) with lenticels
Leaf shape	Lanceolate	Broadly lanceolate
Petal color	Pink (RHS-63B)	Light pink (RHS-65B)
Petal shape (excluding petal stalks)	Circular	Broad ovate
Fruit color	Light yellow (RHS-20A)	Light green (RHS-142D)
Pit shape	elliptic	Circular

RHS = Royal Horticultural Society.

pruning to keep the branches short is critical to ensure flowering the next year. Observations have indicated that this cultivar has a low incidence of pests and diseases. Other management techniques are those used for ordinary ornamental trees (Yin et al., 2021; Zhang et al., 2020).

Availability

P. davidiana ‘Qingtian’ is available from Zhendong Nursery (Tai’an, Shandong, China). Please direct all inquiries to Duojiang Zhang (e-mail: 1170345630@qq.com).

Literature Cited

Guan, F.C., S.P. Wang, R.Q. Li, M. Peng, and F.J. Meng. 2014. Genetic diversity of wild peach (*Prunus mira* Koehne) from different altitudes in the Tibetan plateau by pollen morphous and RAPD markers. *HortScience* 49:1017–1022, <https://doi.org/10.21273/HORTSCI.49.8.1017>.

Li, T.F., J.R. Liu, Y.N. Xie, Q.Y. Wang, and F.J. Meng. 2014. Analysis of genetic diversity in *Prunus mira* Koehne ex Sargent populations using AFLP markers. *Plant Syst. Evol.* 300:475–482, <https://doi.org/10.1007/s00606-013-0896-5>.

Yin, Y.J., X.L. Cui, L.L. Zhang, Y.F. Mao, X.F. Su, Y.P. Liu, H.L. Pang, and X. Shen. 2021. ‘Dai Long’ crabapple. *HortScience* 56:982–984, <https://doi.org/10.21273/HORTSCI.56.9.982>.

Zhang, C.L., F.X. Liu, Z.X. Wang, Z.Z. Liu, and L. Jiang. 2019. Study on ‘Xiacui’ grafting on different seedling peach rootstocks. *Northern Fruits* 4:9–12. (In Chinese), <https://doi.org/10.16376/j.cnki.bfgs.2019.04.003>.

Zhang, L.L., Y.F. Mao, Y.Y. Wang, L. Yang, Y.J. Yin, and X. Shen. 2020. *Malus spectabilis* ‘Duojiang’: A new yellow-leaf cultivar. *HortScience* 55:1155–1158, <https://doi.org/10.21273/HORTSCI.55.11.1155>.

Zheng, Y., G.W. Crawford, and X. Chen. 2014. Archaeological evidence for peach (*Prunus persica*) cultivation and domestication in China. *PLoS One* 9:e106595, <https://doi.org/10.1371/journal.pone.0106595>.

Fig. 3. Comparison of 1-year-old shoots and flowers of (left) *P. davidiana* and (right) *P. davidiana* ‘Qingtian’.

Fig. 5. Flowers of *P. davidiana* ‘Qingtian’.

Fig. 4. Comparison of leaves of (top) *P. davidiana* and (bottom) *P. davidiana* ‘Qingtian’.

Fig. 6. Comparison of pits of (left) *P. davidiana* and (right) *P. davidiana* ‘Qingtian’.

Supplemental Fig. 1. The original photo of fruit in *P. davidiana* 'Qingtian'.