

# The *Passiflora* Hybrid P. 'Excel': *P. edulis* (♀) × *P. caerulea* (♂)

Leslie A. King

27 Ivar Gardens, Basingstoke, Hampshire, RG24 8YD, UK, [la.king@virgin.net](mailto:la.king@virgin.net)

## Summary

The cultivation and characteristics of the hybrid *P. edulis* × *caerulea* are described and the name P. 'Excel' is proposed. No other hybrid of these two species is known to be in cultivation.

## Introduction

Amongst the cultivated passion vines, *P. edulis* SIMS is the most widely grown for fruit production, whereas *P. caerulea* L. (the hardy or blue passion flower) is a common ornamental garden climber. *P. caerulea* has been widely used to produce hybrids, especially as the pollen parent. A cross between *P. edulis* f. *flavicarpa* and *P. caerulea* was produced by Moser [1] and named P. 'Dark Star', but it is thought that this is no longer in cultivation. Given that these two species are so ubiquitous, it is surprising that there appear to be no other reports of their deliberate hybridisation.

Although many hybrids have been raised in the hope of creating plants with decorative flowers, relatively few attempts have been directed solely at fruit production. In the early 1970's, the United States Department of Agriculture (USDA) experimented with hybrids based on *P. incarnata*. The objective was to produce plants

which were both hardy and yielded commercially-acceptable fruit. Although that program was not completely successful, a by-product was the creation of P. 'Incense', an attractively-flowered hybrid of *P. incarnata* and *P. cincinatta* [2]. McCain [3] has described the hybridisation of members of the Tacsonia sub-genus. Although not hardy, they have been proposed as a source of fruit for cool sub-tropical areas. Tetraploid forms or hybrids of certain species have been generated [4,5], some of which could have commercial potential in temperate climates.

The present study has the same general objective, namely to produce edible fruit from a hardy vine. Whereas *P. edulis* grows best in a tropical environment and will not tolerate a prolonged frost, *P. caerulea* is much more hardy, but forms an insipid fruit. It was thought feasible that the good qualities of each species could be combined either in the F<sub>1</sub> hybrid or by subsequent backcrosses to the parents.

## Cultivation of *P. edulis* (♀) × *P. caerulea* (♂)

A preliminary note on this hybrid has been published [6]. In early 1997, a number of *P. edulis* plants were raised from the seeds in a single purple fruit purchased at a local supermarket. The ultimate source of the fruit was unknown. Although few flowers formed in 1998, it was noticed that the plants were largely self-sterile. Since *P. edulis* f. *edulis* is normally self-fertile, this suggested that the fruit could have originated from either a hybrid of *P. edulis* f. *edulis* and *P. edulis* f. *flavicarpa* or it was a so-called 'purple flavicarpa', i.e. a selected form of *P. edulis* f. *flavicarpa* many of which have low self-fertility. For the purposes of the present report, the plants grown from those seeds will be described simply as *P. edulis*.

In April/May 1999, flowers on two *P. edulis* plants growing in a conservatory were fertilised with pollen from *P. caerulea*. No other *Passiflora* species were in flower in the immediate neighbourhood, and contamination by insects carrying unknown pollen could be ruled out. Over 90% of the pollinated flowers failed to set, and most of those that did only yielded around 10 seeds per fruit. Cross-pollinated fruit was often smaller (some only 2 cm long) than fruit set using pollen from



*Passiflora* 'Excel.' Black and White just doesn't do it justice, see the color photo on the **Passiflora** website. Photo by Les King.

