

Breeding of *Yapara Tariflor Pink Fairy* ‘Tainung No. 2-Pink Fairy’ by Intergeneric Hybridization

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For many people, growing flowers, particularly orchids, is both a hobby and a fashion trend. There are numerous cultivars of the *Phalaenopsis* orchid on the market. In addition to a wide array of colors, there are also various shapes and flower sizes. However, except for a few classic cultivars such as *P. Sogo Yukidian* V3, *P. Big Chili*, *P. Queen Beer Red Sky*, and *P. Little Gem Stripes YH-9769*, which have existed in the commercial market for many years, most cultivars do not stay in circulation for a long time. There are approximately 400 *Phalaenopsis* growers in Taiwan, and 300 people are engaged in breeding (Lai 2016; Zeng 2016). Although there are various types and colors of cultivars sold in both domestic and foreign markets, *Phalaenopsis* growers still continue to release new cultivars every year. In the past 10 years, cultivar rights were granted for more than 100 cultivars annually, although there was a reduction in applications during 2020 to 2022, likely because of the outbreak of the pandemic. These releases aim to provide consumers with a greater variety and fresher options to attract attention and enhance purchasing interest, thus improving market competitiveness.

P. spp. were used as parent plants to cross with other orchid genera, resulting in successful breeding of many hybrids and the selection of superior plants for certain purposes (Wu et al. 2016). However, high failure rates of intergeneric hybridization occurred. Hybridization reported in this work can be used as intermediate parents for future breeding between alliance genera, with the goal of improving the success rate of hybridization and developing unique horticultural traits, such as pleasant color, blooming in the summer, good proportions of the pedicel and plant, and others. Most importantly, most intergeneric hybrids bloomed and faded at the same time, but the phenomenon did not occur with this hybridization. We report that the intergeneric hybrid *Yapara Tariflor Pink Fairy* ‘Tainung No. 2-Pink Fairy’ was successfully

bred through intergeneric hybridization and selected for proliferation.

Origin

Yapara Tariflor Pink Fairy ‘Tainung No. 2-Pink Fairy’. All of the breeding, including crossing, selection, and performance studies, were performed under natural greenhouse conditions at the Floricultural Experiment Branch, Taiwan Agricultural Research Institute. Flowering plants of *P. pulcherrima* fma. *coerulea* and *Vandachostylis* Lilac Blossom were grown in a pad-and-fan greenhouse. *P. pulcherrima* fma. *coerulea* was used as the seed parent that was crossed with the clone of *Van. Lilac Blossom* in Jul 2009. In Nov 2009, mature capsules were harvested and surface-sterilized with 70% ethanol, followed by immersing them in 1% sodium hypochlorite solution for 20 min; then, they were rinsed three times with sterile distilled water. In a laminar hood, capsules were cut open and seeds were scooped out with forceps onto the Murashige and Skoog (MS) medium that had half-strength macroelements and full-strength microelements (Murashige and Skoog 1962) supplemented with the following (mg·L⁻¹): myo-inositol (100); niacin (0.5); pyridoxine HCl (0.5); thiamin HCl (0.1);

glycine (2.0); mashed potato (30,000); sucrose (20,000); Difco Bacto agar (7000); and activated charcoal (1000). The pH of the medium was adjusted to 5.7 before autoclaving at 121 °C and 103 kPa (1.05 kg·cm⁻²) pressure for 20 min. Seeds in flasks were incubated at 25 ± 1 °C under a 14-h photoperiod at an irradiance of 40 μmol·m⁻²·s⁻¹ photosynthetic photon flux (daylight cool white fluorescent light, TOA lighting, FL40/36D-EX/T8). After 12 to 15 months of incubation, 76 seedlings were removed from flasks and grown in sphagnum moss under natural greenhouse conditions from Dec 2010 to Mar 2011 (20 to 30 °C, 12 to 13.5 h daylength). Fertilization was performed once every 1 to 2 weeks during the cultivation period. Peters 20N–8.6P–16.6K (20N–20P₂O₅–20K₂O) water-soluble fertilizer (Scotts Company, Marysville, OH, USA) at 1.0 g·L⁻¹ was added to tap water as the fertilizer solution. Seedling plants flowered naturally in Jul 2013. This hybrid was registered as *Yapara Tariflor Pink Fairy* with the International Orchid Registrar, Royal Horticultural Society (RHS), England, on 2 Jul 2014. The cultivar A9 was selected among the seedling plants. Flower stalk nodes were used for vegetative proliferation in Nov 2016. These cloned *Yap. Tariflor Pink Fairy* ‘A9’ first bloomed in Jun 2020.

Description and performance. The clones were grown in 9.09-cm plastic pots with sphagnum moss. Fifteen plants were used for comparisons of these two cultivars. When *Yap. Tariflor Pink Fairy* ‘A9’ was compared with *P. Evarise Blue Angel*, a clone visually similar to the former, 16 traits were distinguished as different from the latter (Table 1). The following color descriptions are based on the color chart of the RHS (Royal Horticultural Society 2015).

Plant height of *Yap. Tariflor Pink Fairy* ‘A9’ and *P. Evarise Blue Angel* are 28.8 cm and 12.7 cm, respectively (Table 1, Fig. 1). The flower shape of *Yap. Tariflor Pink Fairy* ‘A9’ is convex, and that of *P. Evarise Blue*

Table 1. Comparisons of *Yapara Tariflor Pink Fairy* ‘Tainung No. 2-Pink Fairy’ and *P. Evarise Blue Angel* plant, leaf, and flower.

