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# ‘Xi Zi Hong Zhuang’: A New Ornamental *Lycoris rosea* Cultivar

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*Lycoris* Herb., a perennial bulbous flower belonging to the Amaryllidaceae family, is distributed extensively in East, Central China, as well as in Asian regions such as Japan and South Korea (Ji and Meerow 2000). As a result of its diverse flower colors, graceful leaf arrangement, strong adaptability, and multifunctional values in terms of ornamental, medicinal, and ecological significance, *Lycoris* is used for ecological enhancement, urban landscaping, and agricultural purposes (Zhao et al. 2024).

*Lycoris* plants offer a diverse array of flower shapes and colors on upright scapes (Luo et al. 2009). They serve dual purposes as garden groundcover and cut flower materials (Wang et al. 2008). *Lycoris* plants have a strong adaptability to environmental changes and a low maintenance cost. In Japan, the United States, and European countries, the commercial production of *Lycoris* cut flowers has been well-established for a long time (Lin and Lee 1993; Zhao et al. 2022). Notably, certain varieties have also been cultivated and sold in small quantities in China, including Yunnan, Shanghai, Nanjing, Hangzhou, and Taiwan (Yu et al. 2006; Zhao et al. 2021), and they are gradually gaining popularity in the market. Since 2009, the joint research team of Zhejiang University and Zhejiang Sci-Tech University has conducted extensive research on the occurrence and development of bulblets and germplasm innovation in *Lycoris* (Chang et al. 2013; Ren et al. 2017, 2021, 2022). The ongoing research focuses on cultivating new varieties of *Lycoris* with excellent ornamental characteristics and bulblet proliferation advantages. Some of these varieties have been registered and released on the Koninklijke Algemeene Vereeniging voor Bloembollencultuur (KAVB) website (https://www.kavb.nl/kennisbanken/kavbpublicaties) in 2020 and 2024. ‘Xi Zi Hong Zhuang’ is a variety of *Lycoris rosea* with pure flower color, upright scape, a large number of florets, and consistent blooming time, which is ideal for fresh cut flowers and garden groundcover flowers.

## Origin and Development

Breeding of *Lycoris* began in the 1950s and 1960s. *Lycoris* plants are characterized by rich germplasm resources, easy interspecific hybridization, and diverse trait variations. Therefore, they have advantages in early variety selection from wild resources (Li 2010). For example, the American botanist Traub, after years of research, selected and published 10 kinds of species, such as *Lycoris rosea* and *L. haywardii* (Yuan and Hu 2009). Nowadays, in terms of breeding, researchers worldwide are committed to prolonging the flowering period, increasing flower colors, enriching flower forms, and expanding the variety types (Chen 2016). Many new *Lycoris* varieties with superior ornamental characteristics, such as ‘Chen Xia’ and ‘Jin Ling Ban Cheng,’ have been recently introduced. In 2014, our team selected ‘Xi Zi Hong Zhuang’ from the natural population of *L. rosea*. Asexual descendants of this variety were established through artificial cuttings and planted in the same experimental area for up to 6 years. During 2020 to 2024, all the asexually propagated bulbs showed uniform and enduring phenotypic traits, including distinctly curled rose-colored tepals, turquoise scapes, a high floret count, robust scape posture, and well-clustered blossoms. In 2024, the KAVB approved the release of this new variety of *Lycoris* under the name ‘Xi Zi Hong Zhuang’ (EDI bulb code: 601141, 2024) (https://www.kavb.nl/detail?cid=41748).

## Description

The new variety ‘Xi Zi Hong Zhuang’ is a variant of *L. rosea.* Its bulb is elliptical, with a brown epidermis. The diameter of bulbs ranges from 2.4 to 3.6 cm, the height is ~4 cm, and the number of scale layers is between 10 and 13. This cultivar exhibits an autumn leaf-out pattern, blooming in early September and leafing out in late October, with its aboveground components remaining visible for 7 months. Throughout the leaf expansion phase, the leaf blade is strap-shaped, featuring a dark-green surface [yellow-green, Royal Horticultural Society (RHS) 147A] (Royal Horticultural Society 2007) and a prominent midrib on the underside. The leathery leaf blade consists of six to seven leaves, measuring ~32.2 cm long and 0.9 cm wide. It stands erect, contributing to a plant height of 34.88 ± 6.93 cm during the leaf expansion phase, rendering it an excellent evergreen groundcover in winter.

During peak bloom, the aboveground portion of the plant grows to a height of 55.73 ± 3.31 cm, with a flower scape measuring 40.33 ± 2.08 cm in length. The central part of the scape has a diameter of ~0.7 cm, displaying superior erectness compared with *L. rosea*. ‘Xi Zi Hong Zhuang’ has an umbel of six to eight florets distributed uniformly in a globular shape, with an inflorescence diameter of 19.20 ± 1.25 cm. The average diameter of each floret is 8.0 cm. The corolla tube measures 0.53 ± 0.96 cm in length, whereas the pedicel is 2.46 ± 0.31 cm long. Each floret exhibits six perianth segments, arranged symmetrically, with dimensions of 5.15 ± 0.42 cm in length and 0.76 ± 0.89 cm in width. The stamens and pistils extend beyond the tepals, displaying a deep red color (red-purple, RHS 64C), with the stamens measuring

Fig. 1. The flowers of *Lycoris rosea* (**left**) and ‘Xi Zi Hong Zhuang’ (**right**).

