

Evaluation of intra-cultivar variability in *Olea europaea* L. cv. Leccino using morphological, biochemical and molecular markers.

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Table S1. Mean \pm Standard Error and ANOVA analysis of morphological data of Leccino accessions. Values in column with different letters are significantly different by Tukey's test ($P \leq 0.05$), values with NS are not significant. Traits code according to Table S4.

Traits	LE1	LE2	LE3	LE4	LE5	LE6	LE7	LESt	LE8	LE9	LE10	LE11	LE12	LE13	LE14	LE15	Multiple comparison
Plant																	
Lsh	22.8 ^{ab} ± 0.22	23.6 ^{ab} ± 0.11	23.5 ^{ab} ± 0.52	23.4 ^{ab} ± 0.72	22.6 ^{ab} ± 0.53	23.6 ^{ab} ± 0.22	22.5 ^{ab} ± 0.40	24.7 ^a ± 0.30	23.5 ^{ab} ± 0.29	24.5 ^a ± 0.70	22.4 ^{ab} ± 0.70	21.8 ^a ± 0.71	23.2 ^{ab} ± 0.67	23.7 ^{ab} ± 0.41	23.5 ^{ab} ± 0.50	23.4 ^{ab} ± 0.63	LE11#LESt-LE9
NNSh	10 ^{ns} ± 0.35	10 ^{ns} ± 0.11	10 ^{ns} ± 0.19	11 ^{ns} ± 0.30	10 ^{ns} ± 0.33	10 ^{ns} ± 0.18	10 ^{ns} ± 0.23	11 ^{ns} ± 0.17	10 ^{ns} ± 0.11	11 ^{ns} ± 0.23	10 ^{ns} ± 0.3	10 ^{ns} ± 0.29	10 ^{ns} ± 0.37	11 ^{ns} ± 0.12	11 ^{ns} ± 0.12	11 ^{ns} ± 0.30	-
ILSh	2.28 ^{ns} ± 0.09	2.36 ^{ns} ± 0.02	2.35 ^{ns} ± 0.05	2.13 ^{ns} ± 0.14	2.26 ^{ns} ± 0.12	2.36 ^{ns} ± 0.05	2.25 ^{ns} ± 0.05	2.24 ^{ns} ± 0.07	2.35 ^{ns} ± 0.03	2.23 ^{ns} ± 0.08	2.24 ^{ns} ± 0.11	2.18 ^{ns} ± 0.12	2.32 ^{ns} ± 0.12	2.15 ^{ns} ± 0.05	2.13 ^{ns} ± 0.10	2.13 ^{ns} ± 0.10	-
Fruit																	
Frl	2.02 ^{ab} ± 0.03	1.85 ^{ab} ± 0.04	1.86 ^{ab} ± 0.07	1.88 ^{ab} ± 0.06	1.93 ^{ab} ± 0.03	1.92 ^{ab} ± 0.05	1.93 ^{ab} ± 0.06	1.94 ^{ab} ± 0.03	1.86 ^{ab} ± 0.04	2.04 ^a ± 0.05	1.78 ^b ± 0.04	2.00 ^{ab} ± 0.04	2.03 ^{ab} ± 0.05	1.92 ^{ab} ± 0.07	2.03 ^{ab} ± 0.06	2.05 ^a ± 0.04	LE10#LE15-LE9
FrW	1.41 ^{ns} ± 0.02	1.38 ^{ns} ± 0.02	1.39 ^{ns} ± 0.04	1.38 ^{ns} ± 0.03	1.40 ^{ns} ± 0.04	1.43 ^{ns} ± 0.04	1.42 ^{ns} ± 0.03	1.42 ^{ns} ± 0.03	1.41 ^{ns} ± 0.01	1.49 ^{ns} ± 0.04	1.39 ^{ns} ± 0.02	1.46 ^{ns} ± 0.04	1.49 ^{ns} ± 0.05	1.46 ^{ns} ± 0.03	1.43 ^{ns} ± 0.04	1.51 ^{ns} ± 0.03	-
Frl/FW ratio	1.43 ^{ns} ± 0.01	1.34 ^a ± 0.02	1.33 ^a ± 0.03	1.36 ^a ± 0.02	1.39 ^{ns} ± 0.02	1.34 ^{ab} ± 0.03	1.36 ^{ns} ± 0.02	1.37 ^{ns} ± 0.03	1.32 ^{ns} ± 0.01	1.37 ^{ns} ± 0.02	1.28 ^b ± 0.02	1.37 ^{ns} ± 0.03	1.36 ^{ns} ± 0.02	1.31 ^a ± 0.03	1.42 ^{ns} ± 0.02	1.36 ^{ns} ± 0.04	LE15#LE10-LE13
FrFW	2.41 ^{ns} ± 0.09	2.03 ^b ± 0.08	2.23 ^{ns} ± 0.14	2.10 ^b ± 0.15	2.33 ^{ns} ± 0.11	2.26 ^{ns} ± 0.17	2.44 ^{ns} ± 0.17	2.32 ^{ns} ± 0.10	2.22 ^{ns} ± 0.09	2.55 ^{ns} ± 0.10	2.04 ^b ± 0.08	2.58 ^{ns} ± 0.16	2.75 ^a ± 0.16	2.56 ^{ns} ± 0.12	2.60 ^{ns} ± 0.16	2.72 ^a ± 0.15	LE2-LE10#LE12-LE15
Fr/P ratio	4.87 ^{ns} ± 0.3	5.52 ^{ns} ± 0.4	5.94 ^{ns} ± 0.2	5.37 ^{ns} ± 0.4	5.48 ^{ns} ± 0.4	5.53 ^{ns} ± 0.4	5.82 ^{ns} ± 0.4	5.33 ^{ns} ± 0.3	5.55 ^{ns} ± 0.4	6.21 ^{ns} ± 0.4	5.76 ^{ns} ± 0.2	5.81 ^{ns} ± 0.4	6.03 ^{ns} ± 0.4	5.93 ^{ns} ± 0.3	5.22 ^{ns} ± 0.3	6.54 ^{ns} ± 0.3	-

