

Characterization of traditional sweet cherry cultivars from south-eastern Italy



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Italy ranks at the fourth place for sweet cherry production in the world, and Apulia region, located in south-eastern Italy is by far the leading producer at the national level.

The cultivation of sweet cherry in Apulia dates back to several centuries ago, and also for this reason, a wide range of traditional local varieties have been selected and grown by farmers in this area.



In the present contribution, the genetic diversity of 21 Apulian sweet cherry cultivars was investigated using phenotypical characterization and evaluation in combination with molecular marker analysis. A number of phenological, agronomic and pomological observations were performed on each cultivar. Particularly, we scored data on blooming time, ripening time, productivity, fruit size, flesh firmness.

A wide variation was observed in several traits, especially in flowering and ripening time, productivity, fruit size, and flesh firmness.

The same varieties were genotyped at 13 microsatellite loci in order to detect genetic variation and assess phylogenetic relationships. They displayed a high level of diversity among varieties.

CULTIVAR	FLOWERING TIME	RIPENING TIME
Palombara	25 March - 10 April	25 April - 05 May
Fuciletta primizia	10 March - 31 March	01 May - 10 May
S.Nicola	25 March - 10 April	25 April - 05 May
Cavaliera	05 April - 20 April	10 May - 25 May
Francesina	25 March - 07 April	15 May - 20 May
Francia	25 March - 07 April	10 May - 15 May
Bella di Firenze	10 April - 15 April	15 May - 20 May
Capo serpe	15 April - 20 April	15 May - 20 May
Del Reddito	25 March - 10 April	20 May - 25 May
Fuciletta nostrale	25 March - 10 April	20 May - 25 May
Zuccaro	10 April - 20 April	15 May - 25 May
Durone Bisceglie	20 March - 31 March	25 May - 06 June
Forli	10 April - 20 April	25 May - 06 June
Molfetta	05 April - 15 April	25 May - 06 June
Pagliarsa	05 April - 15 April	25 May - 06 June
Colafermina	05 April - 15 April	01 June - 10 June
Roma	05 April - 20 April	01 June - 10 June
Ferrovia	10 April - 20 April	05 June - 15 June
Limone	10 April - 20 April	05 June - 15 June
Laffiona	20 April - 05 May	15 June - 25 June
Montagnola	25 March - 10 April	15 June - 25 June



Locus	Sample Size	na*
UCDCH09	126	4.00
UCDCH12	126	8.00
UCDCH18	126	4.00
UCDCH21	126	6.00
UCDCH31	120	6.00
UCDCH36	126	3.00
UPD95005	126	4.00
UPD97402	126	8.00
UPD98022	126	4.00
UPD98412	126	2.00
AMPA113	126	4.00
AMPA115	126	3.00
CPDCT22	126	7.00
Mean	126	4.85
St. Dev		1.95

