

Redaelli et al.

Morpho-Phenological, Chemical and Genetic Characterization of Italian Maize Landraces from the Lazio Region

## Supporting information

## TABLES

Table S1. Chemical composition (% dry matter), 1000-seeds weight (g) and kernel type of CREA and ARSIAL accessions multiplied in 2023

CREA / ARSIAL code	protein	lipid	fiber	ash	starch	1000-seeds weight	Kernel type
VA349	12.22 ± 0.06	4.97 ± 0.10	2.43 ± 0.16	1.63 ± 0.07	67.37 ± 0.39	303.3 ± 5.0	flint
VA350	13.67 ± 0.11	4.94 ± 0.08	2.44 ± 0.13	2.06 ± 0.19	65.94 ± 0.22	302.7 ± 16.4	flint
VA352	11.08 ± 0.07	5.79 ± 0.16	2.43 ± 0.18	1.97 ± 0.14	68.20 ± 0.34	323.3 ± 1.2	flint
VA353	11.64 ± 0.11	4.85 ± 0.16	2.73 ± 0.03	1.67 ± 0.19	66.70 ± 0.38	262.0 ± 18.0	intermediate
VA354	13.21 ± 0.09	4.63 ± 0.27	2.66 ± 0.17	1.91 ± 0.15	65.84 ± 0.72	210.7 ± 8.1	flint
VA355	11.98 ± 0.06	5.00 ± 0.29	2.28 ± 0.26	1.81 ± 0.28	67.35 ± 1.14	312.0 ± 6.9	intermediate
VA365	12.22 ± 0.13	5.00 ± 0.11	2.81 ± 0.07	2.26 ± 0.20	65.39 ± 0.46	268.7 ± 13.3	flint
VA367	13.01 ± 0.11	4.68 ± 0.19	3.11 ± 0.16	2.00 ± 0.39	64.44 ± 0.74	330.7 ± 8.1	flint
VA369	13.57 ± 0.22	5.18 ± 0.09	2.22 ± 0.26	1.91 ± 0.05	66.81 ± 1.41	163.4 ± 6.4	flint
VA375	13.09 ± 0.05	4.72 ± 0.09	2.33 ± 0.11	2.04 ± 0.26	67.25 ± 0.52	238.7 ± 5.0	flint
VA376	12.22 ± 0.01	4.51 ± 0.04	2.85 ± 0.11	1.95 ± 0.10	65.75 ± 0.20	258.7 ± 4.6	flint
VA379	12.10 ± 0.19	5.44 ± 0.18	2.44 ± 0.11	1.89 ± 0.16	67.93 ± 0.51	227.3 ± 7.0	flint
VA381	13.62 ± 0.07	4.30 ± 0.11	3.44 ± 0.18	2.08 ± 0.16	62.37 ± 0.32	202.7 ± 5.0	flint
VA382	12.38 ± 0.13	4.18 ± 0.08	2.40 ± 0.09	1.91 ± 0.10	65.95 ± 0.30	247.3 ± 6.1	flint
VA388	12.70 ± 0.01	4.94 ± 0.14	3.00 ± 0.10	1.98 ± 0.04	64.92 ± 0.18	283.3 ± 12.9	flint
VA390	12.47 ± 0.13	4.18 ± 0.09	2.87 ± 0.08	2.18 ± 0.07	64.68 ± 0.40	328.7 ± 4.2	semi-flint
VA391	12.83 ± 0.15	4.91 ± 0.16	2.89 ± 0.17	1.92 ± 0.26	65.46 ± 0.16	320.7 ± 13.3	flint
VA395	13.08 ± 0.08	4.29 ± 0.11	2.84 ± 0.18	1.95 ± 0.17	64.51 ± 0.19	302.7 ± 4.6	flint
VA397	12.37 ± 0.10	5.44 ± 0.20	2.66 ± 0.23	2.00 ± 0.03	67.34 ± 0.48	240.7 ± 4.6	flint
VE_0176	13.00 ± 0.04	3.53 ± 0.19	2.81 ± 0.24	0.77 ± 0.11	66.33 ± 0.73	124.0 ± 8.7	flint
VE_0177	13.03 ± 0.12	4.90 ± 0.18	2.69 ± 0.21	2.13 ± 0.12	65.33 ± 0.39	251.3 ± 9.5	flint
VE_0218	12.80 ± 0.10	4.54 ± 0.15	2.70 ± 0.14	1.78 ± 0.15	65.48 ± 0.40	230.0 ± 6.9	flint
VE_0219	12.67 ± 0.09	4.46 ± 0.07	3.00 ± 0.11	2.23 ± 0.10	65.79 ± 0.28	268.0 ± 5.3	flint
VE_0251	12.65 ± 0.11	4.41 ± 0.12	2.36 ± 0.14	1.69 ± 0.22	66.51 ± 0.62	262.7 ± 6.1	flint
VE_0262	12.29 ± 0.12	5.50 ± 0.41	2.39 ± 0.17	1.94 ± 0.15	66.82 ± 0.72	312.0 ± 6.9	flint
VE_0293	13.90 ± 0.01	4.83 ± 0.19	2.60 ± 0.12	2.01 ± 0.14	64.70 ± 0.13	234.7 ± 1.2	flint
VE_0341	13.01 ± 0.23	4.78 ± 0.31	2.44 ± 0.22	1.96 ± 0.44	67.16 ± 0.39	294.7 ± 4.2	flint
VE_0346	10.59 ± 0.11	5.39 ± 0.11	3.15 ± 0.31	2.24 ± 0.24	66.41 ± 0.77	270.0 ± 7.2	flint

