

Table S1 - Data information of samples used for environmental correlates analyses and number of individuals sequenced used for selection tests.

Note: all references can be found in the paper.

Sea Basin	Country	Location	Figure 1a code	Reference	Year	Month	Longitude	Latitude	N	A	B	Nseq	temperature	nitrate	salinity	silicate	phosphate	AOU
Baltic	Poland	Gdansk	1	Silva et al., 2014	2008	February	16.5	54.55	9	2	7	9	8.38	1.23	7.23	11.22	0.33	-0.11
Baltic	Germany	Kiel	2	Zarraonindia et al., 2012	2006	November	10.17	54.92	28	3	25		9.86	5.33	29.78	4.83	0.45	-0.14
Atlantic	Denmark	Denmark	3	Zarraonindia et al., 2012	2007	July	11.57	57.14	15	1	14		9.86	5.33	29.78	4.83	0.45	-0.14
Atlantic	Norway	Oslo	4	Silva et al., 2014	2007	October	10.63	58.98	24	2	22	24	9.57	4.32	35.06	2.54	0.42	0.01
Atlantic	Scotland	Scotland	5	Zarraonindia et al., 2012	2009	February	2.33	56.14	11	1	10		9.80	2.97	34.75	2.15	0.37	-0.01
Atlantic	Scotland	Scotland	5	Zarraonindia et al., 2012	2009	May	-1.15	58.09	24	5	19		9.57	4.32	35.06	2.54	0.42	0.01
Atlantic	Germany	Germany	6	Zarraonindia et al., 2012	2007	April	6.49	54.43	11	1	10		10.29	8.13	33.32	5.19	0.56	-0.12
Atlantic	France	English Channel	7	Silva et al., 2014	2007	October	0.12	50.75	27	3	24	27	11.91	8.27	34.75	4.12	0.53	-0.35
Atlantic	France	English Channel	7	Zarraonindia et al., 2012	2007	October	-4.28	50.2	25	5	20		12.42	4.44	35.21	2.23	0.29	-0.12
Atlantic	France	St Jean de Luz	8	Magoulas et al., 2006	2001	April	-1.68	43.4	50	21	29		16.02	0.87	35.33	0.92	0.06	-0.13
Atlantic	France	St Jean de Luz	8	Magoulas et al., 1996	1993	March	-1.68	43.4	47	19	28		16.02	0.87	35.33	0.92	0.06	-0.13
Atlantic	France	Nantes	8	Borrel et al., 2012	2009	May	-2.5	47	29	15	14		14.36	3.19	35.16	2.18	0.17	-0.06
Atlantic	Spain	Bay of Biscay-5029	8	Zarraonindia et al., 2012	2008	May	-1.87	45.87	29	13	16		15.07	2.10	35.10	1.78	0.13	-0.08
Atlantic	Spain	Bay of Biscay-5020	8	Zarraonindia et al., 2012	2009	May	-1.92	44.6	27	11	16		16.04	0.94	35.25	0.96	0.07	-0.12
Atlantic	Spain	Bay of Biscay-5001	8	Zarraonindia et al., 2012	2009	May	-2.21	43.35	45	31	14		15.99	0.85	35.36	0.92	0.06	-0.13
Atlantic	Spain	Bay of Biscay*	8	Silva et al., 2014	2007	-	-2.85	43.54	23	9	14	23	15.94	0.83	35.40	0.92	0.06	-0.14
Atlantic	Spain	East Cantabrian Sea	8	Borrel et al., 2012	2009	April	-2.6	44	15	9	6		15.96	0.83	35.39	0.92	0.06	-0.14
Atlantic	Spain	West Cantabrian Sea	8	Borrel et al., 2012	2009	April	-4.01	43.47	39	29	10		15.64	0.96	35.62	0.97	0.07	-0.13
Atlantic	Spain	Getaria Coast	8	Borrel et al., 2012	2009	May	-2.54	44.2	12	3	9		15.97	0.81	35.38	0.91	0.06	-0.14
Atlantic	Spain	Valdearenas	8	Borrel et al., 2012	2009	April	-3.97	43.44	20	10	10		15.75	0.88	35.55	0.96	0.06	-0.14
Atlantic	Spain	Galicia	9	Zarraonindia et al., 2012	2010	March	-8.94	42.53	29	26	3		15.37	1.30	35.68	0.79	0.11	-0.10
Atlantic	Portugal	Aveiro	10	Zarraonindia et al., 2012	2008	-	-8.66	40.71	23	18	5		16.30	0.95	35.77	0.84	0.09	-0.16
Atlantic	Portugal	Aveiro	10	Magoulas et al., 2006	1998	March	-8.66	40.71	70	63	7	25	16.30	0.95	35.77	0.84	0.09	-0.16
Atlantic	Portugal	Olhão	11	Magoulas et al., 2006	1997	July	-7.85	36.94	57	51	6		18.27	1.52	36.26	1.19	0.12	-0.13
Atlantic	Portugal	Portugal South	11	Zarraonindia et al., 2012	2008	February	-9.35	38.6	28	22	6		17.29	0.73	36.04	1.03	0.14	-0.14
Atlantic	Portugal	Armação de Pêra	11	Silva et al., 2014	2007	July	-8.4	37.1	29	24	5	29	18.07	1.31	36.26	1.16	0.12	-0.15
Atlantic	Spain	Cadiz	11	Zarraonindia et al., 2012	2009	April	-6.47	36.54	60	55	5		18.42	2.28	36.14	1.47	0.13	-0.08
Atlantic	Morocco	Tangier	11	Magoulas et al., 2006	1997	December	-5.85	35.88	62	60	2	38	18.60	2.39	36.34	1.54	0.14	-0.09
Atlantic	Spain	Canary islands	12	Zarraonindia et al., 2012	2007	May	-15.65	27.72	28	26	2		20.91	0.25	36.76	1.64	0.11	-0.10
Atlantic	Spain	Canary islands	12	Magoulas et al., 2006	1999	March	-15.04	28.27	48	44	4	24	20.68	0.30	36.65	1.95	0.13	-0.11
Atlantic	Senegal	Dakar	13	Magoulas et al., 2006	1999	March	-17.61	14.82	34	32	2	25	24.54	1.70	35.69	1.83	0.28	-0.06
Atlantic	Guinea-Bissau	Guinea-Bissau	14	Silva et al., submitted	2006	April	-14.23	9.72	20	20	0	20	26.82	1.23	34.33	1.91	0.27	0.01