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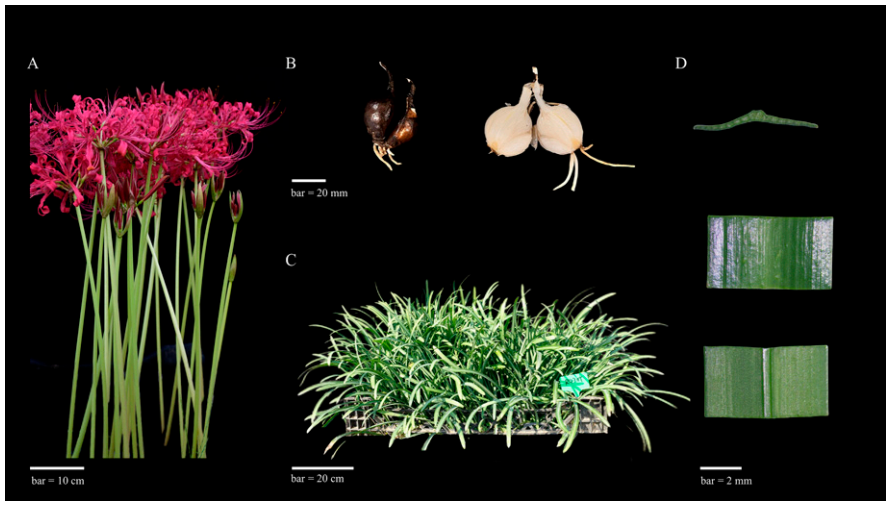


Fig. 2. Morphological observations of the new cultivar Xi Zi Hong Zhuang. (**A**) Florescence. (**B**) Bulbs. (**C**) Green-leaf stage. (**D**) Cross-sectional observation of leaves.

7.14 ± 0.61 cm and the pistils 8.37 ± 0.70 cm in length (Supplemental Table 1).

Characteristically, compared with *L. rosea*, the diameter of the umbel inflorescence of a single plant of the new variety 'Xi Zi Hong Zhuang' has increased significantly, and the florets are arranged more compactly with a significant increase in quantity. The tepals of the new cultivar are overall rose-colored (red-purple, RHS 64C), and have the characteristics of strongly recurved tips and moderately wrinkled edges (Fig. 1), which is unlike the original species of *L. rosea*, with dark-blue perianth segment tips (violet-blue, RHS 98A) that are slightly recurved and have slightly wrinkled edges (Fig. 1). During testing, we observed that the color, plant height, and blooming time of 'Xi Zi Hong Zhuang' showed a high degree of consistency, resulting in a striking ornamental display when cultivated. In addition, individual plant florets consistently bloomed simultaneously, with sturdy upright scapes that resisted drooping, making them particularly advantageous for use as fresh cut flowers (Fig. 2).

## Propagation, Cultivation, and Application

The new cultivar Xi Zi Hong Zhuang thrives in conditions of full sunlight, loose soil, and a deep soil layer (Zhang et al. 2015). Under natural conditions, 'Xi Zi Hong Zhuang' is not fertile and is propagated mainly by dividing the bulbs. However, the reproduction rate is relatively low, and it takes 3 to 4 years for the divided juvenile bulbs to grow into mature bulbs (Ren 2019). Therefore, it is preferable to use artificial cuttings via the basal plate (Lv et al. 2005). The best time to take *Lycoris* bulb cuttings is during the leafless period in summer. Initially, the healthy bulbs of 'Xi Zi Hong Zhuang' are dug out, and the decayed roots and remnants of the brown outer skin are removed to expose the bulbs. Subsequently, the substrate of the bulbs is cut, sterilized, and, after being shade-dried, is inserted into a moist substrate. After 3 months, adventitious buds become apparent at the junction between the scales and the basal plate, with a proliferation rate markedly surpassing that of naturally divided *Lycoris* bulbs. This asexual propagation is not only conducive to shortening the breeding cycle of bulblets, but also is conducive to maintaining the stability of ornamental traits of new varieties. Furthermore, scales, leaves, floral organs, seed embryos, and so forth, can also be selected as explants for tissue culture to enhance bulb proliferation rates. However, special attention should be paid to the disinfection process to minimize contamination rates of the primary culture (Ren et al. 2021).

In summary, the distinguishing characteristics of 'Xi Zi Hong Zhuang' are as follows. First, during flowering, the florets in the umbel inflorescence open neatly, and are arranged compactly and plumply, with pure flower colors. The flower scapes are robust and the flower stalks are of an appropriate length, making it an ideal material for fresh cut flowers. Second, leaves emerge in October after flowering, exhibiting rapid growth rates. The aboveground foliage displays lush development, potentially remaining evergreen through winter before withering by April of the following year. This cycle offers aesthetic appeal throughout three seasons, underscoring the ornamental and commercial promise of this new cultivar. It is expected to become a popular cultivar in the future and is worthy of being vigorously promoted.

## Availability

The cultivar Xi Zi Hong Zhuang was registered with the KAVB in 2024. It is available through Zhejiang Sci-Tech University. Contact Ziming Ren (e-mail: zimingren@zju.edu.cn) for inquiries.

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