

## **SUPPORTING INFORMATION**

Ecology and Evolution

**Evolutionary history of the endemic water shrew *Neomys anomalus*: recurrent phylogeographic patterns in semi-aquatic mammals of the Iberian Peninsula**

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**Table S1.** Samples used in this study with information about location, river basin, collection year, mitochondrial phylogroup, sample type and genes sequenced in each sample. Samples of a previous study (Igea et al. 2015) are also included.

Specimen Code	Latitude	Longitude	Basin	Year	Phylogroup	Sample type	Cytochrome <i>b</i>	D-loop
IBE-C326	43.10042	-5.0077	Duero	2009	B	Faeces	yes	yes
IBE-C331	43.19352	-4.90761	Deva	2009	A1	Faeces	yes	yes
IBE-C333	43.31652	-4.85735	Deva	2009	B	Faeces	yes	yes
IBE-C360	43.25681	-4.7649	Deva	2009	B	Faeces	yes	yes
IBE-C370	43.11025	-4.74269	Deva	2009	B	Faeces	yes	no
IBE-C385	43.22616	-5.03102	Sella	2009	B	Faeces	yes	no
IBE-C524	43.05728	-6.24462	Nalón	2009	A1	Faeces	yes	yes
IBE-C529	42.08666	-6.71346	Duero	2010	A1	Faeces	yes	yes
IBE-C544	43.10209	-5.80897	Nalón	2009	A1	Faeces	yes	yes
IBE-C568	42.98546	-6.00301	Duero	2009	A1	Faeces	yes	yes
IBE-C573	43.01	-6.22696	Miño	2009	A1	Faeces	yes	no
IBE-C597	42.97739	-4.18256	Ebro	2010	B	Faeces	yes	yes
IBE-C630	43.25778	-4.26971	Saja	2009	B	Faeces	yes	no
IBE-C637	43.20201	-4.29735	Saja	2009	B	Faeces	yes	no
IBE-C688	43.14253	-5.05624	Sella	2009	B	Faeces	yes	no
IBE-C690	43.12679	-5.03696	Sella	2009	A1	Faeces	yes	no
IBE-C692	43.25934	-4.80843	Deva	2009	B	Faeces	yes	yes
IBE-C698	43.14565	-4.91028	Deva	2009	A1	Faeces	yes	yes
IBE-C740	43.25385	-4.83628	Deva	2009	B	Faeces	yes	no
IBE-C748	43.18185	-4.99829	Sella	2009	A1	Faeces	yes	yes
IBE-C761	43.02841	-4.21989	Ebro	2009	B	Faeces	yes	no
IBE-C785	42.75127	-8.41541	Ulla	2010	A1	Faeces	yes	no
IBE-C825	41.58792	-7.80231	Duero	2010	A1	Faeces	yes	yes
IBE-C843	41.63747	-7.8033	Duero	2010	A1	Faeces	yes	yes
IBE-C1029	42.97746	-4.7547	Duero	2010	B	Faeces	yes	yes
IBE-C1054	42.10114	-2.90045	Ebro	2011	B	Faeces	yes	no
IBE-C1061	42.12813	-2.9273	Ebro	2011	B	Faeces	yes	yes
IBE-C1114	42.949	-4.75971	Duero	2010	B	Faeces	yes	no
IBE-C1144	43.10283	-6.64592	Nalón	2010	A1	Igea et al. 2015	yes	no
IBE-C1435	41.71436	-4.98809	Duero	2010	A2b	Igea et al. 2015	yes	no
IBE-C1510	40.33764	-5.76692	Tajo	2010	A2a	Faeces	yes	yes
IBE-C1515	40.3709	-5.75221	Tajo	2010	A2a	Faeces	yes	yes
IBE-C1516	42.08723	-6.72401	Duero	2010	B	Faeces	yes	yes
IBE-C1518	40.48633	-6.00621	Tajo	2010	A2a	Faeces	yes	yes
IBE-C1520	40.51167	-6.13109	Tajo	2010	A2a	Faeces	yes	yes
IBE-C1662	41.97124	-2.61497	Duero	2010	B	Igea et al. 2015	yes	yes
IBE-C1683	42.16723	-6.6566	Duero	2010	A1	Igea et al. 2015	yes	yes
IBE-C1750	40.34456	-5.76397	Tajo	2010	A2a	Faeces	yes	no
IBE-C1789	40.26076	-5.52136	Duero	2008	A2a	Igea et al. 2015	yes	no
IBE-C1856	43.20814	-5.19865	Sella	2010	B	Faeces	yes	no
IBE-C2520	43.10003	-5.57721	Nalón	2011	A1	Faeces	yes	yes
IBE-C2604	40.89207	0.1101	Ebro	2011	A2b	Faeces	yes	no

