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‘Donglin Ziyun’: A New Iris Sanguinea Cultivar

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Iris sanguinea is a perennial herbaceous plant in the Iridaceae family. Its flowers are blue, the flowering period is from May to June, and the fruiting period is from July to September. The plant’s leaves and flowers are very visually attractive. In recent years, numerous cultivars of *I. sanguinea* have been developed, exhibiting unique floral patterns with different colors and shapes. For instance, the Qihuan Zi cultivar exhibits a purple flower with a blue-purple center and light purple petals (Fan et al. 2022). The outer perianth of the Yise Ziqun cultivar is nearly circular and exhibits a pendulous posture during full bloom, with a wedge-shaped base. The perianths exhibit a distinct claw-like pattern at their base (Xu et al. 2024). The Zi Meiren cultivar exhibits purple flowers with dark purple and violet spots and stripes, and the edges of the perianths turn to lilac (Chen et al. 2019). The Dream of the Butterfly cultivar exhibits delicate pale purple blossoms characterized by an expansively broad outer perianth, lending the flower an elegant, butterfly-like appearance (Zhao et al. 2018). The Xiao Feidie cultivar exhibits white flowers with a flat, spoon-like outer perianth (Liu et al. 2023).

We developed a new cultivar, Donglin Ziyun, via a cross between *I. sanguine* and *I. sanguinea* f. *albiflora*. The flower exhibits a bicolor pattern that is vibrant and vivid. In addition, the color of the edges and the center of the outer perianths, as well as the color difference between the outer and inner perianths, varies. The outer perianths exhibit deep pinkish purple edges (Royal Horticultural Society [RHS] N81A) and a purple center (RHS N87A), whereas the inner perianths exhibit deep pinkish purple (RHS N81B). The morphology of the outer perianths is semidrooping, and the inner ones are semiupright. The style branches are a deep pinkish purple (RHS N81B).

Origin

In 2003, seeds of *I. sanguine* and *I. sanguinea* f. *albiflora* from Shenyang Botanical Garden were introduced and sown in the horticultural nursery of Northeast Forestry University’s Maoershan Experimental Forest in the spring. The seeds were collected in the fall of 2011 from a cross between an *I. sanguine* female parent and an *I. sanguinea* f. *albiflora* male parent. Seeds from open pollination were collected in the fall of 2014 and sown in the same seed nursery during the spring of 2015.

In 2017, an exceptional individual plant was identified among the open-pollinated offspring that exhibited unique flower colors. The plant exhibited vivid and bright bicolor flowers with the outer perianths transitioning from deep pinkish purple to purple in a semidrooping fashion, while the inner perianths were semierect and also deep pinkish purple, the style branches were a deep pinkish purple. From 2020 to 2023, after 4 years of continuous field observations and vegetative reproduction, it was determined that these plants exhibited outstanding growth and stable excellent traits, such as flower color. As a result, it was officially named ‘Donglin Ziyun’ and then registered in the American Iris Association in 2023 with the registration number of DBLYDX-DLZY-2018-42.

Description

A total of 90 plants of ‘Donglin Ziyun’ and its parents were planted in the horticultural nursery experimental field of Northeast Forestry University in Harbin, China, from 2020 to 2023. A randomized block design was used, with 10 plants per variety in each of three blocks (replications) to document the morphological characteristics of the parents and offspring. Flower colors were recorded according to the RHS Color Chart (Royal Horticultural Society 2007). Statistical analysis was conducted using one-way analysis of variance with IBM SPSS Statistics 26.0 (Armonk, NY, USA) (Table 1).

The outer perianth of ‘Donglin Ziyun’ is nearly round and sloping down at a nearly 45° angle when blooming (Fig. 1B). This differs from its parents, which exhibit a transversely elliptical shape and assume a drooping posture during full bloom (Fig. 1E and H). The ‘Donglin Ziyun’ inner perianth is oval with nearly white midvein lines and slant at an upward angel of nearly 45° (Fig. 1B), whereas the inner perianth of its parents are obovate and grow vertically during full bloom (Fig. 1E and H).

