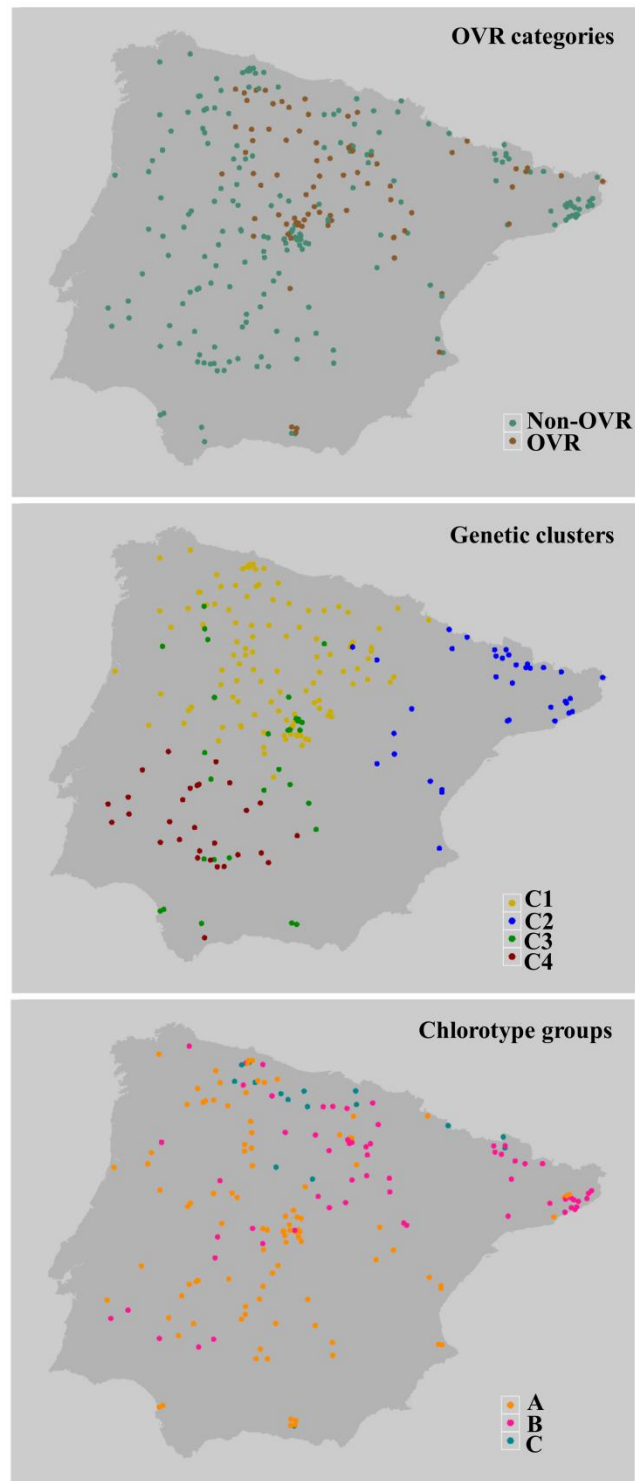


Figure S1. Spatial distribution of Iberian *Arabidopsis thaliana* accessions based on genetic units: OVR categories ($N = 279$), genetic clusters ($N = 212$) and chlorotype groups ($N = 181$).



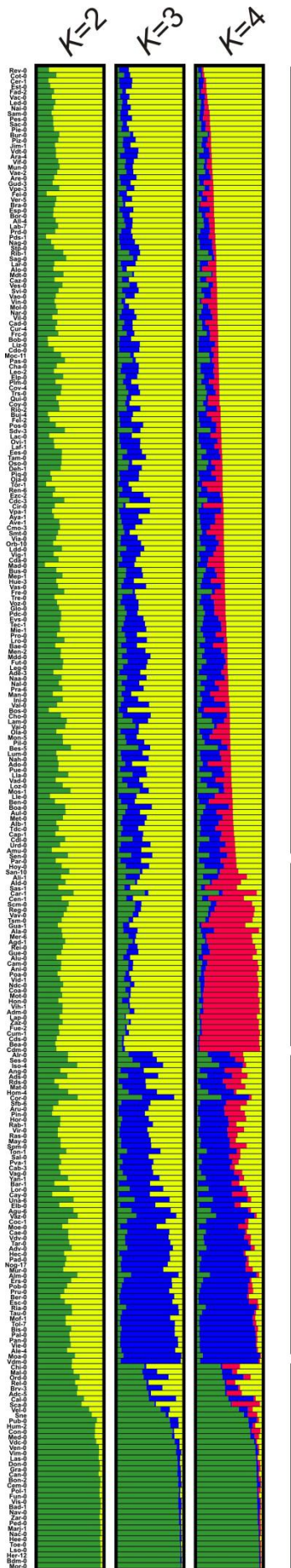


Figure S2. Genetic structure of Iberian *Arabidopsis thaliana* accessions estimated with STRUCTURE and nuclear SNPs. Accession are depicted as horizontal bars divided in segments representing the estimated membership proportions of genetic clusters (K) fitted in the model. Yellow, blue, green and red depict genetic clusters C1, C2, C3 and C4, respectively. Accessions are arranged according to estimated cluster memberships proportions for $K=4$.