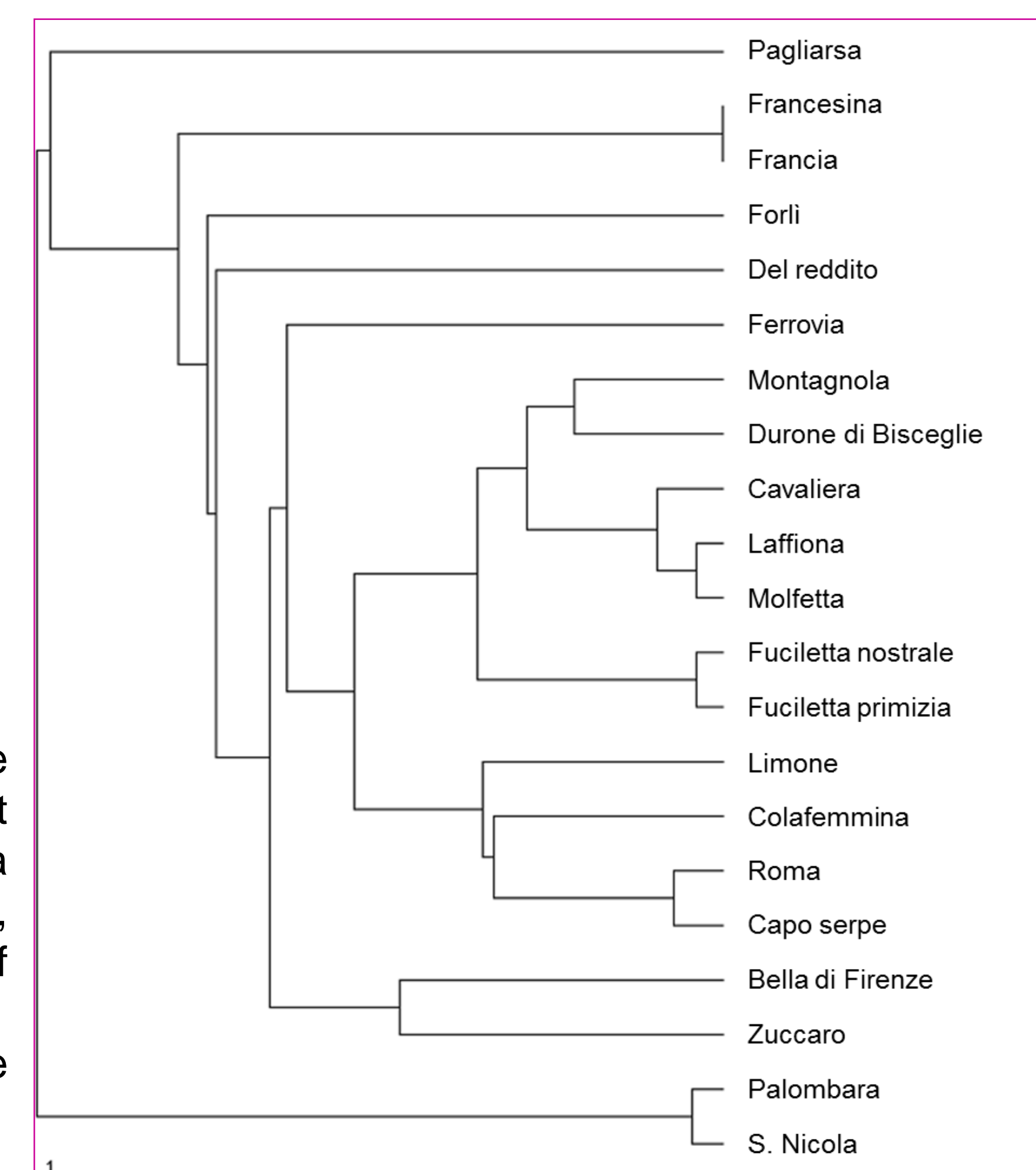
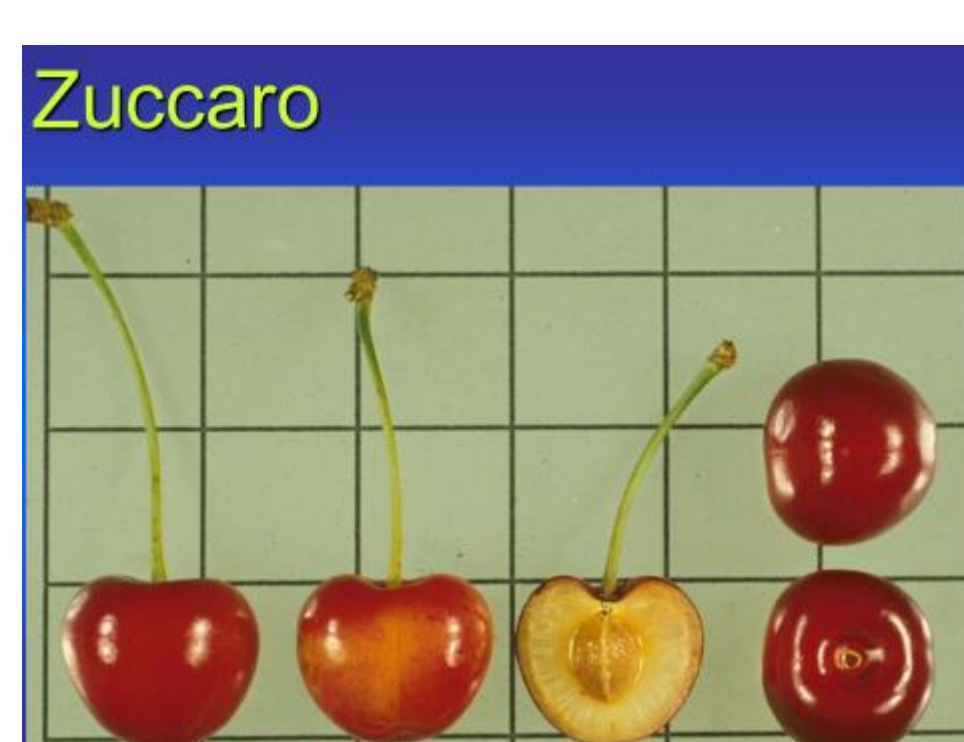
*na = Observed number of alleles

