

Hanxu: A New *Iris sanguinea* Cultivar

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The genus *Iris* belongs to the *Iridaceae* family, which is well known throughout the world for its diverse color and unique flower shape. In China, *Iris sanguinea*, one species of *Iris*, is a typical cold-region ornamental species. It is a perennial herb with a wide distribution in the Heilongjiang, Liaoning, and Jilin provinces of northeast China (Zhao et al., 2000). It is a valuable ornamental landscape plant because of its large, showy flower with a distinctive flower pattern. It is also drought tolerant and resistant to pollution. It exhibits rapid propagation, strong resistance to diseases and pests, and produces an outstanding flower suitable for cut-flower production. To date, there are ≈60,000 *Iris* cultivars worldwide (Luo et al., 2016). Recently, *I. sanguinea* breeders have developed and released new cultivars with new color variations. Primarily, these recently released cultivars involved new flower colors. These new cultivars include ‘Zidie’ with a purple flower (C60 M90) (Dong et al., 2014), ‘Beautiful Lotus’ with a pinkish purple violet flower (NCS S3030-R60B) (Wang et al., 2016), and ‘Forest Fairy’ with a light violet (RHS 85C) flower (Kuwantai et al., 2018). These new cultivars were selected and released for their flower color rather than a new and unique change in the structure of the flower or plant. In 2012, a new *I. sanguinea* cultivar, Hanxu, was identified as having a unique plant and flower structure.

Origin

The new *I. sanguinea* cultivar Hanxu was selected from an open-pollinated progeny population of *I. sanguinea* at the Mao-Er-Shan experimental nursery of Northeast Forestry University, Harbin, China. The seeds of *I. sanguinea* were collected from Shenyang Botanical Garden in 2003. Open-pollinated seeds were harvested in Fall 2009 and planted in Spring 2010. In 2012, a unique progeny (NEFU 2012-7) was observed in the mixed population. The cultivar is unique with respect to flower and plant structure with two

flowers on top of a single scape that is wrapped by one bract. Further, although all scapes are tall with a similar height, the scapes are slightly lower than the cultivar’s erect leaves. The tillers of this plant were vegetatively propagated and planted in a new research plot. The plant’s field performance was observed from 2015 to 2017, and data were collected for statistical analysis. The morphological traits of all the propagated plants were stable and consistent. In 2017, this cultivar was named Hanxu (Chinese for “veiled”) and officially authorized by the American Iris Society with an accession No.17-0987.

Description

The new cultivar Hanxu and the original *I. sanguinea* were planted and randomly arranged in a field experiment with three replications in a nursery of Northeast Forestry University, Harbin, China. A total of 30 plants (10 plants per replication) were randomly selected for data collection. The following morphological traits were collected from 2015 to 2017 during the flowering period: plant height, leaf length, scape length,

leaf length/scape length, flower diameter, inner perianth length, inner perianth width, inner perianth length/width, outer perianth length, outer perianth width, outer perianth length/width, and flower period. All colors were based on the Royal Horticultural Society (2007) Color Chart and designated as RHS numbers. The data were analyzed using SPSS 22.0 software (IBM, Armonk, New York, NY) with Student’s *t* test.

The characteristics and traits of *I. sanguinea* ‘Hanxu’ and *I. sanguinea* are presented in Tables 1 and 2. ‘Hanxu’ has a compact, moderately tight, erect plant structure, compared with the less compact, looser, and moderately erect plant structure of *I. sanguinea* (Fig. 1). ‘Hanxu’ leaves are erect with relatively uniform plant height up to 92 cm. ‘Hanxu’ plant height is equivalent to its leaf length. The flowers are located below the upper level of the leaves and “hidden” in the vertical leaf foliage. ‘Hanxu’ plant structure is easily differentiated from the original *I. sanguinea* (Fig. 1). The native *I. sanguinea* leaves are shorter (56 cm) and less erect than those of the new cultivar (92 cm). The native *I. sanguinea* also has shorter scapes (74 cm) than ‘Hanxu’ (79 cm). The anther color of ‘Hanxu’ is pure light blue violet (RHS 93B), in contrast to the blue violet color (RHS N92C) of *I. sanguinea*. During flowering, ‘Hanxu’ produces two flowers within a single bract. The inner perianths of ‘Hanxu’ and *I. sanguinea* are erect. The length and width of ‘Hanxu’s’ inner perianths are 4.6 and 2.7 cm, respectively, compared with *I. sanguinea*’s 4.4 and 1.4 cm. The outer perianths of the flowers

Table 1. A comparison of the plant morphology of *Iris sanguinea* ‘Hanxu’ and wild *I. sanguinea*.