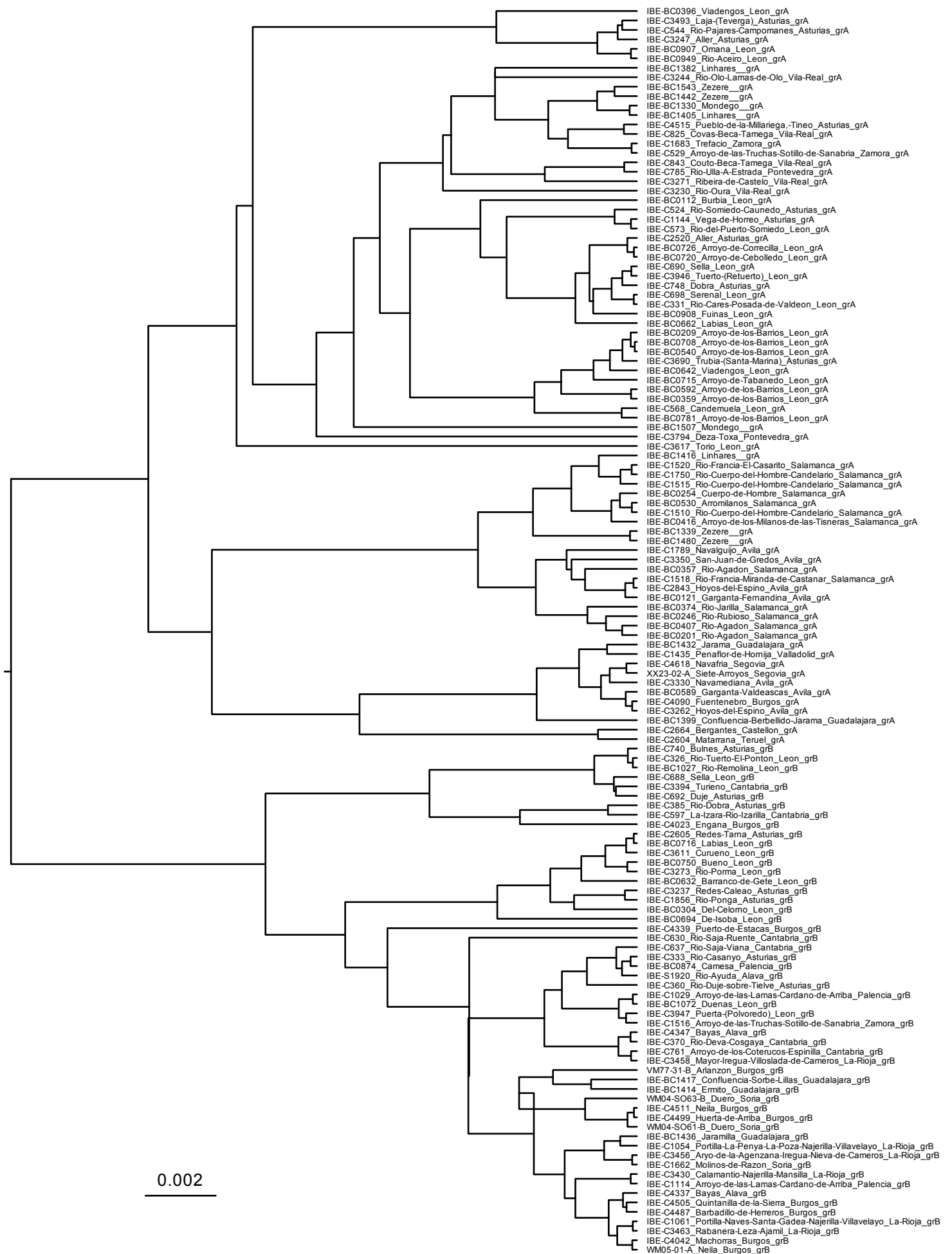
IBE-C2605	43.10958	-5.22665	Nalón	2011	B	Faeces	yes	no
IBE-C2664	40.66073	-0.19369	Ebro	2011	A2b	Igea et al. 2015	yes	yes
IBE-C2843	40.27592	-5.23156	Duero	2011	A2a	Faeces	yes	yes
IBE-C3230	41.67061	-7.46992	Duero	2011	A1	Faeces	yes	no
IBE-C3237	43.17402	-5.39107	Nalón	2011	B	Faeces	yes	yes
IBE-C3244	41.3685	-7.7885	Duero	2011	A1	Faeces	yes	yes
IBE-C3247	43.05733	-5.55589	Nalón	2011	A1	Faeces	yes	no
IBE-C3262	40.33895	-5.13038	Duero	2011	A2b	Faeces	yes	yes
IBE-C3271	41.57444	-7.67904	Duero	2011	A1	Faeces	yes	no
IBE-C3273	43.04699	-5.27944	Duero	2011	B	Faeces	yes	yes
IBE-C3330	40.3163	-5.41582	Duero	2011	A2b	Faeces	yes	yes
IBE-C3350	40.36109	-5.26672	Duero	2011	A2a	Faeces	yes	yes
IBE-C3394	43.16645	-4.65828	Deva	2011	B	Faeces	yes	yes
IBE-C3430	42.18963	-2.92848	Ebro	2011	B	Faeces	yes	no
IBE-C3456	42.22131	-2.65816	Ebro	2011	B	Faeces	yes	no
IBE-C3458	42.10397	-2.70577	Ebro	2011	B	Faeces	yes	no
IBE-C3463	42.12746	-2.47893	Ebro	2011	B	Faeces	yes	yes
IBE-C3493	43.17028	-6.14498	Nalón	2012	A1	Faeces	yes	yes
IBE-C3611	42.90949	-5.39537	Duero	2011	B	Faeces	yes	yes
IBE-C3617	42.97483	-5.55803	Duero	2011	A1	Faeces	yes	no
IBE-C3690	43.14796	-5.9559	Nalón	2012	A1	Faeces	yes	no
IBE-C3794	42.68339	-8.28367	Ulla	2013	A1	Faeces	yes	yes
IBE-C3946	43.07209	-5.02095	Duero	2012	A1	Faeces	yes	yes
