

‘Alisio 15[®]’: An Early-maturing Peach Cultivar for the Fresh Fruit Market

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‘Alisio 15[®]’, a new peach [*Prunus persica* (L.) Bastch] for the fresh market, resulted from a cross made in Murcia (Spain) as part of the IMIDA-NOVAMED breeding program with the aim of breeding new early-ripening cultivars with dark red skin, good size, and high sugar content as an improvement over other early cultivars currently available. This cultivar combines very early-season ripening, extensive red-blushed skin, and very good eating quality of the fruit. Few peaches in the Mediterranean area are marketable in the very early season (mid-April to early May) and the European-wide demand for early-maturing peaches exceeds supply. In this respect, the new cultivar, Alisio 15[®], has the potential to contribute to the supply of fresh fruit and provide an improvement in the quality of early fruit.

Origin

‘Alisio 15[®]’ originated from an open pollination of the selection S2099, which was obtained from a cross between ‘Candor’ and the low-chill requirement cultivar Flordaprince released by the University of Florida (Okie, 1998; Sherman et al., 1982) (Fig. 1). The open-pollinated seeds were collected in 2005 at the Torreblanca Field Station, Torre Pacheco, Murcia, Spain, and the seeds were germinated through in vitro embryo rescue and grown in the greenhouse until planting in Mar. 2006. Seedlings fruited for the first time in May 2007.

‘Alisio 15[®]’ was preselected in a high-density planting of seedlings in the Torreblanca Field Station, Torre Pacheco, Murcia, Spain (lat. +37°46’ N, long. 0°53’ W). The location where the seedlings were grown is an altitude of 36 m above sea level (m.a.s.l.) with an average chill accumulation of 400 to 600 h below 7 °C, mostly as a result of the prevailing maritime climate. The selection was grafted on ‘Garnem[®]’ (Garfi × Nema-guard, *P. amygdalus* × *P. persica*) rootstock and planted at the same location. The tree and fruit were evaluated in 2010, 2011, and 2012. Trees also propagated on ‘Garnem[®]’ were planted in Hoya del Campo, Abarán, Murcia,

Received for publication 10 Apr. 2014. Accepted for publication 17 Nov. 2014.

We thank to Julio del Olmo, Marcos López, Belén López, and Pablo Cosmen for technical assistance in developing the cultivar.

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Spain [lat. +38°14’ N, long. 1°20’ W], 200 m.a.s.l., and with a chill accumulation of 570 h below 7 °C.

Description

The low-chill requirements of this cultivar are indicated by its adaptation to the climatic conditions of southeast Spain. The tree is semiupright and vigorous with no blind nodes. The flower density is high (48 flowers/m), with two flowers per node at least, and blooming is uniform (Frett et al., 2013; Reig et al., 2013). The flowers are medium-large size, pink, showy, and pollen-fertile. The leaves are lanceolate in shape with crenulated margins and globose leaf glands. Leaves are dark green and medium-sized (163 mm long, 47 mm wide, and the petiole 11 mm) based on a random sample of 30 shoots and leaves taken from the midpoint of each shoot (Fig. 2).

The major advantages of ‘Alisio 15[®]’ relative to current cultivars are its earliness and attractiveness. The fruit is oblate with a recessed tip and of medium weight (110 to 120 g) (Table 1). The suture is not very pronounced, and the fruit skin has a fine, short, and netted pubescence. The entire fruit surface is an attractive mottled dark red (Fig.

2), even in non-sun-exposed fruits of the tree, and with some spots. The fruit flesh is an attractive bright yellow, melting, clingstone, and with good fresh eating quality. At the commercial maturity stage, the fruits are sweet (10.6 °Brix on average) with medium acidity (10.2 g of malic acid/L) (Table 1). The fruit development period for this selection averages 88 ± 5 d. ‘Alisio 15[®]’ ripens 1 week before ‘Zaibulo[®]’ and ‘Plagold 5[®]’, the earliest peach varieties grown in the Mediterranean production area (Fig. 3). Under the climatic conditions in Murcia (Spain), the ripening date is the first week of May, when there is very limited competition from peaches produced in other European countries.

