‘Taoyuan No. 1 Rose Girl’: A Double-flowered Periwinkle, *Catharanthus roseus*

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Periwinkle [*Catharanthus roseus* (L.) G. Don.], a member of the Apocynaceae family, is endemic to Madagascar. This herbaceous plant grows to 80 cm high and blooms continuously year-round with pink, purple, or white flowers (Hogan, 2003). A program to conserve and protect this species has been established, because it produces secondary metabolites such as terpenoid indole alkaloids that may be used to treat cardiac diseases and certain tumors in mammals (Favali et al., 2004).

Catharanthus roseus has become pantropical by escaping from cultivation and naturalizing in many other regions (Levy, 1981). The flower is functionally close to cleistogamous with pollination limited by the foraging behavior of insects, and thus seed production is expensive (Miyajima, 2004). Breeding efforts have resulted in many new forms and cultivars, making them valued as bedding plants and flowering potted plants (Armitage, 2001). However, few double-flowered periwinkle cultivars are available on the markets.

Flower doubleness may increase the horticultural value of the plant. ‘Taoyuan No. 1 Rose Girl’ was selected from a cross between a double-flowered mutant identified from a self-pollinated ‘Pacifica Polka Dot’ population and a line derived from selfing ‘Titan Burgundy’. The horticultural traits of this newly released cultivar are described below.

Origin

All the breeding, selection, and performance studies were carried out in natural greenhouse conditions (20 to 30 °C, 12- to 13.5-h daylengths) in Taoyuan District Agricultural Research and Extension Station. A double-flowered mutant was identified from a self-pollinated ‘Pacifica Polka Dot’ population. Because of showy double petals

and compact characteristics, the plant was selected, mass-propagated with tip cuttings, and labeled as TYV1 (Fig. 1).

Hybridization was carried out in June 2007. The stamens of TYV1 were excised using tweezers with sharp ends (emasculum) 2 d before anthesis to prevent self-pollination. A carbon-fiber fishing line (0.37 mm diameter) was inserted from a narrow opening of the apex of the corolla tube at anthesis to obtain fresh pollens of TYV3, as described by Miyajima (2004). The paternal line TYV3 is a progeny from selfing ‘Titan Burgundy’ and was chosen for its vigorous growth and early flowering. In Mar. 2008, 600 cross-pollinated seeds were sown and 403 young plants were obtained. The double-flowered line TYV07S2058 was selected for its high rooting percentage of cuttings and flowering quality and named ‘Taoyuan No. 1 Rose Girl’ (Fig. 2) for performance studies.

Description and Performance

The following color description was based on The Royal Horticultural Society’s (RHS) color chart (Royal Horticultural Society, 2007). Plant height of ‘Taoyuan No. 1 Rose Girl’ ranges from 13 to 18 cm. Stem and adaxial petiole anthocyanin coloration are weak. Leaf is elliptic and medium green. Leaf length is short (5 to 6 cm) and leaf width is medium (2 to 3 cm). Flowers are doubled with 2.9 to 3.6 cm diameter. The petal is fan-shaped and mainly red-colored (RHS 68B). The outer-whirl petals are close with their margins touching. Inner-whirl petals are curled tubular. Eye zone is red-colored (RHS 61C).

Three comparable studies between ‘Taoyuan No. 1 Rose Girl’ and the parent ‘Pacifica Polka

Dot’ was conducted in winter of 2008 and spring and summer of 2009, respectively. Plants of both cultivars, propagated by tip cuttings, were grown in 12-cm diameter pots containing 3 peat:1 perlite (by volume). The experiments were arranged with completely randomized design with three replications of 10 plants each. Days to rooting and flowering, plant height, lateral branch number after one soft pinching, and flower diameter were recorded. The difference between the two cultivars was compared by *t* test at $P \leq 0.05$.