Table S1. continued

Traits	LE1	LE2	LE3	LE4	LE5	LE6	LE7	LESt	LE8	LE9	LE10	LE11	LE12	LE13	LE14	LE15	Multiple comparison
Pit																	
PL	1.48 ^{abc} ±0.04	1.36 ^{bc} ±0.03	1.38 ^{abc} ±0.06	1.39 ^{abc} ±0.04	1.40 ^{abc} ±0.04	1.38 ^{abc} ±0.05	1.42 ^{abc} ±0.04	1.45 ^{1c} ±0.03	1.35 ¹ ±0.04	1.45 ^{1c} 0.04±	1.32 ² ±0.03	1.43 ^{abc} ±0.03	1.46 ^{abc} ±0.02	1.42 ^{abc} ±0.05	1.52 ^{ab} ±0.03	1.53 ¹ ±0.03	LE8-LE10≠LE15
PW	0.71 ^{ns} ±0.08	0.68 ^{ns} ±0.06	0.71 ^{ns} ±0.10	0.66 ^{ns} ±0.10	0.68 ^{ns} ±0.09	0.72 ^{ns} ±0.09	0.69 ^{ns} ±0.07	0.70 ^{ns} ±0.06	0.68 ^{ns} ±0.08	0.71 ^{ns} ±0.07	0.69 ^{ns} ±0.10	0.71 ^{ns} ±0.06	0.71 ^{ns} ±0.06	0.69 ^{ns} ±0.10	0.73 ^{ns} ±0.05	0.70 ^{ns} ±0.06	-
PL/PW ratio	2.10 ^{ns} ±0.05	2.00 ^{ns} ±0.04	1.99 ^{ns} ±0.09	2.05 ^{ns} ±0.05	2.04 ^{ns} ±0.03	1.98 ^{ns} ±0.06	2.04 ^{ns} ±0.06	2.06 ^{ns} ±0.03	2.00 ^{ns} ±0.04	2.03 ^{ns} ±0.04	1.95 ^{ns} ±0.06	2.00 ^{ns} ±0.03	2.05 ^{ns} ±0.03	2.06 ^{ns} ±0.09	2.08 ^{ns} ±0.04	2.17 ^{ns} ±0.03	-
PFW	0.50 ¹ ±0.02	0.38 ^{ns} ±0.03	0.40 ^{ns} ±0.02	0.38 ^{1c} ±0.03	0.41 ^{abc} ±0.03	0.41 ^{1c} ±0.04	0.42 ^{1c} ±0.04	0.44 ^{1c} ±0.02	0.39 ^{ns} ±0.02	0.44 ^{abc} ±0.03	0.35 ¹ ±0.02	0.45 ^{ab} ±0.04	0.46 ^{ab} ±0.02	0.44 ^{1c} ±0.03	0.45 ^{ab} ±0.02	0.47 ^{ab} ±0.03	LE1≠LE10
NG	10 ^{ns} ±0.3	10 ^{ns} ±0.2	10 ^{ns} ±0.3	10 ^{ns} ±0.2	10 ^{ns} ±0.2	11 ^{ns} ±0.3	10 ^{ns} ±0.2	11 ^{ns} ±0.3	10 ^{ns} ±0.2	11 ^{ns} ±0.2	10 ^{ns} ±0.3	11 ^{ns} ±0.3	10 ^{ns} ±0.2	11 ^{ns} ±0.3	10 ^{ns} ±0.3	11 ^{ns} ±0.2	-
Leaf																	