IBE-C3947	43.05577	-5.09282	Duero	2012	B	Faeces	yes	yes
IBE-C4023	43.05696	-3.73039	Ebro	2012	B	Faeces	yes	yes
IBE-C4042	43.12651	-3.61119	Ebro	2012	B	Faeces	yes	no
IBE-C4090	41.50399	-3.77884	Duero	2013	A2b	Tissue	yes	yes
IBE-C4337	42.99514	-2.83592	Ebro	2014	B	Faeces	yes	yes
IBE-C4339	43.11491	-3.67615	Ebro	2014	B	Faeces	yes	yes
IBE-C4347	42.99513	-2.83591	Ebro	2014	B	Faeces	yes	yes
IBE-C4487	42.1603	-3.1695	Duero	2014	B	Faeces	yes	yes
IBE-C4499	42.09864	-3.06499	Duero	2014	B	Faeces	yes	yes
IBE-C4505	42.012	-3.01823	Duero	2014	B	Faeces	yes	yes
IBE-C4511	42.06634	-3.03681	Ebro	2014	B	Faeces	yes	yes
IBE-C4515	43.37716	-6.36027	Nalón	2015	A1	Tissue	yes	yes
IBE-C4618	41.03733	-3.8249	Duero	2015	A2b	Faeces	yes	yes
IBE-S1920	42.76235	-2.5866	Ebro	2009	B	Faeces	yes	no
VM77-31-B	42.20373	-3.27355	Duero	2014	B	Faeces	yes	yes
WM04-SO61-B	41.96772	-2.92292	Duero	2014	B	Faeces	yes	yes
WM04-SO63-B	41.9882	-2.9154	Duero	2014	B	Faeces	yes	yes
WM05-01-A	42.08181	-2.97969	Ebro	2014	B	Faeces	yes	yes
XX23-02-A	40.85048	-3.94726	Tajo	2014	A2b	Faeces	yes	yes
IBE-BC0112	42.70769	-6.78053	Miño	2014	A1	Faeces	yes	yes
IBE-BC0121	40.32854	-4.91813	Tajo	2014	A2a	Faeces	yes	yes
IBE-BC0201	40.50271	-6.2179	Duero	2014	A2a	Faeces	yes	yes
IBE-BC0209	42.84774	-5.67969	Duero	2014	A1	Faeces	yes	yes
IBE-BC0246	40.28092	-6.77457	Duero	2014	A2a	Faeces	yes	yes