Molecular Characterization

Molecular characterization of ‘Alisio 15[®]’ and the selection parent S2099 was performed using microsatellites [simple sequence repeat (SSR)] following Maghuly et al. (2005). Genomic DNA was isolated from young fresh leaves using the DNeasy Plant Mini Kit (Qiagen). The following 16 primer pairs flanking microsatellites, previously developed in *Prunus*, were assayed (Table 2): BPPCT001, BPPCT007, BPPCT008, BPPCT015, BPPCT017, BPPCT025, BPPCT038, CPPCT006,

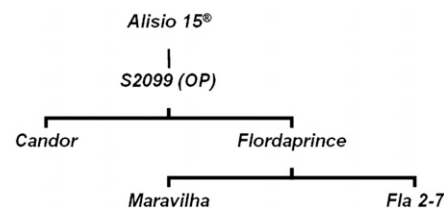


Fig. 1. Pedigree of ‘Alisio 15[®]’ peach.

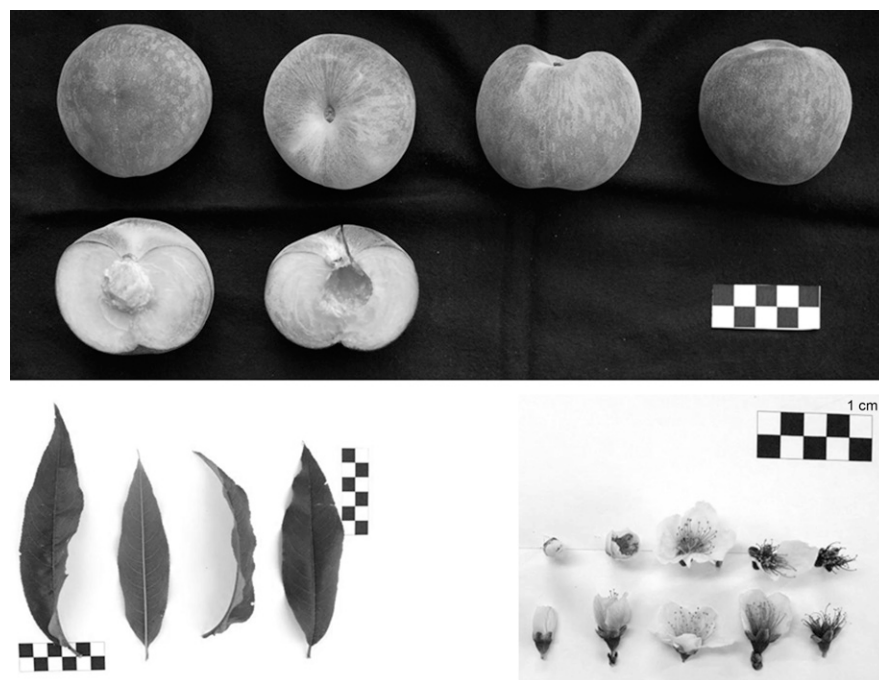


Fig. 2. Fruits, leaves, and flowers of ‘Alisio 15[®]’ peach.

Table 1. Bloom and ripening date, and main qualitative traits of 'Alisio 15[®]' fruit at Torreblanca and Hoya del Campo (Murcia, Spain).

	Torreblanca (36 m.a.s.l.)			Hoya del Campo (200 m.a.s.l.)		
	2010	2011	2012	2010	2011	2012
Flowering date (full bloom) ^z	8 Feb.	28 Jan.	2 Feb.	15 Feb.	5 Feb.	13 Feb.
Ripening date ^z	28 Apr.	25 Apr.	4 May	17 May	7 May	10 May
Fruit weight (g) ^y	109	121	120	107	109	103
Firmness (kg·cm ⁻²) ^{y,x}	3.85	3.99	3.55	3.94	3.34	3.62
SSC (°Brix) ^y	10.3	9.7	11.15	11.4	9.5	11.5
Acidity (g·L ⁻¹ malic) ^y	10.39	11.62	11.21	9.02	9.78	9.29
Red blush (%) ^y	70.0	62.0	69.2	55.6	61.7	60.0

^zFull bloom = 70% flowers open; ripening date = date when 20% of the fruit is firm ripe.

^yData for fruit weight, soluble solids, acidity, firmness, and percent blush based on a 50-fruit sample collected.

^xFruit firmness was measured with a Penefel 14 dft firmness tester using an 8-mm tip with fruit epidermis removed (Agro Technologie, France).

SSC = soluble solids content.

