Table S1. Microsatellite (simple sequence repeats – SSR) code, DNA sequences, annealing temperatures, fluorescence labels and references among 15 primer pairs used for genotyping of 671 apple embryos, the mother cultivars, and potential pollinizers.

SSR name	Forward primer	Reverse primer	Annealing temperatures	Fluorescence labels	Reference
MIX1					
CH02B10	CAAGGAAATCATCAAAGATTCAAG	CAAGTGGCTTCGGATAGTTG		6-FAM	1
CH05E03	CGAATATTTTCACTCTGACTGGG	CAAGTTGTTGTACTGCTCCGAC	51°C	HEX	2
CH02C02a	CTTCAAGTTCAGCATCAAGACAA	TAGGGCACACTTGCTGGTC		TAMRA	2
MIX2					
CH03D12	GCCCAGAAGCAATAAGTAAACC	ATTGCTCCATGCATAAAGGG		HEX	2
CH02C11	TGAAGGCAATCACTCTGTGC	TTCCGAGAATCCTCTTCGAC	51°C	HEX	2
CH01D03	CCACTTGGCAATGACTCCTC	ACCTTACCGCCAATGTGAAG		TAMRA	2
MIX3					
CH01F07a	CCCTACACAGTTTCTCAACCC	CGTTTTTGGAGCGTAGGAAC		6-FAM	2
CH04E03	TTGAAGATGTTTGGCTGTGC	TGCATGTCTGTCTCCTCCAT	51°C	HEX	2
CH01D09	CCCTTCATTCACATTTCCAG	GCCATCTGAACAGAATGTGC		TAMRA	2
MIX4					
CH01H01	GAAAGACTTGCAGTGGGAGC	GGAGTGGGTTTGAGAAGGTT		6-FAM	1
CH01H02	AGAGCTTCGAGCTTCGTTTG	ATCTTTTGGTGCTCCCACAC	61°C (-0.5°C/cycle) x 6; 61°C x 24	6-FAM	1
CH01H10	TGCAAAGATAGGTAGATATATGCCA	AGGAGGGATTGTTTGTGCAC		HEX	1
MIX5					
CH02C02b	TGCATGCATGGAAACGAC	TGGAAAAAGTCACACTGCTCC		6-FAM	2
CH04E02	GGCGATGACTACCAGGAAAA	ATGTAGCCAAGCCAGCGTAT	65°C (-1°C/cycle) x 4; 62°C x 29	HEX	2
CH02D08	TCCAAAATGGCGTACCTCTC	GCAGACACTCACTCACTATCTCTC		TAMRA	2

1 Gianfranceschi et al. (1998)

2 Liebhard et al. (2002)

Table S2. Number of alleles per locus (Na) and gene diversity (He) (Nei, 1978) for the 11 main apple cultivars ('Asfari', 'Aroma', 'Discovery', 'Eden', 'Elstar', 'Fryd', 'Julyred', 'Katja', 'Rubinstep', 'Summerred' and 'Vista Bella') and crabapples ('Dolgo', 'Evereste', 'Golden Hornet', 'Ko Benza', 'Professor Sprengler' and 'Red Sentinel'), as well for embryos, collected from the main cultivars in 2021 and 2022, based on 15 SSR (simple sequence repeat) loci. The cultivar 'Gravenstein' was excluded due to its triploid state.

		CH02C02b	CH04E02	CH02D08	CH03D12	CH02C11	CH01D03	CH01H01	CH01H02	CH01H10	CH01F07a	CH04E03	CH01D09	CH02B10	CH05E03	CH02C02a	Mean
Main cv. and crabapples	Na	4	7	8	15	11	12	10	7	11	10	12	14	11	17	9	10.53
	Na'21	2	2	3	3	3	3	4	2	4	3	4	4	4	4	3	3.20
'Asfari'	Na'22	2	2	5	3	3	3	5	2	5	3	4	3	4	4	2	3.33
	Na'21	2	3	5	5	7	4	5	3	5	6	6	4	6	5	5	4.73
'Aroma'	Na'22	2	4	5	5	6	3	4	4	5	5	6	3	5	4	4	4.33
	Na'21	2	5	5	7	6	6	6	4	6	8	7	7	5	9	6	5.93
'Discovery'	Na'22	2	4	5	3	5	4	5	3	5	4	5	5	4	5	3	4.13
	Na'21	2	5	5	6	6	5	6	4	3	6	5	6	4	7	3	4.87
'Eden'	Na'22	2	5	4	6	7	4	4	3	4	5	4	6	3	5	2	4.27
	Na'21	2	3	5	4	5	3	5	3	6	4	5	5	6	6	4	4.40
'Elstar'	Na'22	2	4	4	5	6	3	5	3	7	5	5	5	6	6	3	4.60
	Na'21	3	5	4	7	8	4	5	3	3	6	5	7	4	7	2	4.87
'Fryd'	Na'22	2	6	4	7	8	4	6	4	5	5	4	7	5	6	4	5.13
	Na'21	3	4	6	5	7	4	5	5	6	5	7	4	6	3	4	4.93
'Julyred'	Na'22	2	3	4	3	4	2	4	3	4	4	5	4	4	3	3	3.47
	Na'21	2	4	3	3	4	2	4	2	4	4	4	4	4	4	3	3.40
'Katja'	Na'22	2	4	6	2	6	3	5	3	6	3	5	4	3	4	3	3.93
	Na'21	3	5	6	10	9	7	7	5	9	6	10	8	7	10	5	7.13
'Rubinstep'	Na'22	3	4	5	5	7	6	7	4	10	6	6	6	7	8	5	5.93
	Na'21	3	5	9	9	9	7	7	5	7	7	9	7	6	10	6	7.07
'Summerred'	Na'22	3	4	7	5	8	6	7	4	7	5	8	4	7	11	5	6.07
	Na'21	2	5	4	6	7	4	5	3	6	6	6	4	6	8	3	5.00
'Vista Bella'	Na'22	2	5	4	4	7	3	6	2	6	6	6	4	5	8	5	4.87

