

‘Donglin Shuying’: A New *Iris sanguinea* Cultivar

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Iris sanguinea is a perennial herb with high ornamental value, and its flowers are brightly colored and unique, with strong resistance to disease, water and humidity, and cold. As an excellent material for landscaping in cold areas, it can be widely used as a landscape planting for flowerbeds, garden borders, and potted plants, among others. It is also an emerging material for cut flowers with broad development and application prospects.

The breeding of new *I. sanguinea* cultivars are mainly through crossing, *I. sanguinea* and *I. sanguinea* f. *albiflora* are the most used breeding parents. The flower color of *I. sanguinea* f. *albiflora* is white (Yang et al. 2019), and that of *I. sanguinea* is blue (Li et al. 2018). By crossing *I. sanguinea* and *I. sanguinea* f. *albiflora*, some new cultivars have been developed, such as ‘Ban Die’ (Wang and Wang 2017), ‘NEFU-1’ (Qi et al. 2020), ‘Flower Angel’ (Fan et al. 2021), ‘Dong Lin Zi’ (Yang et al. 2022), and ‘Qihuan Zi’ (Fan et al. 2022). Although these new cultivars have been greatly improved in flower color, the flower type is still the same as that of their parents. Here, we report the release of the new *I. sanguinea* cultivar ‘Donglin Shuying’ with a distinctive flower type and color. Compared with its parents, its flower type is flat, and the outer perianth and inner perianth are light purple with purple venation and spots.

Origin

The seeds of *I. sanguinea* and *I. sanguinea* f. *albiflora* were obtained from the Shenyang Botanical Garden of China and sown in

Mao-er Mountain Experimental Forest Nursery, Northeast Forestry University, Harbin, China, in Spring 2003. In Autumn 2011, seeds produced through crossing were collected from native *I. sanguinea* and *I. sanguinea* f. *albiflora* and planted in the same nursery in Spring 2012. Open-pollinated seeds were collected in Autumn 2014 and sown in the same nursery in Spring 2015. In 2017, a unique plant was observed among the progenies that differed in flower color and flower type from its parents. Its flower type was flat, and the outer perianth and inner perianth were light purple with purple venation and spots. In the following 3 years, the clones were established by ramet propagation in the same nursery, and the plants exhibited healthy growth. After 3 years of continuous field observations from 2019 to 2022, all plants showed stable and consistent morphological traits. In 2022, this new cultivar was named Donglin Shuying, which was officially authorized by the American Iris Society (accession no. 22-0584).

Description

From 2019 to 2022, ‘Donglin Shuying’, *I. sanguinea*, and *I. sanguinea* f. *albiflora* were planted in the experimental field in the nursery

of Northeast Forestry University in Harbin, China. Ninety plants of ‘Donglin Shuying’, *I. sanguinea*, and *I. sanguinea* f. *albiflora* were planted in a randomized complete block design with three replications of 30 plants each. Thirty plants were randomly selected from each genotype for data collection during the flowering period. Statistical analysis was conducted by two-way analysis of variance using IBM SPSS Statistics 26.0. All colors were recorded according to the Royal Horticultural Society (2007; RHS) Color Chart.

The morphological traits of ‘Donglin Shuying’, *I. sanguinea*, and *I. sanguinea* f. *albiflora* are presented in Table 1. The plant height of ‘Donglin Shuying’ (101.03 ± 1.84 cm) is significantly higher than those of its parents *I. sanguinea* (56.69 ± 0.95 cm) and *I. sanguinea* f. *albiflora* (57.28 ± 1.09 cm). ‘Donglin Shuying’ has longer and wider leaves than its two parents, however, the bract length and bract width of ‘Donglin Shuying’ are insignificantly different from that of both parents.

The flower diameter of ‘Donglin Shuying’ is 10.16 ± 0.49 cm, which is significantly larger than those of its parents. ‘Donglin Shuying’ has three inner perianths, outer perianths, stamens, and pistils, which are identical to those of the parents (Fig. 1A–C). The outer perianths (5.96 ± 0.11 cm in length; 4.32 ± 0.08 cm in width) and inner perianths (5.41 ± 0.08 cm in length; 2.56 ± 0.08 cm in width) of ‘Donglin Shuying’ are significantly longer and wider than those of both parents, but the inner and outer perianth length/width ratios (1.38 ± 0.03 and 2.12 ± 0.06) are less than those of both origins. The inner perianths of ‘Donglin Shuying’ are nearly horizontal when blooming, but its two parents have nearly upright inner perianths (Fig. 1D–F). The flower color of ‘Donglin Shuying’ is different from that of its parents. Its outer perianths and inner perianths are light purple (RHS 76D) with purple (RHS 75A) venation and spots (Fig. 1G). However, the inner and outer perianths of *I. sanguinea* and *I. sanguinea* f. *albiflora* are blue-violet (RHS N88A) and white (RHS N155C) (Fig. 1H and I). ‘Donglin Shuying’, *I. sanguinea*, and *I. sanguinea* f.

Table 1. Morphological traits of ‘Donglin Shuying’, *I. sanguinea*, and *I. sanguinea* f. *albiflora*.