LL	5.42 ^{ns} ±0.10	5.47 ^{ns} ±0.21	5.48 ^{ns} ±0.24	5.53 ^{ns} ±0.21	5.46 ^{ns} ±0.26	5.45 ^{ns} ±0.24	5.49 ^{ns} ±0.08	5.30 ^{ns} ±0.18	5.20 ^{ns} ±0.24	5.33 ^{ns} ±0.18	5.51 ^{ns} ±0.13	5.50 ^{ns} ±0.21	5.37 ^{ns} ±0.08	5.49 ^{ns} ±0.21	5.47 ^{ns} ±0.18	5.55 ^{ns} ±0.16	-
LW	1.48 ^{abc} ±0.01	1.44 ^{abc} ±0.01	1.48 ^{1c} ±0.01	1.49 ^{abc} ±0.01	1.45 ^{abc} ±0.02	1.44 ^{1c} ±0.01	1.49 ^{1c} ±0.01	1.50 ^{ab} ±0.01	1.44 ^{abc} ±0.009	1.44 ^{1c} ±0.01	1.49 ^{abc} ±0.01	1.47 ^{1c} ±0.01	1.47 ^{1c} ±0.01	1.51 ¹ ±0.01	1.45 ^{1c} ±0.02	1.43 ¹ ±0.01	LE13≠LE15
LL/LW ratio	3.66 ^{ab} ±0.06	3.80 ^{ab} ±0.05	3.71 ^{ns} ±0.09	3.71 ^{ns} ±0.05	3.77 ^{ns} ±0.04	3.79 ^{ns} ±0.07	3.68 ^{ns} ±0.03	3.56 ^{ns} ±0.03	3.62 ^{ns} ±0.06	3.69 ^{ns} ±0.06	3.70 ^{ns} ±0.03	3.75 ^{ns} ±0.08	3.64 ^{ns} ±0.03	3.64 ^{ns} ±0.05	3.77 ^{ns} ±0.05	3.88 ¹ ±0.04	LE15≠LESt
LA	6.31 ^{ns} ±0.10	6.19 ^{ns} ±0.14	6.36 ^{ns} ±0.20	6.48 ^{ns} ±0.11	6.22 ^{ns} ±0.21	6.16 ^{ns} ±0.10	6.17 ^{ns} ±0.10	6.26 ^{ns} ±0.12	5.87 ^{ns} ±0.11	6.05 ^{ns} ±0.09	6.44 ^{ns} ±0.10	6.34 ^{ns} ±0.18	6.32 ^{ns} ±0.05	6.51 ^{ns} ±0.11	6.22 ^{ns} ±0.15	6.22 ^{ns} ±0.12	-
LFW	0.19 ^{ns} ±0.002	0.19 ^{ns} ±0.008	0.18 ^{ns} ±0.01	0.21 ^{ns} ±0.006	0.20 ^{ns} ±0.006	0.21 ^{ns} ±0.01	0.21 ^{ns} ±0.004	0.20 ^{ns} ±0.004	0.20 ^{ns} ±0.005	0.18 ^{ns} ±0.004	0.20 ^{ns} ±0.003	0.20 ^{ns} ±0.006	0.19 ^{ns} ±0.003	0.20 ^{ns} ±0.005	0.19 ^{ns} ±0.007	0.20 ^{ns} ±0.007	-

Table S2. Qualitative morphological characters of leaf, fruit and pit used for characterizing Leccino accessions and abbreviations (Code) used.