Table S1. continued.

		CH02C02b	CH04E02	CH02D08	CH03D12	CH02C11	CH01D03	CH01H01	CH01H02	CH01H10	CH01F07a	CH04E03	CH01D09	CH02B10	CH05E03	CH02C02a	Mean
Main cv. and crabapples	He	0.58	0.59	0.82	0.86	0.88	0.88	0.84	0.64	0.80	0.84	0.86	0.86	0.80	0.91	0.74	0.79
	He'21	0.50	0.26	0.60	0.62	0.61	0.57	0.72	0.36	0.71	0.65	0.71	0.64	0.65	0.64	0.46	0.58
'Asfari'	He'22	0.50	0.35	0.69	0.58	0.60	0.52	0.75	0.26	0.76	0.64	0.74	0.57	0.74	0.74	0.03	0.56
	He'21	0.44	0.35	0.68	0.68	0.79	0.61	0.72	0.49	0.62	0.76	0.73	0.66	0.74	0.66	0.69	0.64
'Aroma'	He'22	0.41	0.57	0.74	0.78	0.81	0.57	0.70	0.68	0.75	0.78	0.80	0.53	0.77	0.65	0.68	0.68
	He'21	0.23	0.65	0.77	0.74	0.78	0.58	0.72	0.58	0.75	0.74	0.78	0.73	0.68	0.78	0.68	0.68
'Discovery'	He'22	0.03	0.66	0.75	0.61	0.72	0.55	0.76	0.51	0.71	0.64	0.75	0.70	0.60	0.70	0.52	0.61
	He'21	0.50	0.76	0.66	0.70	0.65	0.41	0.60	0.58	0.51	0.73	0.68	0.75	0.52	0.72	0.51	0.62
'Eden'	He'22	0.48	0.76	0.65	0.79	0.67	0.60	0.56	0.53	0.56	0.70	0.71	0.72	0.53	0.67	0.50	0.63
	He'21	0.50	0.45	0.70	0.60	0.78	0.57	0.71	0.40	0.67	0.64	0.68	0.68	0.68	0.73	0.61	0.63
'Elstar'	He'22	0.50	0.26	0.65	0.58	0.76	0.53	0.75	0.38	0.71	0.65	0.74	0.73	0.68	0.77	0.55	0.62
	He'21	0.47	0.72	0.68	0.77	0.68	0.33	0.70	0.46	0.50	0.65	0.62	0.76	0.45	0.71	0.50	0.60
'Fryd'	He'22	0.48	0.70	0.66	0.78	0.74	0.21	0.69	0.57	0.62	0.57	0.68	0.80	0.60	0.62	0.49	0.61
	He'21	0.52	0.42	0.70	0.65	0.80	0.58	0.70	0.69	0.62	0.78	0.79	0.60	0.74	0.58	0.59	0.65
'Julyred'	He'22	0.50	0.38	0.68	0.52	0.64	0.50	0.64	0.61	0.56	0.75	0.76	0.62	0.63	0.52	0.52	0.59
	He'21	0.50	0.61	0.57	0.56	0.54	0.44	0.67	0.46	0.61	0.63	0.61	0.66	0.65	0.66	0.43	0.57
'Katja'	He'22	0.50	0.64	0.67	0.50	0.60	0.37	0.70	0.43	0.64	0.58	0.67	0.64	0.65	0.66	0.43	0.58
	He'21	0.27	0.63	0.77	0.54	0.75	0.65	0.80	0.43	0.47	0.73	0.58	0.55	0.49	0.81	0.65	0.61
'Rubinstep'	He'22	0.18	0.53	0.72	0.37	0.70	0.64	0.76	0.45	0.55	0.73	0.57	0.64	0.63	0.76	0.70	0.60
	He'21	0.51	0.56	0.81	0.77	0.82	0.67	0.72	0.66	0.72	0.74	0.78	0.74	0.70	0.83	0.66	0.71
'Summerred'	He'22	0.51	0.47	0.78	0.67	0.81	0.53	0.78	0.67	0.65	0.73	0.81	0.62	0.51	0.82	0.67	0.67
	He'21	0.44	0.68	0.61	0.56	0.75	0.64	0.73	0.52	0.74	0.78	0.68	0.44	0.56	0.81	0.52	0.63
'Vista Bella'	He'22	0.42	0.61	0.54	0.51	0.75	0.56	0.71	0.48	0.69	0.79	0.64	0.34	0.52	0.78	0.44	0.59