SOIUL DE CIREŞ BOAMBE DE COTNARI ŞI DESCENDENŢII ACESTUIA
'BOAMBE DE COTNARI' SWEET CHERRY CULTIVAR AND THEIR DESCENDANTS

Sorina Sîrbu, Elena Iurea, Margareta Corneanu
Research Station for Fruit Growing Iaşi, Romania

Abstract

'Boambe de Cotnari' is the most appreciated and the most widespread sweet cherry cultivar of the North - Eastern area of Romania. Therefore, in the breeding sweet cherry programs from Romania is often used as maternal or paternal genitor. As a result of improvement works from the period 1982-2000, were obtained 24 new sweet cherry cultivars at Fruit Growing Research Station Iasi, Romania. This paper analyzed 12 sweet cherry cultivars ('Cetăţuia', 'Ancuţa', 'Golia', 'Cătălina', 'Bucium', 'Iaşirom', 'Stefan', 'Sârca', 'Radu', 'Cociu', 'Ludovic' and 'Andrei'), which are all descended from 'Boambe de Cotnari'.

Cuvinte cheie: ameliorare, hibrid, genitori, greutate fruct, crăparea fructului
Keywords: breeding, hybrid, genitors, fruit mass, fruit cracking

1. Introduction

In recent years there have been created, many new sweet cherry cultivars in countries with tradition in this culture(Millan & Charlot, 2005). Worldwide are often included as parents in controlled hybridization cultivars as 'Stella', 'Van', 'Germersdorf', 'Bigarreau Burlat', 'Hedelfingen', 'Bigarreau Drogan' (Apostol, 2008; Zhivondov, 2008; Iurea et al., 2012) with the addition of some local cultivars. Romania constantly occupies six or seven place in the world in production of sweet cherries, the eastern part of the country holding the weight in this species (Statistical Yearbook, 2008). 'Boambe de Cotnari' is a cultivar obtained by selection of a local population from Cotnari - Iasi (Budan & Grădinariu, 2000) which appears in the range of sweet cherry in the 60's with widespread zonal very appreciated by producer for high productive potential and by consumers too for the quality of the fruits. In over 30 years of existence of Research Station for Fruit Growing Iasi, breeding works had as main objective the replacement of inferior cultivars with other new cultivars, with high quality of the fruits, created in Romania or introduced from the foreign countries from entire global range (Corneanu, 2007). Sweet cherry genetic improvement program grew with the establishment of The National Collection of Sweet Cherry Iasi in 1981. In the breeding work was often used 'Boambe de Cotnari' as maternal or paternal genitor. As result of this work, was obtained 24 new sweet cherry cultivars obtained in Iasi and 12 of them have as genitor 'Boambe de Cotnari' presented in this paper.

2. Material and methods

The research method was simple intraspecific hybridization and was made since 1980. Obtained hybrids were grafted on mahaleb and planted at distance of 5x4m in comparative culture. The tillage applied system was the sweet cherry crop specific and trees were taken as free palmetto without support, irrigation or cover system. From selected hybrids during 1999-2010 were obtained cultivars as Cetăţuia', 'Ancuţa', 'Golia', 'Cătălina', 'Bucium', 'Iaşirom', 'Stefan', 'Sârca', 'Radu', 'Cociu', 'Ludovic' and 'Andrei' studied with 'Boambe de Cotnari'.

We made determination on samples with 15 fruits in four repetitions for fruit mass (g) and stones mass (dried at room temperature), using a precision analytical balance (Radwag, readability 0.01 g). Based on these determinations was calculated the fruit/stone ratio. Equatorial diameter of the fruit was determined by measurement of 15 fruits (mm) in four repetitions of the diameter in two directions, using a digital caliper. Soluble solids content (RSC) was determined with refractometrical method using a hand refractometer Zeiss.

Results were statistically analysed using Duncan's test at significance level of α=0.05.

3. Results and discussions

'Boambe de Cotnari' was used as genitor in 72 combinations since 1980 being currently one of the most popular cultivars in the breeding works from Research Station for Fruit Growing Iasi, Romania. Following these works since 1999 were obtained first approval cultivars, achieving a total of

12 new sweet cherry cultivars with 'Boambe de Cotnari' as maternal or paternal genitor (Table 1, Figure 1).