‘Donglin Ziyun’ flower color is significantly different from that of its parents, with dark pinkish purple (RHS N81A) and purple (RHS N87A) gradients on the outer perianth, while the wedges on the Java have blackish-brown netting and yellow-green markings. The inner perianth is dark pinkish purple (RHS N81B), the midvein has nearly white lines, and the Java bars have dark brown reticulation and yellow markings. However, the inner and outer perianth segments of *I. sanguinea* and *I. sanguinea* f. *albiflora* are bluish purple (RHS N88A) and white (RHS N155C) (Fig. 1C, F, and I). The style arms of ‘Donglin Ziyun’ are dark pinkish purple (RHS N81B), whereas those of *I. sanguinea* and *I. sanguinea* f. *albiflora* are bluish purple (RHS N88A) and white (RHS N155C), respectively (Fig. 1A, D, and G). The anthers of ‘Donglin Ziyun’ are light purple (RHS 77A), whereas those of *I. sanguinea* are purplish blue (RHS N92C) and those of *I. sanguinea* f. *albiflora* are yellow (RHS 15A) (Fig. 1A, D, and G). The morphological characters of ‘Donglin Ziyun’, *I. sanguinea,* and *I. sanguinea* f. *albiflora* are shown in Table 1. The plant

Table 1. The morphological characteristics of ‘Donglin Ziyun’ and its parents *I. sanguinea* and *I. sanguinea* f. *albiflora*.

Traits[i]	‘Donglin Ziyun’	*I. sanguinea*	*I. sanguinea* f. *albiflora*
Plant height (cm)	57.86 ± 1.97 a	58.49 ± 0.28 a	59.05 ± 0.61 a
Leaf length (cm)	53.87 ± 1.37 b	58.57 ± 0.41 a	57.96 ± 0.21 a
Leaf width (cm)	1.14 ± 0.03 b	1.25 ± 0.02 a	1.08 ± 0.04 c
Leaf length/width (cm)	47.40 ± 0.84 b	46.98 ± 0.51 b	53.88 ± 1.67 a
Bract length (cm)	7.18 ± 0.06 a	6.25 ± 0.02 b	6.15 ± 0.06 b
Bract width (cm)	0.92 ± 0.03 b	1.03 ± 0.02 a	1.01 ± 0.03 a
Bract length/width (cm)	7.84 ± 0.33 a	6.06 ± 0.13 b	6.09 ± 0.14 b
Flower diameter (cm)	10.58 ± 0.41 a	6.27 ± 0.43 b	6.47 ± 0.51 b
Inner perianth length (cm)	6.30 ± 0.25 a	4.74 ± 0.07 b	4.61 ± 0.02 b
Inner perianth width (cm)	2.62 ± 0.06 a	1.62 ± 0.03 b	1.45 ± 0.15 c
Inner perianth length/width (cm)	2.41 ± 0.15 c	2.93 ± 0.10 b	3.18 ± 0.03 a
Outer perianth length (cm)	6.52 ± 0.08 a	4.83 ± 0.02 b	4.86 ± 0.01 b
Outer perianth width (cm)	4.49 ± 0.23 a	2.16 ± 0.04 b	2.38 ± 0.03 b
Outer perianth length/width (cm)	1.45 ± 0.09 c	2.23 ± 0.04 a	2.04 ± 0.02 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 2020–22 and analyzed using IBM SPSS Statistics 26.0 with a one-way analysis of variance. Different letters in the same row denote significant differences ($P < 0.05$).

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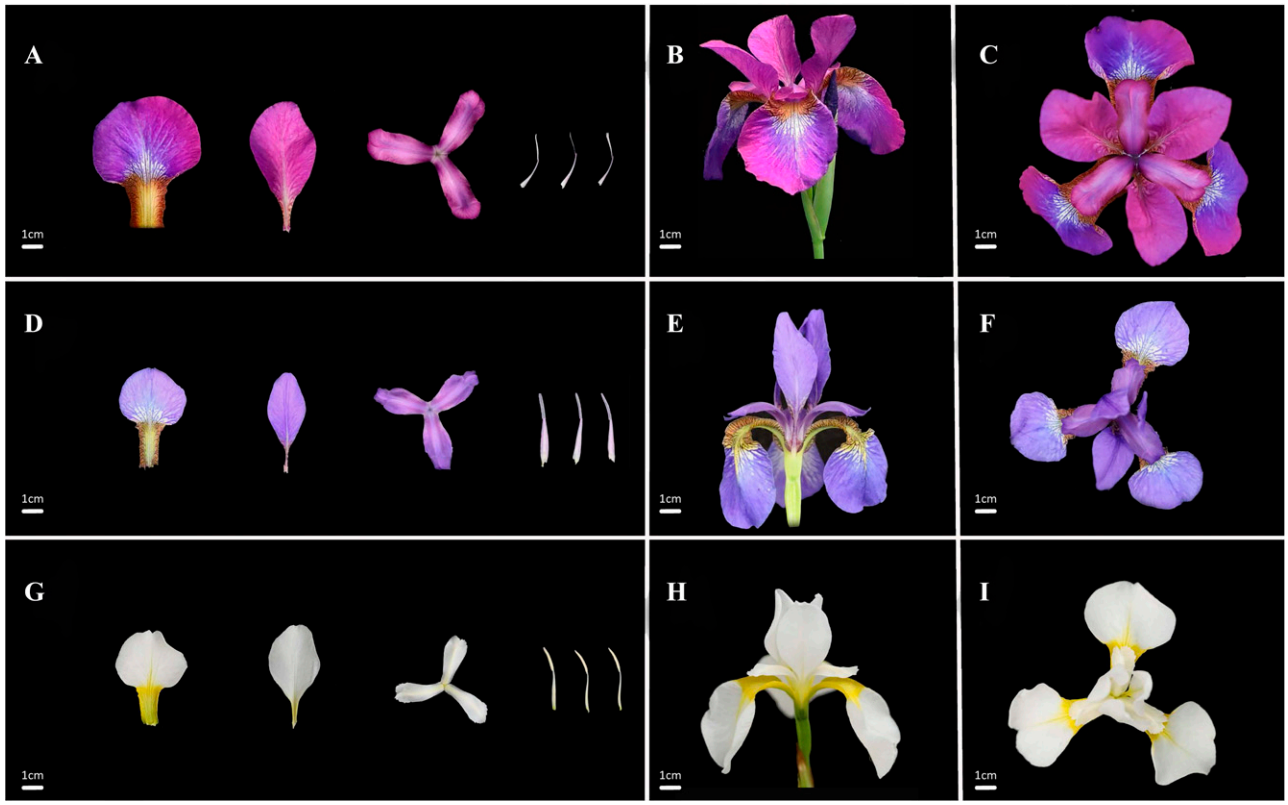