IBE-BC0254	40.33267	-5.76922	Tajo	2014	A2a	Faeces	yes	yes
IBE-BC0304	43.0111	-5.30854	Duero	2014	B	Faeces	yes	yes
IBE-BC0357	40.50319	-6.21647	Duero	2014	A2a	Faeces	yes	yes
IBE-BC0359	42.8479	-5.68013	Duero	2014	A1	Faeces	yes	yes
IBE-BC0374	40.34232	-5.7647	Tajo	2014	A2a	Faeces	yes	yes
IBE-BC0396	42.9575	-5.76094	Duero	2014	A1	Faeces	yes	yes
IBE-BC0407	40.49979	-6.23006	Duero	2014	A2a	Faeces	yes	yes
IBE-BC0416	40.4869	-6.06411	Tajo	2014	A2a	Faeces	yes	yes
IBE-BC0530	40.49129	-6.03258	Tajo	2014	A2a	Faeces	yes	yes
IBE-BC0540	42.8479	-5.68013	Duero	2014	A1	Faeces	yes	yes
IBE-BC0589	40.31703	-5.13832	Duero	2014	A2b	Faeces	yes	yes
IBE-BC0592	42.84783	-5.68012	Duero	2014	A1	Faeces	yes	yes
IBE-BC0632	42.93044	-5.5607	Duero	2014	B	Faeces	yes	yes
IBE-BC0642	42.95808	-5.76149	Duero	2014	A1	Faeces	yes	yes
IBE-BC0662	42.96648	-5.42442	Duero	2014	A1	Faeces	yes	yes
IBE-BC0694	43.054	-5.32041	Duero	2014	B	Faeces	yes	yes
IBE-BC0708	42.84783	-5.68058	Duero	2014	A1	Faeces	yes	yes
IBE-BC0715	42.91698	-5.53824	Duero	2014	A1	Faeces	yes	yes
IBE-BC0716	42.96655	-5.42442	Duero	2014	B	Faeces	yes	yes
IBE-BC0720	43.06115	-5.37404	Duero	2014	A1	Faeces	yes	yes
IBE-BC0726	42.88462	-5.46132	Duero	2014	A1	Faeces	yes	yes
IBE-BC0750	42.99805	-5.25956	Duero	2014	B	Faeces	yes	yes
IBE-BC0781	42.84788	-5.68057	Duero	2014	A1	Faeces	yes	yes
IBE-BC0874	42.93563	-4.24247	Duero	2014	B	Faeces	yes	yes
IBE-BC0907	42.84849	-6.21617	Duero	2014	A1	Faeces	yes	yes
IBE-BC0908	42.73962	-6.20847	Miño	2014	A1	Faeces	yes	yes
IBE-BC0949	42.73718	-6.19317	Miño	2014	A1	Faeces	yes	yes
IBE-BC1027	42.92745	-5.08191	Duero	2014	B	Faeces	yes	yes
IBE-BC1072	42.92961	-5.11575	Duero	2014	B	Faeces	yes	yes
IBE-BC1330	40.48571	-7.41484	Mondego	2015	A1	Faeces	yes	yes
IBE-BC1339	40.38271	-7.54584	Tajo	2015	A2a	Faeces	yes	yes
IBE-BC1382	40.52997	-7.49779	Mondego	2015	A1	Faeces	yes	yes
IBE-BC1399	41.08402	-3.42982	Tajo	2015	A2b	Faeces	yes	yes
IBE-BC1405	40.46776	-7.59768	Mondego	2015	A1	Faeces	yes	yes
IBE-BC1414	41.11642	-3.49308	Tajo	2015	B	Faeces	yes	yes
IBE-BC1416	40.5303	-7.49747	Mondego	2015	A2a	Faeces	yes	yes
IBE-BC1417	41.21845	-3.29172	Tajo	2015	B	Faeces	yes	yes
IBE-BC1432	41.10345	-3.48929	Tajo	2015	A2b	Faeces	yes	yes
IBE-BC1436	41.16917	-3.37749	Tajo	2015	B	Faeces	yes	yes
IBE-BC1442	40.32822	-7.58676	Tajo	2015	A1	Faeces	yes	yes
IBE-BC1480	40.34883	-7.56329	Tajo	2015	A2a	Faeces	yes	yes
IBE-BC1507	40.44262	-7.51313	Mondego	2015	A1	Faeces	yes	yes
IBE-BC1543	40.35643	-7.55865	Tajo	2015	A1	Faeces	yes	yes