VE_0347	12.50 ± 0.03	5.14 ± 0.06	2.77 ± 0.09	1.80 ± 0.04	66.54 ± 0.44	285.3 ± 5.0	flint
VE_0362	12.55 ± 0.09	5.08 ± 0.07	2.60 ± 0.11	1.95 ± 0.16	66.83 ± 0.08	248.0 ± 17.4	flint
VE_0367	13.27 ± 0.08	4.53 ± 0.05	2.56 ± 0.24	1.97 ± 0.09	66.28 ± 0.53	290.0 ± 10.6	flint
VE_0368	11.73 ± 0.18	4.90 ± 0.14	2.42 ± 0.33	1.81 ± 0.22	66.74 ± 0.43	256.0 ± 8.0	flint
VE_0439	12.49 ± 0.24	3.82 ± 0.18	1.35 ± 0.34	1.69 ± 0.17	66.77 ± 0.84	252.0 ± 0.0	flint
VE_0524	13.24 ± 0.08	4.00 ± 0.12	3.10 ± 0.09	1.75 ± 0.10	64.59 ± 0.38	263.3 ± 7.0	flint
VE_0526	13.42 ± 0.06	4.47 ± 0.33	2.19 ± 0.24	2.21 ± 0.25	66.47 ± 0.46	214.0 ± 3.5	flint
VE_0570	12.35 ± 0.07	4.14 ± 0.07	2.69 ± 0.20	1.66 ± 0.15	65.76 ± 0.45	284.0 ± 8.7	flint
VE_0728	12.91 ± 0.10	4.64 ± 0.20	2.59 ± 0.11	1.81 ± 0.07	65.62 ± 0.60	319.3 ± 4.2	flint
VE_0764	12.52 ± 0.08	4.28 ± 0.04	2.42 ± 0.08	1.75 ± 0.07	66.50 ± 0.11	275.3 ± 6.1	flint
VE_0785	12.41 ± 0.14	4.56 ± 0.14	2.72 ± 0.06	2.01 ± 0.04	64.71 ± 0.22	240.0 ± 12.2	flint
VE_0823	12.30 ± 0.06	4.64 ± 0.11	2.44 ± 0.12	1.76 ± 0.10	66.33 ± 0.46	350.7 ± 13.3	flint
VE_0824	11.49 ± 0.09	4.84 ± 0.17	2.50 ± 0.08	2.15 ± 0.13	66.32 ± 0.18	257.3 ± 10.1	flint
VE_0827	12.97 ± 0.18	3.94 ± 0.16	2.14 ± 0.32	1.75 ± 0.24	67.32 ± 0.44	288.7 ± 13.3	flint

**Table S2.** Variance analysis of grain chemical compounds and 1000-seeds weight of the landraces (DF = 41)

Factor	Mean Square	F
Protein	1.3811	85.40 **
Lipid	0.6719	19.22 **
Fiber	0.3577	10.18 **
Ash	0.1837	6.04 **
Starch	3.7739	13.65 **
1000-seeds weight	6,100.12	78.96 **

**Table S3.** Correlation analysis (n = 42) among the grain chemical compounds of the landraces

	Protein	Lipid	Fibre	Ash
Lipid	-0.40 ***			
Fibre	ns	ns		
Ash	ns	0.43***	ns	
Starch	-0.44 ***	0.40***	-0.65***	ns