Descriptor	<i>I. sanguinea</i> ‘Hanxu’	<i>I. sanguinea</i>
Plant type	Erect	Less erect/drooping
Leaf	Erect	Erect/pendulous
Scape	Lower than the leaves	Higher than the leaves
Flower color ^z	RHS 93B	RHS N92C
Flower form	Compact	Incompact
Flower number	2 in one bract	1–2 in one bract
Blossoming time	Overlapping	Continuous
Inner perianth	Erect	Erect
Outer perianth	Slightly drooping	Completely drooping

^zColor determination is based on comparison with RHS Color Chart.

Table 2. Comparisons of *Iris sanguinea* ‘Hanxu’ plant characteristics and wild *I. sanguinea* grown in the field during flowering period from 2015 to 2017 in Harbin, China.

Traits	<i>I. sanguinea</i> ‘Hanxu’	<i>I. sanguinea</i>
Plant height (cm)	92.04 ± 0.57 a ^z	63.22 ± 0.60 b
Leaf length (cm)	92.04 ± 0.57 a	55.72 ± 0.33 b
Scape length (cm)	79.30 ± 0.62 a	74.10 ± 0.35 b
Leaf/scape length	1.16 ± 0.01 a	0.75 ± 0.01 b
Flower diameter (cm)	9.46 ± 0.05 a	6.40 ± 0.04 b
Inner perianth length (cm)	4.64 ± 0.04 a	4.38 ± 0.05 a
Inner perianth width (cm)	2.67 ± 0.04 a	1.39 ± 0.02 b
Inner perianth length/width	1.75 ± 0.03 b	3.17 ± 0.04 a
Outer perianth length (cm)	5.67 ± 0.05 a	5.56 ± 0.05 b
Outer perianth width (cm)	4.28 ± 0.03 a	2.46 ± 0.04 b
Outer perianth length/width	1.33 ± 0.01 b	2.28 ± 0.02 a
Flower period	2 June to 28 June	5 June to 25 June

^zDifferent letters indicate significant differences among the treatments according to Student’s *t* test (*P* < 0.05).

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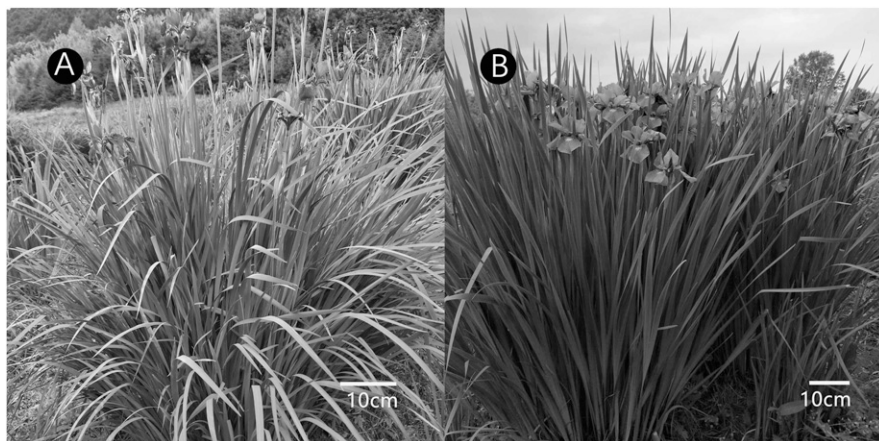


Fig. 1. Comparisons of plants of wild *I. sanguinea* (A) and cultivar *I. sanguinea* 'Hanxu' (B). 'Hanxu' is erect with flowers beneath the leaves, compared with *I. sanguinea*.