Trait	<i>Yapara Tariflor Pink Fairy</i> ‘Tainung No. 2-Pink Fairy’	<i>P. Evarise Blue Angel</i>
Plant height, cm	28.8 ± 0.8 a	12.6 ± 0.5 b
Flower shape	Convex	Flat
Leaf upper side color	Pale green	Green
Dorsal sepal: color of front surface	Brilliant purple N81C	Strong purple N82B
Lateral sepal: color of front surface	Brilliant purple N81C	Strong purple N82B
Petal: color of front surface	Light purple 76A	Strong purple N82B
Lip: shape of apical lobe	Obovate	Circular
Lip: front surface color of pseudopeloria	Deep purple (N81A)	Dark purple (83A)
Apical lobe: color of front surface	Deep purple (N81A)	Dark purple (83A)
Lateral lobe: color of front surface	Strong reddish purple (NN78B)	Brilliant yellow (15C)
Flowers, no.	27.7 ± 1.5 a	8.6 ± 0.6 b
Flower diameter, cm	2.7 ± 0.1 a	2.4 ± 0.0 b
Dorsal sepal length, mm	14.5 ± 0.2 a	12.1 ± 0.2 b
Dorsal sepal width, mm	8.1 ± 0.1 a	7.7 ± 0.2 a
Lip length, mm	10.2 ± 0.2 a	7.6 ± 0.1 b
Lip width, mm	8.2 ± 0.1 b	11.1 ± 0.2 a

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Fig. 1. Plants of *Yapara* Tariflor Pink Fairy 'Tainung No. 2-Pink Fairy' (left) and *P. Evarise* Blue Angel (right).



Fig. 2. Flowers of *Yapara* Tariflor Pink Fairy 'Tainung No. 2-Pink Fairy' (left) and *P. Evarise* Blue Angel (right).

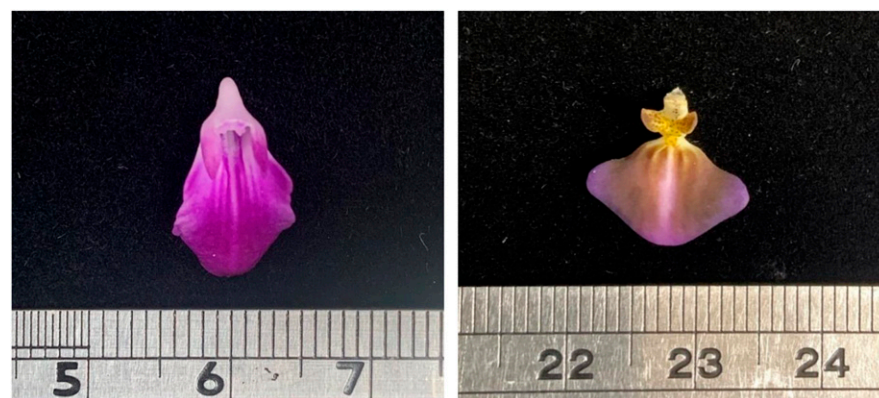


Fig. 3. Lips of *Yapara* Tariflor Pink Fairy 'Tainung No. 2-Pink Fairy' (left) and *P. Evarise* Blue Angel (right).

Angel is flat. The *Yap. Tariflor* Pink Fairy 'A9' leaf abaxial side is pale green, whereas that of *P. Evarise* Blue Angel is green.

The front surface color of the dorsal and lateral sepals for *Yap. Tariflor* Pink Fairy 'A9' and *P. Evarise* Blue Angel are brilliant purple (N81C) and strong purple (N82B),

respectively. The front surface color of the petal for *Yap. Tariflor* Pink Fairy 'A9' is purple, whereas that for *P. Evarise* Blue Angel is strong purple (N82B).

The shapes of the lip apical lobe for *Yap. Tariflor* Pink Fairy 'A9' and *P. Evarise* Blue Angel are obovate and circular, respectively.

The front surface color of the lip pseudopetala is deep purple (N81A) for *Tariflor* Pink Fairy 'A9', and it is dark purple (N83A) for *P. Evarise* Blue Angel.

The front surface colors of the lip apical lobe and lateral lobe for *Yap. Tariflor* Pink Fairy 'A9' are deep purple (N81A) and strong reddish purple (NN78B), respectively and those for *P. Evarise* Blue Angel are dark purple (83A) and brilliant yellow (15C), respectively. *Yap. Tariflor* Pink Fairy 'A9' has a higher average flower count (24.7) than that of *P. Evarise* Blue Angel (8.6). The flower diameter of *Yap. Tariflor* Pink Fairy 'A9' is 2.7 cm, and the flower size of *P. Evarise* Blue Angel is 2.4 cm (Fig. 2).

The dorsal sepal length and width of *Yap. Tariflor* Pink Fairy 'A9' are 14.5 mm and 8.1 mm, respectively, and those of *P. Evarise* Blue Angel are 12.1 mm and 7.7 mm, respectively. The lip length and width of *Yap. Tariflor* Pink Fairy 'A9' are 10.2 mm and 8.2 mm, respectively, and those of *P. Evarise* Blue Angel are 7.6 mm and 11.1 mm, respectively (Fig. 3).

Availability

Questions concerning *Yapara* Tariflor Pink Fairy Tainung No. 2-Pink Fairy and this research should be addressed to Dr. Rung-Yi Wu (e-mail: iris12@tari.gov.tw) at the Floricultural Experiment Branch, Taiwan Agricultural Research Institute, Ministry of Agriculture, Taiwan.

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