Equatorial diameter of fruit ranged from 18.05 mm ('Cetăţuia') and 24.67 mm ('Ludovic'), without statistically significant differences between cultivars. In terms of commercial cultivars of 'Boambe de Cotnari', 'Marina', 'Golia', 'Catalina', 'Bucium', 'Ştefan, 'Oana', 'Cociu', 'Ludovic' and 'Andrei' having perspective as cultivars of fruit size over 21 mm, a necessary condition for export production delivery (***, 2007). 'Ludovic' and 'Andrei' are valuable cultivars by registering the small seed percentage (table 3).

Compared with 'Boambe de Cotnari' used as genitor, the sweet cherry studied cultivars were more resistant at fruit cracking, the most valuable being 'Andrei' (1.13%) (figure 4), 'Ludovic' (1.73%) (figure 3) and 'Cociu' (1.9%) (figure 2, table 3).

Content of soluble solids determined by refractometrical method registered values between 15.01% ('Radu') and 19.53 % ('Ştefan') without significant differences between cultivars in statistical terms.

4. Conclusions

'Boambe de Cotnari' is very valuable in breeding sweet cherry works, being a medium vigor tree, with high productivity, good quality of fruits and high resistance to stress factors, these characters being transmitted to descendants, improved as result of combinations with other valuable genitors.

From combinations made during 1982-1989 with 'Boambe de Cotnari' as parent, 12 sweet cherry hybrids were selected, which have been approved as cultivars between 1999 to 2010: 'Cetăţuia', 'Catalina', 'Golia', 'Marina', 'Bucium', 'Iaşirom', 'Stefan', 'Oana', 'Radu', 'Cociu', 'Ludovic' and 'Andrei'.

New sweet cherry cultivars were noted by:

- Early ripening time: 'Cetăţuia', 'Cătălina';
- Late ripening time: 'Marina';
- Productivity and high fruit quality : 'Golia', 'Bucium', 'Iaşirom', 'Ştefan', 'Cociu', 'Ludovic' and 'Andrei'.
- Resistance to stress factors: 'Oana' and 'Radu'.

References

1. Apostol, 2008. New Sweet and Sour Cherry Selections in Hungary, Proc. 5th International Cherry Symposium, Acta Hort. 795, p. 93-96.
2. Budan S., Grădinariu G., 2000. Cireşul, Edit. 'Ion Ionescu de la Brad', Iaşi, 262 pp.
3. Cociu V., Oprea Şt., 1989. Metode de cercetare în ameliorarea plantelor pomicole, Edit. Dacia, Cluj-Napoca, 173 pp.
4. Corneanu G. (coord.), 2007. Staţiunea de Cercetare Dezvoltare pentru Pomicultură Iaşi la 30 de ani de activitate (1977-2007), Editura Altfel, 233 pp.
5. Iurea Elena, Grădinariu G., Corneanu G., Sîrbu Sorina, Pandele A., 2012. The sweet cherry tree cultivar 'Van' and its descendants, Lucr. st. UŞAMV Iaşi, Seria Horticultură, vol. 55, p. 207-212.
6. Millan Muriel, Charlot G., 2005. Nouvelles variétés de cerise. Une gamme large et prometteuse, Infos-Ctifl, n. 210, p. 12-15.
7. Zhivondov, A., 2008. Some results of using 'Van' cultivar for the improvement of the sweet cherry range of cultivars in Bulgaria, Proc. 5th International Cherry Symposium, Acta Hort. 795, p. 93-96.
8. www.cpvo.europa.eu. Protocol for Distinctness, Uniformity and Stability Tests of Sweet Cherry (*Prunus avium* L.).
9. ***, 2007. Unece Standard FFV-13 concerning the marketing and commercial quality control of cherries, New York, Geneva, 7 p.
10. ***, 2008. Anuarul statistic, available on-line at http://www.insse.ro/

Tables and figures

Table 1. Use of 'Boambe de Cotnari' in sweet cherry breeding program at the Fruit Growing Research Station Iasi-Romania, during 1980-2010

Period	Number of combinations which had 'Boambe de Cotnari' as genitor:			Pollinated flowers	Obtained fruits	Hybrid seeds	Approval cultivars
	♀	♂	Total				
1980-1990	60	12	72	63,729	10,386	7,323	-
1991-2000	11	17	28	34,382	6,618	3,780	1
2001-2010	8	0	8	8,085	2,209	1,523	11