Traits	Code	Description
Leaf		
Leaf shape	LSH	Elliptic-lanceolate
Leaf upper page colour	Lcol	Green-gray
Leaf apex angle	Laa	Open
Leaf base angle	Lba	Open
Fruit		
Fruit shape (FrL/FrW)	FrSH	Elliptical
Fruit position of maximum diameter	FrDMax	Central
Fruit shape apex	FrSHa	Rounded
Fruit shape base	FrSHb	Truncated
Fruit epicarp	Frepi	Pruinose
Fruit lenticels	Frlen	Few
Fruit nipple	Frnip	Absent
Fruit symmetry	Frsym	Asymmetric
Fruit color at mature stage	Frcol	Dark-violet
Pit		
Pit shape	PSH	Elliptic
Pit shape apex	PSHa	Rounded
Pit shape base	PSHb	Pointed
Pit mucron	PMUC	Present
Pit surface	Psur	Rugose
Pit symmetry	Psym	Weakly asymmetric

Table S3. Eigenvector, eigenvalues, individual and cumulative percentage of variation explained by the Principal Component in the Leccino accessions. Traits code according to Table S4.

Traits	PC-1	PC-2	PC-3	PC-4
Lsh (cm)	0.01	0.26	-0.10	0.55
NNSh (n.)	0.,12	-0.32	-0.22	-0.07
ILSh (cm)	-0.08	0.42	0.12	0.45
FrL (cm)	0.42	-0.08	0.13	-0.03
FrW (cm)	0.28	-0.15	0.39	0.14
FrL/FrW	0.25	0.08	-0.29	-0.22
FrFW (g)	0.38	-0.12	0.33	0.12
PL (cm)	0.40	-0.05	-0.15	0.06
PW (cm)	0.21	0.06	0.00	0.12
PL/PW	0.32	-0.11	-0.18	-0.01
PFW (g)	0.32	0.04	-0.23	0.03
NG (n.)	0.06	0.10	0.01	0.11
Fl/P ratio	-0.22	-0.38	0.07	0.03
LL (cm)	-0.06	-0.36	-0,21	0.38
LW (cm)	-0.12	0.02	0.27	-0.35
LL/LW	-0.17	-0.49	-0.10	0.29
LA (cm ²)	-0.11	-0.19	-0.07	0.07
LFW (g)	0.03	-0.17	0.57	0.09
PH (m)	-0.27	0.26	-0.02	-0.03
CP (m ²)	-0.31	0.10	-0.02	0.01
AT (cm ²)	-0.32	0.21	0.03	-0.03
FrY (Kg)	-0.23	0.28	-0.03	-0.02
CY (Kg)	-0.33	0.22	-0.00	0.02
CYE (Kg/cm ²)	-0.26	0.31	-0.03	0.03
TYE(Kg/cm ²)	-0.26	0.26	-0.08	-0.09
Eigenvalue	6.64	3.95	2.96	2.50
Single PC %	27.2	16.8	11.8	9.9
Cumulated %	26.6	44.0	55.8	65.7

Table S4. List of analysed morphological traits within Leccino accessions and abbreviations (Code) used.