**Table 1. Comparison of the main features of *P. caerulea*, *P. 'Excel'*, and *P. edulis***

	<i>P. caerulea</i>	<i>P. 'Excel'</i>	<i>P. edulis</i>
<b>Vine/Stem</b>	glabrous/terete	glabrous/terete	glabrous/terete
<b>Stipules</b>	semi-ovate, 2 cm x 1 cm	variable, semi-ovate or lanceolate to 1.5 cm, contorted, some serrated	linear 0.5 cm, occasionally lanceolate to 1.5 cm
<b>Petioles</b>	2.5 - 3 cm	2.5 - 3.5 cm	2.5 - 3.5 cm
<b>Petiole glands</b>	two stalked, up to 1 cm from apex	two stalked, up to 1 cm from apex	two sessile, at apex
<b>Leaves</b>	mostly 5-lobed, to 15 x 13 cm, entire	3-lobed, occasionally 4/5-lobed to 18 x 20cm, entire, lustrous above, soft	soft 3-lobed, to 20 x 20 cm, serrated, corrugated, lustrous above, stiff
<b>Peduncles</b>	upright, 7 cm	upright, 7 cm	lateral, 5 cm
<b>Tendrils</b>	to 18 cm	to 28 cm	to 18 cm
<b>Bracts</b>	ovate, enclose developing bud, ovate, 2.5 x 2 cm	ovate, serrated, enclose developing bud, 2.5 x 2 cm, glands present	serrated, set apart from developing bud, 1.5 x 1 cm, numerous glands
<b>Flowers</b>	8 cm wide	8 cm wide	6 cm wide
<b>Sepals</b>	3.5 cm x 2.5 cm, green outside, white inside, short awn	3.5 cm x 2.5 cm, green outside, white inside, short awn	2.5 cm x 1 cm, green outside, white inside, short awn
<b>Petals</b>	3 cm x 1.5 cm, white both sides	3 cm x 1.5 cm, white both sides	2.5 cm x 0.7 cm, white both sides
<b>Corona filaments</b>	2 main (outer) series blue at apex, white, purple at base, shorter than petals	2 main (outer) series crinkled white at apex, blue, white at base, same length as petals	2 main (outer) series white at apex, purple at base, crinkled from apex to base, same length as petals
<b>Styles</b>	dark purple, mottled	dark purple, mottled	light green
<b>Stamens</b>	green	fine purple spots on green	purple spots on green

another *P. edulis* plant. The seeds in six of the fruits from the *P. caerulea* pollination were mixed and planted out in late July 1999. Almost all germinated within three weeks at a temperature of 20-25°C. They were thinned to around 20 seedlings. The first leaves were simple up to a stem length of about 20 cm. By late 1999, some of the seedlings were over 30 cm tall, but it was clear that there were two types. Around half were identical to *P. edulis* seedlings. It was concluded that these had originated from accidental cross-fertilisation

and were therefore discarded. The remaining seven plants were all broadly similar, but quite distinct from *P. edulis*; they also grew more vigorously than either *P. edulis* or *P. caerulea*, particularly in the winter months (latitude 51°N) when the parent plants were dormant (minimum temperature 10°C). One of the hybrid seedlings was particularly vigorous and produced many flowers from early June, 2000. All mature seedlings had 3-lobed leaves, but the proportion of 5-lobed leaves was variable. The most vigorous and floriferous plant (described in detail below) produced occasional 4/5-lobed leaves, but in others these were the dominant type of foliage.

### Nomenclature and related hybrids

It is proposed that the most vigorous seedling of the hybrid *P. edulis* x *caerulea* is named *P. 'Excel'*, an acronym derived from *edulis* x *caerulea*. Moser [1] claimed that *P. 'Dark Star'* (*P. edulis* f. *flavicarpa* x *caerulea*) was similar to *P. 'Sapphire'*, a hybrid raised by Vanderplank [7] and originally described as *P.*

*edulis* f. *flavicarpa* x *P. quadrifaria*. Doubts have been raised about the parentage of *P. 'Sapphire'*; it has been suggested that it is an accidental cross between *P. edulis* f. *flavicarpa* and *P. caerulea*. Although *P. 'Sapphire'* is similar to *P. 'Excel'*, it differs in the coloration of the filaments. However, as noted earlier, the female parent of *P. 'Excel'* was either *P. edulis* f. *edulis* or a hybrid of that form. Thus any comparison of *P. 'Excel'* with *P. 'Sapphire'* may be invalid. Not surprisingly, *P. 'Excel'* shares a number of common features with the

closely-related hybrids P. 'Finlandia', (also known as P. 'Tinalandia', [8]), a cross made by Patrick Worley of *P. edulis* f. *flavicarpa* with *P. incarnata*, and the long-established *P. xcolvillii* SWEET (*P. incarnata* x *P. caerulea*).

### Hybrid characteristics

Table 1 sets out the main features of the hybrid P. 'Excel' and those of the parent plants. Apart from a more vigorous growth, P. 'Excel' also has larger leaves and longer tendrils than either *P. edulis* or *P. caerulea*. Despite the common assertion that hybrids tend to resemble the female parent, the overall impression of P. 'Excel' is that it appears more similar to *P. caerulea*. Coloured images of the flowers and foliage of P. 'Excel' are available from the author as '.jpg' files. (NB: A color version of this article may also be found in Adobe Acrobat format (PDF) on the *Passiflora* website at [www.esb.utexas.edu/philjs/PSI/psi.html](http://www.esb.utexas.edu/philjs/PSI/psi.html) under "Recent Issue Contents." - Ed.)

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