‘Taoyuan No. 1 Rose Girl’ rooted in 20.7 d compared with 22.3 d for ‘Pacifica Polka Dot’. However, ‘Taoyuan No. 1 Rose Girl’ required 38.5 d to flower compared with 34.7 d of ‘Pacifica Polka Dot’ (Table 1). Plant height of ‘Taoyuan No. 1 Rose Girl’ at flowering was 13.1 to 14.9 cm and 11.0 to 13.8 cm for ‘Pacifica Polka Dot’ (Tables 1 and 2). Branch number did not differ between two cultivars (data not shown). Because the flowers of ‘Taoyuan No. 1 Rose Girl’ are funnel-shaped,

Fig. 1. Double-flowering phenotype of TYV1 *Catharanthus*.

Fig. 2. The double-flowered *Catharanthus* ‘Taoyuan No. 1 Rose Girl’ in the greenhouse of Taoyuan District Agricultural Research and Extension Station (20 to 30 °C, 12- to 13.5-h natural daylengths).

Table 1. Growth and flowering performance of ‘Taoyuan No. 1 Rose Girl’ and its parental cultivar, Pacifica Polka Dot, in a greenhouse of Taoyuan District Agricultural Research and Extension Station in Winter 2008.

Cultivar	Days to rooting	Plant ht (cm)	Days to flowering	Flower diam (cm)
Taoyuan No. 1 Rose Girl	20.7	13.1	38.5	3.5
Pacifica Polka Dot	22.3	11.0	34.7	4.7
<i>t</i> test	*	*	*	*

*Significant at $P \leq 0.05$.

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Table 2. Plant height and flower diameter of ‘Taoyuan No. 1 Rose Girl’ and its parental cultivar, Pacifica Polka Dot, in a greenhouse of Taoyuan District Agricultural Research and Extension Station in 2009.

Cultivar	Plant ht (cm)	Flower diam (cm)
	<i>Spring trial</i>	
Taoyuan No. 1 Rose Girl	14.9	3.4
Pacifica Polka Dot	13.8	4.7
<i>t</i> test	*	*
Cultivar	Plant ht (cm)	Flower diam (cm)
	<i>Summer trial</i>	
Taoyuan No. 1 Rose Girl	13.5	3.1
Pacifica Polka Dot	11.8	4.7
<i>t</i> -test	*	*

*Significant at $P \leq 0.05$.

the flower diameter was smaller than ‘Pacifica Polka Dot’ (Tables 1 and 2).

Uses

‘Taoyuan No. 1 Rose Girl’ is selected for its unique double-flowered trait and can be

Fig. 3. Double-flowered *Catharanthus* ‘Taoyuan No. 1 Rose Girl’ grown in a 15-cm pot 90 d after one soft pinching.

produced as flowering potted plants (Fig. 3) and bedding plants for dry sandy sites. In subtropical areas, ‘Taoyuan No. 1 Rose Girl’ can be propagated by cuttings and produced year-round.

Availability

Taiwan Plant Breeder’s Right has been granted by the Council of Agriculture,

Executive Yuan, Taiwan, Republic of China. A limited quantity of liners may be available for research purposes only by sending a request to the first author (jimney@tydais.gov.tw).

Literature Cited

- Armitage, A.M. 2001. Armitage’s manuals of annuals, biennials, and half-hardy perennials. Timber Press, Portland, OR.
- Favali, M., R. Muestti, S. Benvenuti, A. Bianchi, and L. Pressacco. 2004. *Catharanthus roseus* L. plants and explants infected with phytoplasmas: Alkaloid production and structural observations. *Protoplasma* 223:45–51.
- Hogan, S. 2003. *Flora: A gardener’s encyclopedia*. Timber Press, Inc., Portland, OR.
- Levy, A. 1981. *Catharanthus roseus*, p. 166–168. In: Halevy, A.H. (ed.). *CRC handbook of flowering*. Vol. II. CRC Press, Boca Raton, FL.
- Miyajima, D. 2004. Pollination and seed set in vinca [*Catharanthus roseus* (L.) G. Don]. *J. Hort. Sci. Biotechnol.* 79:771–775.
- Royal Horticultural Society. 2007. *The Royal Horticultural Society’s colour chart*. 5th Ed. Royal Hort. Soc., London, UK.