Group 1

Group 4

Group 2

Group 3

Figure S3. Chlorotype network of *Arabidopsis thaliana* accessions estimated with NETWORK.

Chlorotype groups (A, B, and C) include closely related chlorotypes for the sake of simplicity. Each branch corresponds to one mutational step between chlorotypes. Non-observed mutational steps between chlorotypes are indicated by perpendicular dashes. Circle size is proportional to the number of accessions within chlorotypes.

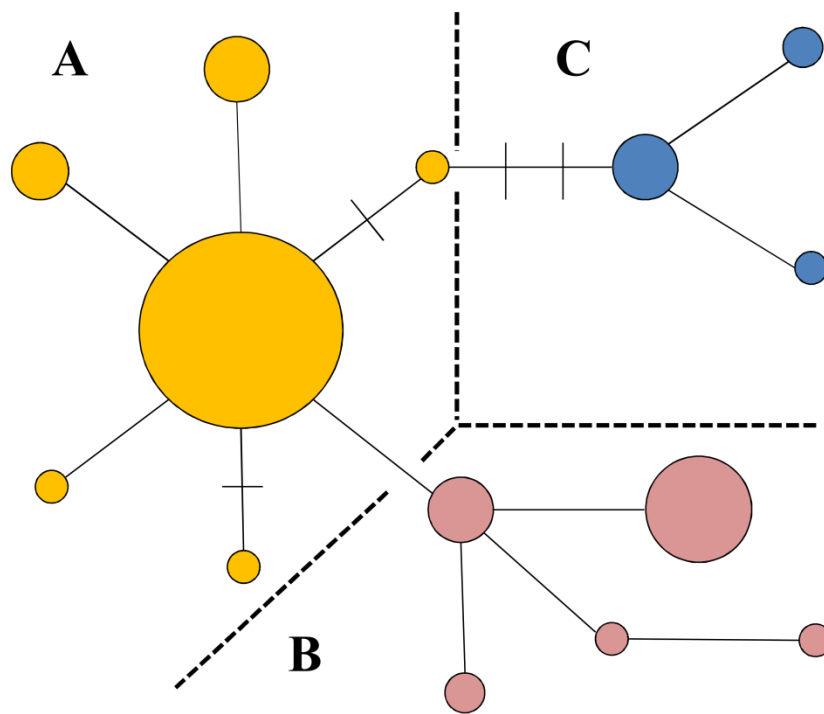


Table S1. Cohen's *d* and subsequent differences between OVR categories, nuclear genetic clusters and chlorotype genetic groups for each environmental variable.