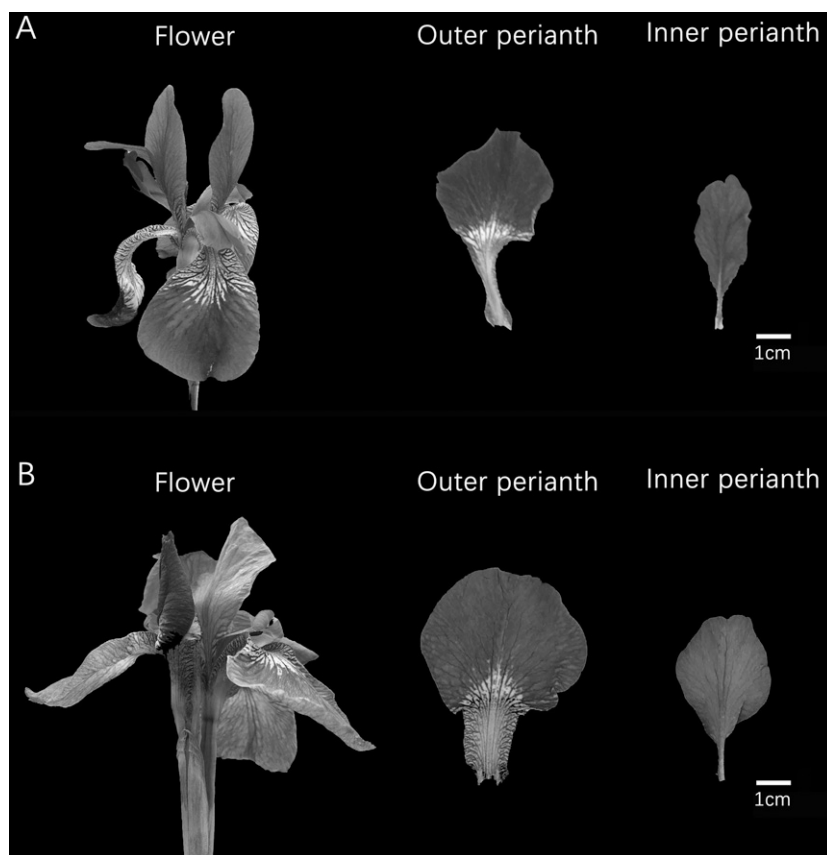


Fig. 2. Comparisons of flower and perianths of wild *I. sanguinea* (A) and cultivar *I. sanguinea* 'Hanxu' (B). 'Hanxu' has larger flowers and perianths with a violet blue color.

are different; 'Hanxu' is 5.7 cm in length and slightly drooping, whereas, *I. sanguinea* is 5.6 cm in length and completely drooping.

The outer perianths width of 'Hanxu' (4.3 cm) are 1.7 times larger than that of *I. sanguinea* (2.5 cm). The flower diameter

of 'Hanxu' is 9.5 cm, which is significantly larger than that of *I. sanguinea* (6.4 cm) (Fig. 2). 'Hanxu' flowers blossom from June 2 to June 28, 1 week longer than *I. sanguinea* (June 5 to June 25) (Table 2).

In summary, *I. sanguinea* 'Hanxu' has an erect compact plant structure with larger violet-blue (RHS 93B) flowers that are located lower than its erect leaves and a longer flowering period than the native *I. sanguinea*.

Cultivation Techniques

'Hanxu' is suitable for growing in moist soils under abundant sunshine. It is recommended that division propagation should be conducted in the spring, summer, and/or early fall using the ramets. Individual plants should be planted 30 cm apart in the field under regular irrigation followed by weed control to assist in the proper establishment of the new plants.

Recommendation

I. sanguinea 'Hanxu' is an ideal compact flowering plant for garden landscapes. Its flowers and leaves are also suitable for flower arrangements.

Availability

Information about plant material and research of 'Hanxu' can be obtained from Dr. Ling Wang (wanglinghj@126.com) at the College of Landscape Architecture, Northeast Forestry University, Harbin, China.

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