Traits ⁱ	‘Donglin Shuying’	<i>I. sanguinea</i>	<i>I. sanguinea</i> f. <i>albiflora</i>
Plant height (cm)	101.03 ± 1.84 a ⁱⁱ	56.69 ± 0.95 b	57.28 ± 1.09 b
Leaf length (cm)	79.92 ± 1.38 a	57.98 ± 0.97 b	56.68 ± 0.96 c
Leaf width (cm)	1.62 ± 0.04 a	1.25 ± 0.02 b	1.22 ± 0.07 c
Leaf length/width	49.34 ± 0.92 a	46.34 ± 0.63 c	46.85 ± 1.13 b
Bract length (cm)	6.07 ± 0.18 b	6.31 ± 0.21 a	6.11 ± 0.06 b
Bract width (cm)	0.91 ± 0.07 b	1.00 ± 0.17 a	1.03 ± 0.07 a
Bract length/width	6.68 ± 0.51 a	6.43 ± 0.70 a	5.95 ± 0.39 b
Flower diameter (cm)	10.16 ± 0.49 a	6.68 ± 0.38 b	6.64 ± 0.23 b
Inner perianth length (cm)	5.41 ± 0.08 a	4.27 ± 0.13 c	4.52 ± 0.11 b
Inner perianth width (cm)	2.56 ± 0.08 a	1.39 ± 0.71 b	1.42 ± 0.12 b
Inner perianth length/width	2.12 ± 0.06 c	3.07 ± 0.16 b	3.20 ± 0.27 a
Outer perianth length (cm)	5.96 ± 0.11a	4.79 ± 0.10 c	4.86 ± 0.14 b
Outer perianth width (cm)	4.32 ± 0.08 a	1.67 ± 0.13 c	2.31 ± 0.12 b
Outer perianth length/width	1.38 ± 0.03 c	2.89 ± 0.22 a	2.11 ± 0.10 b
Flower period	5 Jun–25 Jun	5 Jun–25 Jun	5 Jun–25 Jun
Fruit period	10 Aug–20 Sep	10 Aug–20 Sep	10 Aug–20 Sep

ⁱ Data were collected in 2019–22 and analyzed using SPSS 26.0 (Lenovo, Beijing, China).

ⁱⁱ Means followed by different letters in the same row are significantly different ($P < 0.05$).

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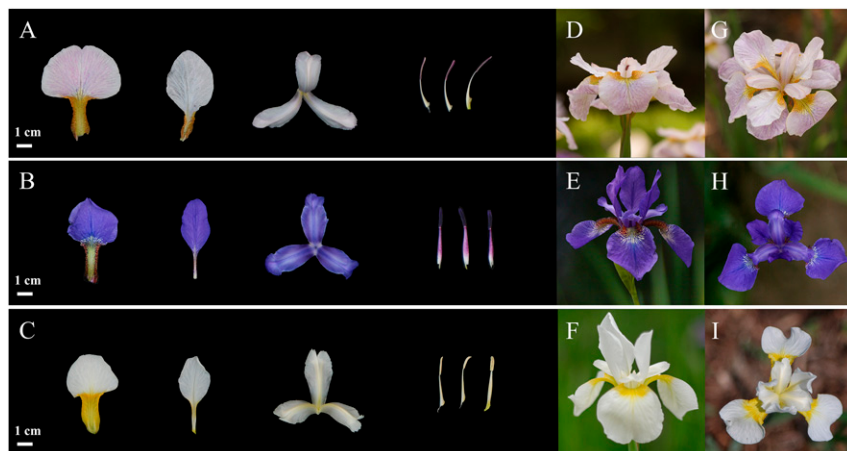


Fig. 1. Flower anatomy of ‘Donglin Shuying’ (A), *I. sanguinea* (B), and *I. sanguinea* f. *albiflora* (C), showing their outer perianths, inner perianths, style arms, and stamens. Representative flowers of ‘Donglin Shuying’ (D and G), *I. sanguinea* (E and H) and *I. sanguinea* f. *albiflora* (F and I).

albiflora all exhibit light yellow (RHS 8B) at the base of the inner perianths and outer perianths (Fig. 1A–C). The style arms of ‘Donglin Shuying’ are light purple (RHS 76D), whereas *I. sanguinea* and *I. sanguinea* f. *albiflora* are blue-violet (RHS N88A) and white (RHS N155C), respectively (Fig. 1A–C). The anther of ‘Donglin Shuying’ is violet (RHS N78B), compared with the violet-blue (RHS N92C) anthers of *I. sanguinea* and yellow (RHS 15A) color of *I. sanguinea* f. *albiflora* (Fig. 1A–C). There is no fragrance when ‘Donglin Shuying’ and its parents bloomed. The flower and fruit periods of ‘Donglin Shuying’ are similar to those of both parents, with flowering times from 5 Jun to 25 Jun and fruiting times from 10 Aug to 20 Sep.

In conclusion, the major differences between ‘Donglin Shuying’ and its parents are plant height, leaf length, flower diameter, flower type, and flower color. ‘Donglin

Shuying’ has a higher plant height and leaf length, and its flower is larger and more special in flower type and color.

Cultivation Techniques

‘Donglin Shuying’ has strong cold resistance and can spend the winter outdoors in Harbin, China. It is suitable for growing in northern China or areas with similar climates. ‘Donglin Shuying’ does not have strict requirements on soil, but it is better to use sandy loam or light clay with good permeability and rich humus. It can be propagated asexually via division in spring, summer, or early autumn. Water was thoroughly applied before planting, and the soil was kept moist after planting. Generally, fertilization is not needed, and pests and diseases rarely occur.

Landscape Applications

‘Donglin Shuying’ has large flowers and long stems, which can be used as cut flowers. With strong resistance and extensive management, it can be planted in wet grassland, waterside wetland, and sunny land for urban landscaping and ecological restoration.

Availability

Inquiries about research or request for ‘Donglin Shuying’ plant materials can be made to Dr. Ling Wang (E-mail: wanglinghlj@126.com) at the College of Landscape Architecture, Northeast Forestry University, Harbin, China.

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