Number of alleles at each locus analysed



Pop ID	Fra.ina	Fra.	Fer.	For.	Mon.	Rom.	Cav.	Pagl.	Bel.Fi	Cap.S	Col.	D.red.	Dur.Bi.	Fuc.n	Fuc.p	Laf.	Lim.	Molf.	Pal.	S.Nic.	Zuc.	
Francesina	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Francia	0.000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ferrovia	1.073	1.073	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Forli	0.844	0.844	0.556	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Montagnola	0.572	0.572	0.485	0.687	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Roma	0.666	0.666	0.519	0.306	0.458	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Cavaliera	0.475	0.475	0.519	0.634	0.202	0.448	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Pagliarsa	0.874	0.874	0.637	0.606	0.969	0.847	0.722	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Bella di FI	0.642	0.642	0.459	0.507	0.773	0.392	0.566	0.491	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Capo Serpe	0.747	0.747	0.459	0.374	0.367	0.055	0.432	0.874	0.459	—	—	—	—	—	—	—	—	—	—	—	—	—
Colafermina	0.546	0.546	0.459	0.556	0.331	0.278	0.209	0.749	0.305	0.236	—	—	—	—	—	—	—	—	—	—	—	—
Del reddito	0.747	0.747	0.546	0.661	0.719	0.666	0.519	1.017	0.546	0.693	0.642	—	—	—	—	—	—	—	—	—	—	—
Durone Bisc.	0.502	0.502	0.379	0.556	0.167	0.519	0.243	0.692	0.642	0.546	0.419	0.593	—	—	—	—	—	—	—	—	—	—
Fuciletta nostr.	0.491	0.491	0.404	0.552	0.389	0.464	0.223	0.693	0.537	0.404	0.404	0.404	0.250	—	—	—	—	—	—	—	—	—
Fuciletta prim.	0.491	0.491	0.404	0.552	0.349	0.464	0.223	0.693	0.537	0.636	0.363	0.404	0.286	0.030	—	—	—	—	—	—	—	—
Laffiona	0.404	0.404	0.692	0.723	0.240	0.510	0.089	0.693	0.637	0.491	0.250	0.586	0.215	0.268	0.268	—	—	—	—	—	—	—
Limone	0.777	0.777	0.475	0.634	0.501	0.288	0.325	0.722	0.392	0.213	0.278	0.666	0.615	0.377	0.419	0.377	—	—	—	—	—	—
Molfetta	0.404	0.404	0.586	0.663	0.206	0.464	0.058	0.693	0.586	0.446	0.250	0.491	0.215	0.268	0.230	0.030	0.377	—	—	—	—	—
Palombara	0.777	0.777	0.777	0.834	0.802	0.685	0.819	0.790	0.652	0.777	0.920	0.712	0.777	0.721	0.790	0.721	0.625	0.721	—	—	—	—
S. Nicola	0.811	0.811	0.811	0.868	0.712	0.720	0.784	0.825	0.686	0.811	0.880	0.747	0.811	0.756	0.825	0.691	0.659	0.691	0.34	—	—	—
Zuccaro	0.403	0.403	0.809	0.723	0.430	0.510	0.419	0.754	0.363	0.586	0.363	0.491	0.491	0.531	0.482	0.348	0.610	0.348	0.864	0.825	—	—

Pairwise Nei's genetic distances



Francia and Francesina shared the same alleles at the 13 loci; this high level of similarity can be explained considering their origin and diffusion in the same area (South-East of Bari), even though slight pheno-pomological differences can be observed; the same is true also for Fuciletta nostrale and Fuciletta primizia. For other similar varieties, although more marked morpho-physiological differences are present, it can be hypothesized that a more or less tight relationship can exist, considering that the area of distribution is quite limited.

On the other hand, the more distantly related varieties could have possibly been introduced from outside the Apulia Region.

With their high degree of genetic variation, the traditional sweet cherry germplasm from southern Italy could provide interesting material to obtain new varieties carrying desired improved traits.