Genetic Unit	Variable	Level		Cohen's <i>d</i>	L1 vs. L2
		L1	Level L2		
OVR category	BIO1	OVR	Non-OVR	-4.120 ± 0.331	1 <<< 2
OVR category	BIO2	OVR	Non-OVR	0.790 ± 0.257	1 >> 2
OVR category	BIO4	OVR	Non-OVR	1.206 ± 0.262	1 >>> 2
OVR category	BIO12	OVR	Non-OVR	-0.245 ± 0.253	1 < 2
OVR category	BIO15	OVR	Non-OVR	1.076 ± 0.261	1 >>> 2
OVR category	pH	OVR	Non-OVR	0.282 ± 0.253	1 > 2
OVR category	% Agriculture	OVR	Non-OVR	0.029 ± 0.252	1 ~ 2
OVR category	% Urban	OVR	Non-OVR	-0.981 ± 0.259	1 <<< 2
Genetic cluster	BIO1	C1	C2	3.424 ± 0.282	1 >>> 2
Genetic cluster	BIO1	C1	C3	2.130 ± 0.237	1 >>> 2
Genetic cluster	BIO1	C1	C4	-3.362 ± 0.302	1 <<< 2
Genetic cluster	BIO1	C2	C3	-0.162 ± 0.217	1 ~ 2
Genetic cluster	BIO1	C2	C4	-6.490 ± 0.388	1 <<< 2
Genetic cluster	BIO1	C3	C4	-3.725 ± 0.296	1 <<< 2
Genetic cluster	BIO2	C1	C2	0.778 ± 0.230	1 >> 2
Genetic cluster	BIO2	C1	C3	0.139 ± 0.212	1 ~ 2
Genetic cluster	BIO2	C1	C4	-0.627 ± 0.249	1 << 2
Genetic cluster	BIO2	C2	C3	-0.585 ± 0.219	1 << 2
Genetic cluster	BIO2	C2	C4	-1.013 ± 0.257	1 <<< 2
Genetic cluster	BIO2	C3	C4	-0.524 ± 0.242	1 << 2
Genetic cluster	BIO4	C1	C2	0.638 ± 0.228	1 >> 2
Genetic cluster	BIO4	C1	C3	-1.216 ± 0.221	1 <<< 2
Genetic cluster	BIO4	C1	C4	-0.110 ± 0.247	1 ~ 2
Genetic cluster	BIO4	C2	C3	-2.183 ± 0.243	1 <<< 2
Genetic cluster	BIO4	C2	C4	-1.144 ± 0.259	1 <<< 2
Genetic cluster	BIO4	C3	C4	1.285 ± 0.249	1 >>> 2
Genetic cluster	BIO12	C1	C2	-2.693 ± 0.265	1 <<< 2
Genetic cluster	BIO12	C1	C3	-1.540 ± 0.226	1 <<< 2
Genetic cluster	BIO12	C1	C4	-0.439 ± 0.248	1 < 2
Genetic cluster	BIO12	C2	C3	0.603 ± 0.219	1 >> 2
Genetic cluster	BIO12	C2	C4	2.514 ± 0.286	1 >>> 2
Genetic cluster	BIO12	C3	C4	1.239 ± 0.248	1 >>> 2
Genetic cluster	BIO15	C1	C2	3.346 ± 0.281	1 >>> 2
Genetic cluster	BIO15	C1	C3	-1.337 ± 0.223	1 <<< 2
Genetic cluster	BIO15	C1	C4	-4.402 ± 0.328	1 <<< 2
Genetic cluster	BIO15	C2	C3	-4.285 ± 0.289	1 <<< 2
Genetic cluster	BIO15	C2	C4	-10.234 ± 0.474	1 <<< 2
Genetic cluster	BIO15	C3	C4	-2.639 ± 0.272	1 <<< 2
Genetic cluster	pH	C1	C2	-2.325 ± 0.256	1 <<< 2
Genetic cluster	pH	C1	C3	-0.102 ± 0.212	1 ~ 2
Genetic cluster	pH	C1	C4	-0.126 ± 0.247	1 ~ 2
Genetic cluster	pH	C2	C3	1.321 ± 0.227	1 >>> 2
Genetic cluster	pH	C2	C4	2.626 ± 0.289	1 >>> 2
Genetic cluster	pH	C3	C4	0.017 ± 0.240	1 ~ 2

Genetic cluster	% Agriculture	C1	C2	1.143 ± 0.234	1 >>> 2
Genetic cluster	% Agriculture	C1	C3	1.686 ± 0.229	1 >>> 2
Genetic cluster	% Agriculture	C1	C4	-2.113 ± 0.272	1 <<< 2
Genetic cluster	% Agriculture	C2	C3	0.692 ± 0.220	1 >> 2
Genetic cluster	% Agriculture	C2	C4	-4.169 ± 0.329	1 <<< 2
Genetic cluster	% Agriculture	C3	C4	-5.913 ± 0.346	1 <<< 2
Genetic cluster	% Urban	C1	C2	3.416 ± 0.282	1 >>> 2
Genetic cluster	% Urban	C1	C3	3.966 ± 0.277	1 >>> 2
Genetic cluster	% Urban	C1	C4	2.535 ± 0.282	1 >>> 2
Genetic cluster	% Urban	C2	C3	0.137 ± 0.217	1 ~ 2
Genetic cluster	% Urban	C2	C4	-0.321 ± 0.250	1 < 2
Genetic cluster	% Urban	C3	C4	-0.438 ± 0.241	1 < 2
Chlorotype group	BIO1	A	B	0.801 ± 0.234	1 >>> 2
Chlorotype group	BIO1	A	C	4.314 ± 0.341	1 >>> 2
Chlorotype group	BIO1	B	C	2.271 ± 0.264	1 >>> 2
Chlorotype group	BIO2	A	B	0.499 ± 0.231	1 > 2
Chlorotype group	BIO2	A	C	1.408 ± 0.267	1 >>> 2
Chlorotype group	BIO2	B	C	0.386 ± 0.238	1 > 2
Chlorotype group	BIO4	A	B	1.983 ± 0.252	1 >>> 2
Chlorotype group	BIO4	A	C	3.790 ± 0.327	1 >>> 2
Chlorotype group	BIO4	B	C	1.648 ± 0.253	1 >>> 2
Chlorotype group	BIO12	A	B	-1.894 ± 0.250	1 <<< 2
Chlorotype group	BIO12	A	C	-3.164 ± 0.310	1 <<< 2
Chlorotype group	BIO12	B	C	-2.420 ± 0.268	1 <<< 2
Chlorotype group	BIO15	A	B	4.057 ± 0.298	1 >>> 2
Chlorotype group	BIO15	A	C	2.353 ± 0.288	1 >>> 2
Chlorotype group	BIO15	B	C	-1.204 ± 0.246	1 <<< 2
Chlorotype group	pH	A	B	-0.836 ± 0.234	1 <<< 2
Chlorotype group	pH	A	C	1.608 ± 0.271	1 >>> 2
Chlorotype group	pH	B	C	2.687 ± 0.273	1 >>> 2
Chlorotype group	% Agriculture	A	B	-0.069 ± 0.230	1 ~ 2
Chlorotype group	% Agriculture	A	C	0.443 ± 0.255	1 > 2
Chlorotype group	% Agriculture	B	C	0.736 ± 0.241	1 >> 2
Chlorotype group	% Urban	A	B	3.439 ± 0.284	1 >>> 2
Chlorotype group	% Urban	A	C	2.502 ± 0.292	1 >>> 2
Chlorotype group	% Urban	B	C	-0.273 ± 0.238	1 < 2

