

# ‘Yanricai’: A New Cultivar of *Rhododendron dauricum* L. with Dense Flowers

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*Rhododendron dauricum* L. is a semievergreen plant, and grows in *Larix gmelinii* (Rupr.) Kuzen. or *Betula platyphylla* Suk. forests in northeastern China. Its purple flowers open in early spring, giving *R. dauricum* high ornamental values. However, the wild type often displays sparse flowers, which limits its garden application. Here, we released a new *R. dauricum* cultivar, designed as Yanricai, which has dense purple flowers and is valuable to floriculture and garden. A variant branch was collected from a wild plant of *R. dauricum* and propagated using the tissue cultural method. Clones showed dense flowers with flamboyant color. *R. dauricum* ‘Yanricai’ was registered with the Royal Horticultural Society (RHS) of the International Cultivar Registration Authorities in Jul 2022.

*R. dauricum* is a dominant species growing in the Great Khingan Mountains of northeastern China (Lu et al. 2022). The annual average temperature there is  $-2.8^{\circ}\text{C}$ , and the extreme minimum temperature is  $-52.3^{\circ}\text{C}$  (Zhou et al. 2003). *R. dauricum* shows strong cold resistance and has important ecological value in the forest system (Sun and Hu 2010). Traditionally, the leaves of *R. dauricum* were used as herbal medicine (Chae et al. 2021) to treat cough and asthma, the effect of which could be attributed to farrerol in the dried leaves (Sun and Hu 2010). Recently, there is an increasing interest in using *R. dauricum* as

an ornamental plant in parks or gardens (Yu et al. 2009).

However, *R. dauricum* has limited application by gardeners because of its sparse flowers and sole flower color. Recently, a new *R. dauricum* cultivar, Ao Xue, was released, which shows white flowers (Wang et al. 2022). ‘Ao Xue’ enriches the colors of *R. dauricum*. Yanricai is another cultivar of *R. dauricum* that presents dense flowers (8–14 per inflorescence) and flamboyant flower color. This new cultivar has potential ornamental value of *R. dauricum* in gardens and parks.

## Origin

A unique branch with spherical inflorescence from a wild *R. dauricum* plant was found in the flowering season of 2014 in Mordoga Forestry Bureau of Inner Mongolia Autonomous Region ( $120^{\circ}52'40''\text{E}$ ,  $52^{\circ}7'48''\text{N}$ ), China. In July, young stems from the dense flower branch were obtained for tissue culture propagation. The same method was also used for the reproduction of *R. dauricum*. In 2015, all vegetatively

propagated plants were transplanted to a greenhouse in the Heilongjiang Forestry Institute, and then moved to the field in May 2016. All plants started flowering in 2018. Field trials were performed from 2019 to 2021, the major morphological traits of all plants were stable and consistent. ‘Yanricai’ was officially registered with the RHS on 4 Jul 2022.

## Description

Both ‘Yanricai’ and *R. dauricum* were arranged in a nursery block using a randomized complete block design with three replicates, 20 plants in each block with  $1\text{ m} \times 1\text{ m}$  apart in a row. A total of 30 plants (10 plants per replicate) were selected for further evaluation from 2019 to 2021 during the flowering period. The leaf and flower colors were measured using the RHS Color Chart (Royal Horticultural Society 2015). The data were analyzed using SPSS 22.0 software with the Student’s *t* test.

The height of ‘Yanricai’ averaged  $101.23 \pm 0.22\text{ cm}$ , which was significantly higher than that of *R. dauricum* ( $87.56 \pm 0.06\text{ cm}$ ) at 7 years. ‘Yanricai’ shows a rapid growth trend, and the length of the new stems is significantly longer than that of *R. dauricum* (Table 1).