Atlantic	Ghana	Accra	15	Silva et al., submitted	2008	April	0.02	5.59	25	25	0	25	27.15	0.98	34.91	5.49	0.20	-0.26
Atlantic	Angola	Angola	16	This work	2007	August	13.78	-10.9	24	20	4	24	24.85	1.39	35.36	4.03	0.25	-0.08
Atlantic	Namibia	Namibia	17	This work	2007	August	11.7	-17.17	24	5	19	24	18.52	10.44	35.64	4.38	0.86	0.24
Atlantic	South Africa	South Africa	18	Zarraonindia et al., 2012	2009	September	18	-34	30	4	26		17.50	2.24	35.38	5.18	0.61	-0.23
Atlantic	South Africa	Hout Bay	18	Grant et al., 2005	1987	August	18.35	-34.06	18	16	2		17.68	2.14	35.38	5.08	0.60	-0.23
Atlantic	South Africa	South Africa	18	This work	2007	August	20.97	-34.7	11	4	7	11	19.18	1.58	35.38	4.22	0.45	-0.14
Mediterranean	Spain	Alboran Sea	19	Zarraonindia et al., 2012	2009	October	-4.04	36.53	68	63	5		18.17	2.50	36.46	2.93	0.17	-0.08
Mediterranean	Spain	Malaga	19	Magoulas et al., 2006	1998	November	-4.35	36.6	47	43	4	25	18.21	2.52	36.46	2.75	0.17	-0.08
Mediterranean	Spain	Balearics	20	Zarraonindia et al., 2012	2007	-	0.89	40.55	26	9	17		18.34	0.68	37.63	1.19	0.13	-0.08
Mediterranean	Spain	Tarragona	20	Zarraonindia et al., 2012	2009	March	1.17	40.88	33	11	22		18.23	0.69	37.63	1.09	0.14	-0.07
Mediterranean	Spain	Barcelona	20	Grant et al., 2005	1988	September	1.86	41.12	16	7	9		18.02	0.74	37.71	1.15	0.15	-0.04
Mediterranean	France	Gulf of Lion	21	This work	2008	June	3.98	43.2	22	5	17	22	16.70	1.22	37.95	1.18	0.17	0.13
Mediterranean	France	Sete	21	Magoulas et al., 1996	1992	December	3.98	43.2	50	21	29		16.70	1.22	37.95	1.18	0.17	0.13
Mediterranean	Italy	Livorno	22	Magoulas et al., 2006	1998	May	10.09	43.52	55	27	28		17.63	1.23	38.04	2.11	0.16	-0.05
Mediterranean	Tunisia	Tunis	23	This work	2009	February	10.65	37.28	28	16	12	28	18.60	1.25	37.37	3.50	0.11	-0.06
Mediterranean	Italy	Chioggia	24	Magoulas et al., 1996	1993	November	12.49	45.31	57	7	50		17.19	0.57	37.33	2.16	0.07	-0.07
Mediterranean	Italy	Chioggia	24	Magoulas et al., 2006	1997	July	12.49	45.31	57	5	52	28	17.19	0.57	37.33	2.16	0.07	-0.07
Mediterranean	Croatia	Split	25	Borrel et al., 2012	2009	June	16.13	43.03	20	5	15		17.88	0.69	38.10	3.94	0.05	0.00
Mediterranean	Italy	Adriatic Sea	25	Zarraonindia et al., 2012	2007	October	15.47	42.83	27	3	24		17.80	0.71	38.07	3.80	0.06	0.01
Mediterranean	Italy	Bari	25	Magoulas et al., 2006	1997	July	17	41.3	70	8	62		18.07	0.42	38.41	3.92	0.08	-0.07
Mediterranean	Italy	Otranto	25	Magoulas et al., 2006	1998	August	18.55	40.14	71	15	56		18.95	0.35	38.29	6.07	0.04	-0.11
Mediterranean	Greece	Aegean Sea	26	Zarraonindia et al., 2012	2008	July	24.68	40.25	32	31	1		17.86	0.43	37.88	5.04	0.11	-0.11
Mediterranean	Greece	Gulf of Kavala	26	Magoulas et al., 1996	1989	May	24.29	40.65	141	121	20		17.89	0.43	37.83	4.99	0.11	-0.11
Mediterranean	Greece	Gulf of Kavala	26	Magoulas et al., 1996	1989	October	24.3	40.6	57	46	11		17.89	0.43	37.83	4.99	0.11	-0.11
Mediterranean	Greece	Pagassitikos Gulf	26	Magoulas et al., 1996	1992	September	23.6	38.91	20	17	3		18.10	0.40	37.83	4.48	0.10	-0.10
Mediterranean	Greece	Oreoi Strait	26	Kristoffersen & Magoulas 2008	2000	December	23.03	38.96	126	105	21		18.08	0.42	37.74	4.57	0.10	-0.10
Mediterranean	Greece	Oreoi Strait	26	Kristoffersen & Magoulas 2008	2000	December	23.03	38.96	56	44	12		18.08	0.42	37.74	4.57	0.10	-0.10
Mediterranean	Greece	Oreoi Strait	26	Kristoffersen & Magoulas 2008	2000	December	23.03	38.96	115	85	30		18.08	0.42	37.74	4.57	0.10	-0.10
Mediterranean	Greece	Saronikos Gulf	26	Magoulas et al., 1996	1993	June	23.07	37.17	59	20	39		19.15	0.43	38.85	1.63	0.12	-0.11
Mediterranean	Greece	Patraikos Gulf	26	Magoulas et al., 1996	1989	August	21.67	38.26	118	36	82		19.69	0.43	38.54	2.97	0.11	-0.10
Mediterranean	Greece	Patras	26	Kristoffersen & Magoulas 2008	2001	January	21.67	38.26	103	42	61		19.69	0.43	38.54	2.97	0.11	-0.10
Mediterranean	Greece	Patraikos Gulf	26	Magoulas et al., 1996	1989	October	21.67	38.26	54	21	33		19.69	0.43	38.54	2.97	0.11	-0.10
Mediterranean	Greece	Patras	26	Kristoffersen & Magoulas 2008	2001	February	21.67	38.26	86	30	56		19.69	0.43	38.54	2.97	0.11	-0.10
Mediterranean	Israel	Telaviv	27	This work	2008	July	34.59	32.08	26	26	0	26	21.94	0.32	39.09	1.68	0.11	-0.01