**Table S4.** Statistics of the number of SNPs and Indels for the entire dataset

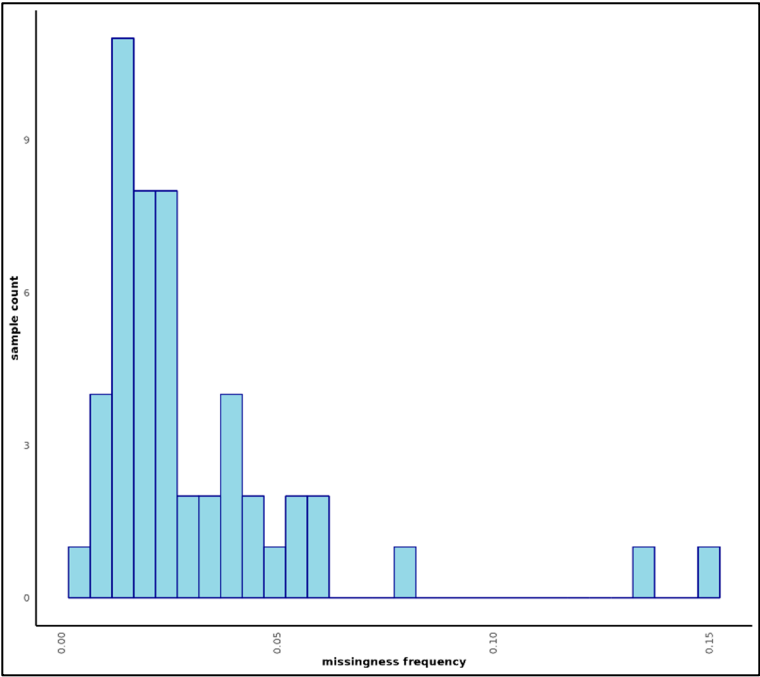
Identified SNPs and InDels	Number of genetic variants in the entire dataset
SNPs	846,917
singleton SNPs	51,823
Indels	136,637
singleton Indels	6,190
SNP/Indel ratio	6.20
Insertion/Deletion ratio	0.93
Transitions loci (Ts)	532,755

Transversions loci (Tv)	307,414
Ts/Tv ratio	1.73

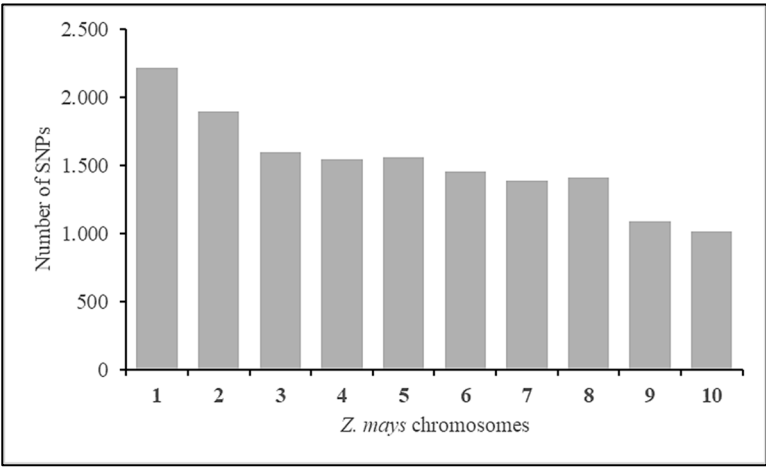
**Table S5.** Number and proportion of samples and loci kept after Quality Check (QC).

<b>Parameters</b>	<b>Before_QC</b>	<b>After_QC</b>	<b>Kept_percentage</b>
Number of samples	50	50	100 %
Number of loci	1,091.062	15,166	1.4 %

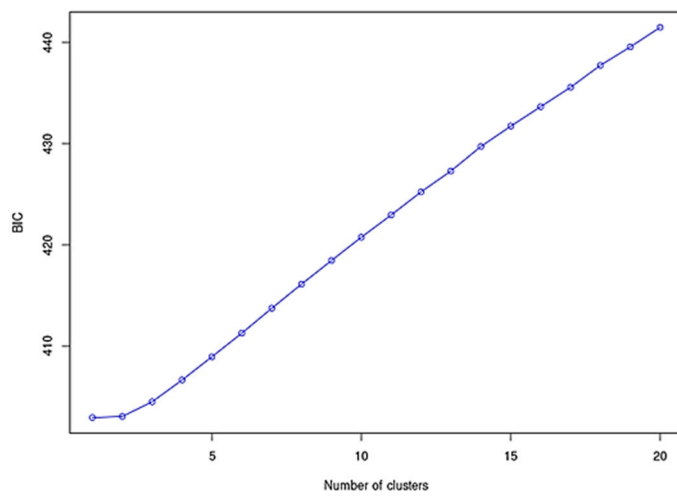
**FIGURES**



**Figure S1.** Plot depicting the proportion of missing loci for each sample.



**Figure S2.** Distribution of genetic variants (SNPs) on chromosomes.



**Figure S3.** Values of BIC versus number of clusters. BIC (Bayesian information criterion) values on Y-axis were plotted against different numbers of clusters.