Traits	Code	Traits	Code
Plant		Fruit length/width ratio	FrL/FrW
Height (m)	PH	Fruit weight (g)	FrFW
Canopy projection to the soil (m ²)	CP	Flesh/pit weight ratio	Fl/P
$2\pi r h$			
Cross-sectional area of trunk (cm ²)	AT	Fruit shape	FrSH
πr^2			
Length of one year old shoots (cm)	Lsh	Fruit position of maximum diameter	FrDMax
Node numbers of (n.)	NNSh	Fruit shape apex	FrSHa
Intermodal length of one year old shoots (cm)	ILSh	Fruit shape base	FrSHb
		Fruit epicarp	Frepi
Yield			
Fruit yield per plant (Kg)	FrY	Fruit lenticels	Frlen
Cumulative production (Kg)	CY	Fruit nipple	Frnip
Production efficiency 1 (Kg/cm ²)	CYE	Fruit symmetry	FrSYM
Production efficiency 2 (Kg/cm ²)	TYE	Fruit color at mature stage	FrCol
Leaf		Pit	
Leaf length (cm)	LL	Pit length (cm)	PL
Leaf width (cm)	LW	Pit width (cm)	PW
Leaf length/width ratio	LL/LW	Pit length/width ratio	PL/PW
Leaf area (cm ²)	LA	Pit fresh weight (g)	PFW
Leaf fresh weight (g)	LFW	Number of grooves (n.)	NG
Leaf shape	LSH	Pit shape	PSH
Leaf upper page colour	Lcol	Pit shape apex	PSHa
Leaf apex angle	LAA	Pit shape base	PSHb
Leaf base angle	LAB	Pit mucron	PMUC
		Pit surface	Psur
Fruit			
Fruit length (cm)	FrL	Pit symmetry	Psym
Fruitwidth (cm)	FrW		

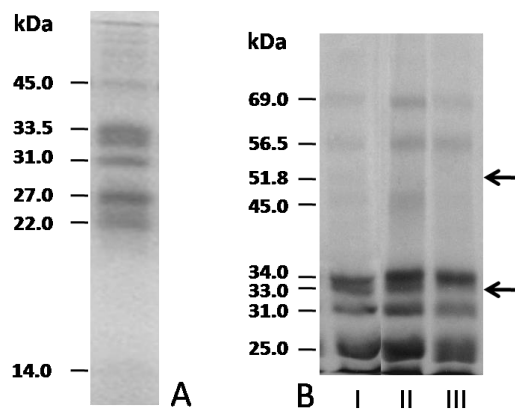


Fig S1. Electrophoretic patterns of the seed proteins in denaturing conditions. SDS-PAGE analysis of seed storage proteins (Fig A) revealed only monomorphic patterns, all bands appearing in all 16 genotypes. An example of the common observed pattern is shown. SDS PAGE analysis of seed tegument proteins (Fig B) revealed monomorphic pattern (all bands appearing as in the accessions of the group I). Polymorphic patterns are due to the absence of one or two bands (as in the genotypes of groups II and III). The positions of the lacking bands have been evidenced in the figure with arrows. The molecular weights of the bands are expressed in kiloDaltons (kDa).

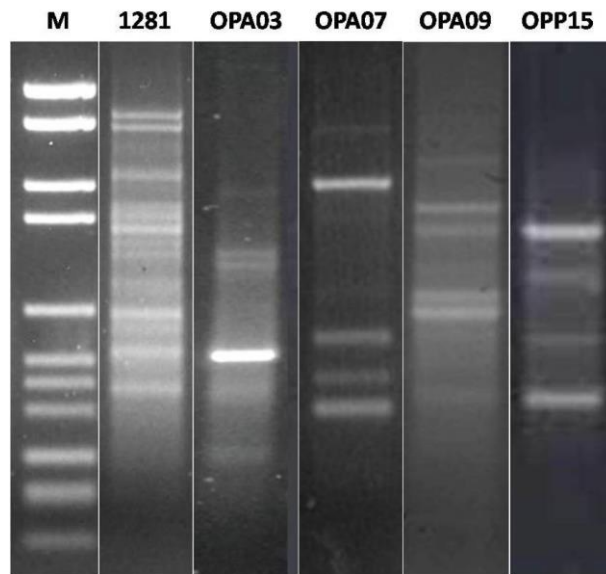


Fig S2. The figure shows examples of 5 out of 30 RAPD profiles analyzed. The primers used for amplification are: 1281, OPA03, OPA07, OPA09, OPP15. M represent the molecular marker VI (Boehringer, Mannheim, Germany) with base pairs (bp). Each lane represents a monomorphic pattern for all 16 accessions.