N: total number of individuals; A: number of clade A individuals; B: number of clade B individuals; Nseq: number of sequences used in tests of recombination and selection.

Table S2 - Significant physico-chemical properties of Cytb codon 368 amino acid changes ($p < 0.001$): TreeSAAP analyses of magnitude categories ranging from 6 to 8.

Property	Property reference	Category	Z-score value
Normalized frequency of C-terminal beta-sheet	CHOP780209	6	3.257
Normalized frequency of alpha-helix, with weights	LEVM780101	6	4.761
Distribution of amino acid residues in the 18 non-redundant families of thermophilic proteins	KUMS000101	6	4.787
Normalized positional residue frequency at helix termini C4	AURR980112	6	5.14
Amino acid composition	DAYM780101	6	5.31
Alpha-helix indices for alpha/beta-proteins	GEIM800104	6	6.918
Amino acid distribution	JUKT750101	7	3.402
AA composition of EXT of single-spanning proteins	NAKH920103	7	4.368
Normalized frequency of beta-sheet in alpha/beta class	PALJ810112	7	4.897
Normalized frequency of alpha-helix in alpha/beta class	PALJ810109	7	5.045
Heat capacity	HUTJ700101	7	5.75
Normalized composition from animal	NAKH900106	8	3.51
Normalized composition of mt-proteins	NAKH900104	8	3.51
Relative preference value at C5	RICJ880110	8	4.25
A parameter defined from the residuals obtained from the best correlation of the Chou-Fasman parameter of beta-sheet	CHAM830102	8	5.045