Table 2. New sweet cherry cultivars obtained using 'Boambe de Cotnari' as genitor

Cultivar	Year of hybridization	Genitors		Year of approval / patenting
		♀	♂	
Marina (sin. Ancuţa)	1982	Boambe de Cotnari	HC 23/31	2001/2008
Cetăţuia	1984	Van	Boambe de Cotnari	1999/2008
Golia	1984	Van	Boambe de Cotnari	2001/2008
Cătălina	1984	Van	Boambe de Cotnari	2001/2008
Bucium	1984	Van	Boambe de Cotnari	2006/2008
Iaşirom	1984	Van	Boambe de Cotnari	2006/2008
Ştefan	1984	Van	Boambe de Cotnari	2006/2008
Oana (sin. Sârca)	1984	Van	Boambe de Cotnari	2007/2010
Radu	1984	Van	Boambe de Cotnari	2007/2012
Ludovic	1984	Van	Boambe de Cotnari	2010
Cociu	1984	Boambe de Cotnari	Bigarreau Moreau	2010
Andrei	1989	HC 27/4	Boambe de Cotnari	2010

Table 3. Characteristics of sweet cherry cultivars descended from 'Boambe de Cotnari' (average 2010-2013, n = 4)

Cultivar	Fruit mass (g)*	Fruit length H (mm)	Fruit width D (mm)	Fruit thickness d (mm)	Fruit pedicel length (mm)	Pit-to-fruit ratio (%)	Fruit cracking (%)	Soluble solids content %
Boambe de Cotnari	7.15^{bc}	20.38^{a}	21.23^{a}	19.23^{a}	39.45^{abc}	5.08^{a}	44^{a}	16.15^{a}
Cetăţuia	3.82^{d}	14.99^{a}	18.05^{a}	15.98^{a}	23.38^{g}	4.2^{d}	42.75^{a}	16.95^{a}
Marina (sin. Ancuta)	7.12^{bc}	20.24^{a}	22.37^{a}	18.55^{a}	44.1^{a}	4.05^{de}	32.78^{a}	15.42^{a}
Golia	6.52^{bc}	19.79^{a}	21.83^{a}	18.68^{a}	35.67^{bcde}	3.76^{fg}	25.8^{a}	17.2^{a}
Cătălina	6.51^{bcd}	20.05^{a}	22.07^{a}	19.27^{a}	32.03^{def}	4.5^{def}	24.45^{a}	17.16^{a}
Bucium	7.17^{b}	20.76^{a}	22.65^{a}	19.44^{a}	39.35^{abc}	3.9^{ef}	22.7^{a}	15.36^{a}
Iaşirom	5.68^{bcd}	18.96^{a}	20.27^{a}	17.16^{a}	31.77^{def}	3.75^{fg}	10.75^{a}	18.78^{a}
Ştefan	7.1^{bc}	21.06^{a}	22.39^{a}	19.21^{a}	37.63^{abcd}	3.7^{g}	5.4^{a}	19.53^{a}
Oana (sin. Sârca)	6.37^{bcd}	19.34^{a}	21.53^{a}	18.26^{a}	30.3^{ef}	4.51^{bc}	4.1^{a}	16.89^{a}
Radu	5.17^{d}	17.85^{a}	19.94^{a}	17.19^{a}	27.63^{fg}	4.93^{a}	3.95^{a}	15.01^{a}
Cociu	8.21^{a}	20.81^{a}	23.89^{a}	20.32^{a}	39.9^{ab}	3.71^{g}	1.9^{a}	15.21^{a}
Ludovic	9.04^{a}	22.09^{a}	24.67^{a}	20.56^{a}	33.89^{bcdef}	3.15^{h}	1.73^{a}	15.91^{a}
Andrei	9.29^{a}	23.4^{a}	24.53^{a}	21.05^{a}	33.05^{cdef}	3.31^{h}	1.13^{a}	17.95^{a}
LSD%	1.56	7.95	9.15	7.23	5.91	0.17	60.31	5.05

* - Different letters after the numbers correspond with statistically significant differences for P ≤5% - of *Duncan's multiple range* test.

Fig. 1. 'Boambe de Cotnari'

Fig. 2. 'Cociu'

Fig. 3. 'Ludovic'

Fig. 4. 'Andrei'