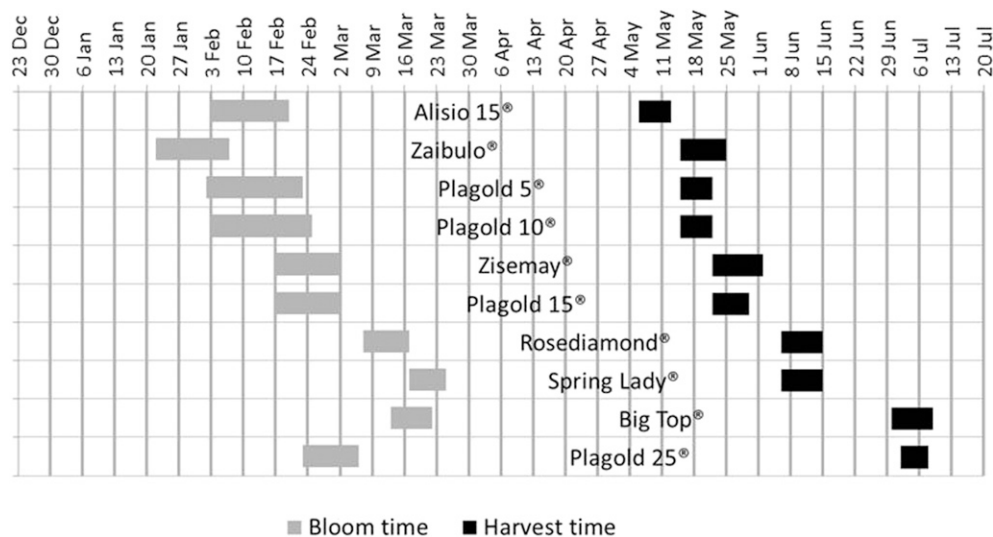


Fig. 3. Bloom and harvest period of 'Alisio 15[®]' relative to other peach cultivars in La Hoya del Campo (Abarán, Murcia, Spain) during 2012.

Table 2. Molecular characterization of the peach genotypes 'Alisio 15[®]' and its parent S2099 using simple sequence repeat (SSR) markers.

SSR marker	Reference	Fluorophore ^z	Size of amplified bands			
			Alisio 15 [®]		S2099	
BPPCT001	Dirlewanger et al., 2002	6-FAM	158	158	154	158
BPPCT007	Dirlewanger et al., 2002	PET	151	151	147	151
BPPCT008	Dirlewanger et al., 2002	6-FAM	154	156	154	156
BPPCT015	Dirlewanger et al., 2002	NED	168	168	160	168
BPPCT017	Dirlewanger et al., 2002	PET	155	182	165	182
BPPCT025	Dirlewanger et al., 2002	NED	195	195	195	195
BPPCT038_I	Dirlewanger et al., 2002	VIC	124	128	124	136
BPPCT038_II	Dirlewanger et al., 2002	VIC	151	155	151	163
CPPCT006	Aranzana et al., 2002	NED	185	188	185	188
CPPCT017	Aranzana et al., 2002	6-FAM	178	178	178	189
CPPCT022	Aranzana et al., 2002	VIC	250	250	250	250
CPPCT044	Dirlewanger et al., 2004	VIC	256	261	256	261
UDP96-005	Cipriani et al., 1999	6-FAM	171	173	171	173
UDP98-022	Testolin et al., 2000	PET	138	138	138	138
UDP98-409	Cipriani et al., 1999	PET	127	127	127	127
UDP98-410	Testolin et al., 2000	NED	141	144	141	144
UPD98-412	Testolin et al., 2000	PET	127	129	129	129

^zForward primers were modified at the 5' end with a fluorescent label: 6-FAM (blue), NED (yellow), VIC (green), or PET (red).

CPPCT017, CPPCT022, CPPCT044, UDP96-005, UDP98-022, UDP98-409, UDP98-410, and UDP98-412. Fluorescently labeled microsatellite fragments were analyzed on an ABI 3730 capillary sequencer (Genómica-Campus Moncloa del Parque Científico de Madrid, www.fpcm.es). Fragment sizing was performed using the GeneMapper analysis software (Applied Biosystems, Carlsbad, CA). The SSR fingerprinting provides a tool to uniquely

identify this cultivar with a very low probability of confusion with other cultivars.

Availability

This cultivar obtained by the IMIDA-NOVAMED peach breeding program was developed for the market by NOVAMED S.L. (Murcia, Spain). For bud wood availability, please contact NOVAMED PEACH SL.

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