Fig. 1. Anatomical structures of 'Donglin Ziyun' and its parents *I. sanguinea* and *I. sanguinea* f. *albiflora.* Flower anatomy of (**A**) 'Donglin Ziyun', (**D**) *I. sanguine*, and (**G**) *I. sanguinea* f. *albiflora*, showing their flower anatomical structures. Flower anatomical structures (from left to right) include outer perianth segment, inner perianth segment, style branches, and stamens. Representative flowers of (**B** and **C**) 'Donglin Ziyun', (**E** and **F**) *I. sanguine,* and (**H** and **I**) *I. sanguinea* f. *albiflora*.

height of 'Donglin Ziyun' (57.86 ± 1.97 cm) is not significantly different from that of its parents, *I. sanguinea* (58.49 ± 0.28 cm) and *I. sanguinea* f. *albiflora* (59.05 ± 0.61 cm). The flower diameter of 'Donglin Ziyun' is significantly larger (10.58 ± 0.41 cm) than that of its parents, *I. sanguinea* (6.27 ± 0.43 cm) and *I. sanguinea* f. *albiflora* (6.47 ± 0.51 cm). The outer perianth of 'Donglin Ziyun' (6.52 ± 0.08 cm in length; 4.49 ± 0.23 cm in width) and the inner perianth (6.30 ± 0.25 cm in length; 2.62 ± 0.06 cm in width) are larger than those of its parents: the outer perianth of *I. sanguinea* (4.83 ± 0.02 cm in length; 2.16 ± 0.04 cm in width) and the inner perianth (4.74 ± 0.07 cm in length; 1.62 ± 0.03 cm in width), the outer perianth of *I. sanguinea* f. *albiflora* (4.86 ± 0.01 cm in length; 2.38 ± 0.03 cm in width) and the inner perianth (4.61 ± 0.02 cm in length; 1.45 ± 0.15 cm in width). Neither 'Donglin Ziyun' nor its parents produce any fragrance when blooming. The flowering period of 'Donglin Ziyun', from 5 Jun to 25 Jun, and the fruiting period, from 10 Aug to 20 Sep, are consistent with those of its parental line.

Compared with its parents, 'Donglin Ziyun' exhibited significantly larger flowers, displaying a unique style: bicoloration of deep pinkish purple and purple—a distinctive characteristic absent in its parents. In addition, 'Donglin Ziyun' can be used in cut flower production, thus enhancing its commercial value.

Cultivation Techniques

'Donglin Ziyun' can be divided and propagated in spring, summer, and early autumn. When dividing, ensure that three to four rhizomes are grouped together in each cluster. A planting spacing of 40 cm × 40 cm is appropriate. Following planting, thoroughly water the plants and maintain a moist soil. During dry seasons, ensure that the plants are well watered, at least every 10 d. For large-scale reproduction, the plants can be grown in large open fields.

Habit and Application

'Donglin Ziyun' has excellent cold tolerance and disease resistance, and can be propagated and used in landscaping in northern China. The flowers and leaves have excellent ornamental qualities and can be used in large landscape plantings, border plantings, as an herbaceous border ornamental, and in cut flower arrangements.

Availability

Inquiries about research or requests for 'Donglin Ziyun' plant materials can be made to Dr. Lijuan Fan (E-mail: flj@nefu.edu.cn) at the College of Landscape Architecture, Northeast Forestry University, Harbin, China.

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