Table S2. Mean (\pm SE) values for genetic units and environmental variables included in SDMs and altitude.

Genetic unit	Altitude (m.a.s.l.)	BIO1 ($^{\circ}$ C)	BIO2 ($^{\circ}$ C)	BIO4 (CV)	BIO12 (mm)	BIO15 (CV)	pH	Agriculture Land (%)	Urban Cover (%)
Non-OVR	663.1(23.9)	13.0(0.2)	11.7(0.1)	5.84(0.53)	785.1(20.1)	40.0(1.0)	5.6(.01)	37.0(2.6)	8.3(1.5)
OVR	1110.8(40.3)	10.3(0.2)	12.0(0.1)	6.02(0.54)	738.2(30.1)	33.2(0.9)	5.9(0.1)	26.5(3.5)	1.57(.8)
C1	784.0(25.5)	11.7(.01)	11.8(0.1)	5.71(0.72)	772.6(29.9)	35.5(0.8)	5.4(0.1)	40.4(3.3)	9.6(2.2)
C2	1019.0(67.1)	10.4(0.4)	11.5(0.3)	5.95(0.73)	842.6(45.3)	26.2(1.1)	6.5(0.1)	14.3(3.8)	2.3(1.6)
C3	965.8(103.3)	12.3(0.6)	12.0(0.2)	6.24(0.98)	772.9(48.4)	47.4(2.0)	5.7(0.1)	13.6(4.6)	2.2(1.6)
C4	470.6(35.6)	15.9(0.2)	12.5(0.2)	6.28(0.68)	656.5(23.0)	57.4(1.5)	5.3(0.1)	59.4(6.9)	4.2(3.5)
A	750.7(37.4)	12.8(0.3)	12.0(0.1)	5.97(0.70)	736.0(27.8)	41.6(1.2)	5.6(0.1)	39.1(3.6)	8.0(2.2)
B	777.4(51.2)	11.8(0.3)	11.6(0.2)	5.76(0.79)	801.6(29.3)	32.2(1.5)	5.7(0.1)	34.5(4.6)	1.8(1.0)
C	1011.8(106.7)	9.8(0.6)	11.4(0.3)	5.23(1.66)	988.7(78.6)	31.5(3.1)	5.4(0.2)	31.6(8.7)	3.0(2.6)

Climatic variables: BIO1, annual mean temperature; BIO2, mean diurnal temperature range; BIO4, temperature seasonality; BIO12, annual precipitation; BIO15, precipitation seasonality. OVR categories: OVR and non-OVR; nuclear genetic clusters: C1, C2, C3 and C4; chloroplast genetic groups: A, B and C.

Table S3. Climatic variable percent contribution to the fit of the models.

Variable	Species	Phenotypic categories		Genetic clusters				Chlorotype groups		
	–	Non-OVR	OVR	C1	C2	C3	C4	A	B	C
BIO1	45.61	24.66	87.06	79.42	16.67	26.78	6.10	29.81	7.15	73.82
BIO2	3.79	3.34	0.80	1.69	4.70	1.50	0.11	3.34	1.85	0.00
BIO4	5.43	5.84	10.25	8.83	7.00	29.28	30.56	7.28	3.81	18.16
BIO12	36.14	47.02	0.55	5.30	12.04	6.25	2.84	40.79	37.54	0.76
BIO15	9.03	19.15	1.37	4.76	59.60	36.19	60.43	18.78	49.64	7.25

Climatic variables: BIO1, annual mean temperature; BIO2, mean diurnal temperature range; BIO4, temperature seasonality; BIO12, annual precipitation; BIO15, precipitation seasonality. The largest contributions summing more than 50% per genetic unit are given in bold face.