The leaves of ‘Yanricai’ are leathery and elliptic with a length-width ratio of 2 to 3:1 (Table 1). Leaf tip is slightly concave, and the base is round. The leaf margin is entire, and the petiole is cylindrical. The color of young leaves is green (RHS 141A). When the terminal bud stopped growth in autumn, the leaf color gradually changed to gray-purple (RHS 185A). Most leaves fall in early October, only a few leaves remained. Compared with *R. dauricum*, there was no significant difference in leaf characteristics. Corolla diameter and flower shape of the ‘Yanricai’ plants are not significantly different from *R. dauricum*. However, the corolla lobes show apparent undulating margin, compared with the weak undulating margin in *R. dauricum* (Table 1). The inflorescence of ‘Yanricai’ is apical and spherical, consisting of 8 to 14 flowers. ‘Yanricai’ is covered with dense and compact flowers when blooming (Fig. 1A–C). By contrast, *R. dauricum* shows few flowers with one to four flowers per inflorescence

Table 1. Morphological traits of ‘Yanricai’ and *R. dauricum*.

Traits	‘Yanricai’	<i>Rhododendron dauricum</i>
Plant height (cm)	$101.23 \pm 0.22\text{ a}$	$87.56 \pm 0.06\text{ b}$
New stem length (cm)	$19.56 \pm 0.02\text{ a}$	$15.59 \pm 0.06\text{ b}$
Leaf length (cm)	$3.84 \pm 1.27\text{ a}$	$3.39 \pm 0.66\text{ a}$
Leaf length/width	$2.19 \pm 0.09\text{ a}$	$2.08 \pm 0.11\text{ a}$
Young Leaves	RHS 141A	RHS 141A
Mature leaves	RHS 185A	RHS 185A
Corolla diameter (cm)	$3.81 \pm 0.37\text{ a}$	$3.45 \pm 0.20\text{ a}$
Corolla lobes	Undulation of margin	Weak undulation of margin
Flower shape	Wide funnel-shaped	Wide funnel-shaped
Flower array	Compact	Sparse
Pistil/stamens in length	Longer	Longer
Flower number	8–14	1–4
Flower color	Purple (RHS 78A)	Red-purple (RHS N74B)
Inflorescence shape	Spherical	Umbrel
Flower period	1–15 May	1–15 May

RHS = Royal Horticultural Society.

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Fig. 1. Morphological characteristics of ‘Yanricai’ and *Rhododendron dauricum* in the Heilongjiang Forestry Institute in May 2022. ‘Yanricai’: (A) dense flowers, (B) abundant flower buds, (C) spherical inflorescence; *R. dauricum*: (D) spare flowers, (E) sparse flower buds, (F) umbel inflorescence.

(Fig. 1D–F). The flower color of ‘Yanricai’ falls into the purple group (RHS 78A), whereas the flower of *R. dauricum* is red-purple (RHS N74B). Flowers of ‘Yanricai’ bloom from early May to middle May, same as *R. dauricum* in Heilongjiang Province, China. The pistils of ‘Yanricai’ are longer than the stamens. ‘Yanricai’ can survive in winter in Harbin without any cold protection; therefore, this variety has great application potential in northeast China.

#### Propagation and Culture

For *in vitro* culture, shoots are collected during the growing season (June to July).

Samples are first disinfected using 4% sodium hypochlorite and 75% alcohol, and then cultured in the differentiation medium [1/2 MS agar supplemented with  $0.75 \text{ mg}\cdot\text{L}^{-1}$  of zeatin (ZT), and  $0.05 \text{ mg}\cdot\text{L}^{-1}$  of 1-naphthaleneacetic acid (NAA)]. Once axillary buds reach 2 cm, they are cut from the shoots and transferred to fresh differentiation medium. Newly generated clones are allowed to grow to 3 to 4 cm and then transferred to the rooting medium (1/2 MS supplemented with  $0.75 \text{ mg}\cdot\text{L}^{-1}$  of NAA). When the roots grow more than 2 cm in length (~1 month in the rooting medium), the plantlets are transferred to pots containing peat: perlite = 3:1 mixture soil in the greenhouse. When the plants grow to 20 cm in the spring of the second year, they can be

moved to the field. Optimal growth conditions include crown density of 30% to 40% within  $5 \text{ m} \times 5 \text{ m}$  quadrant, pH of 5.5~7.0, and field water capacity of 40%~60%.

#### Availability

Information on plant materials can be obtained from Ling Wang (wanglinghlj@126.com) at the College of Landscape Architecture, Northeast Forestry University, Harbin, China.

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