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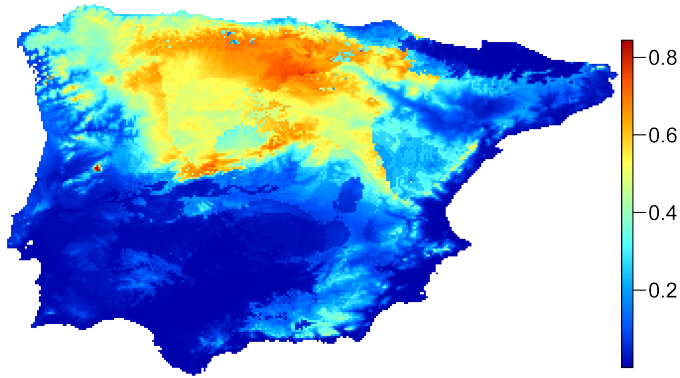
**Table S2.** Mitochondrial genetic diversity statistics of the cytochrome *b* (Cytb) and D-loop fragments of *Neomys anomalus* calculated for all the samples and for the four main mitochondrial phylogroups (A and B). N = number of sequences; S = number of segregating sites; h = number of haplotypes; Hd = haplotype diversity;  $\pi$  = nucleotide diversity per site;  $\emptyset$  = Watterson's estimator of nucleotide diversity per site.

	Cytb (All)	Cytb (A)	Cytb (B)	D-loop (All)	D-loop (A)	D-loop (B)
N	132	78	54	103	65	38
S	64	49	13	82	65	45
h	50	35	15	65	41	24
Hd	0.96	0.96	0.83	0.98	0.98	0.96
$\pi$	0.0083	0.0068	0.0020	0.0455	0.0386	0.0362
$\emptyset$	0.0138	0.0116	0.0033	0.0511	0.0439	0.0338

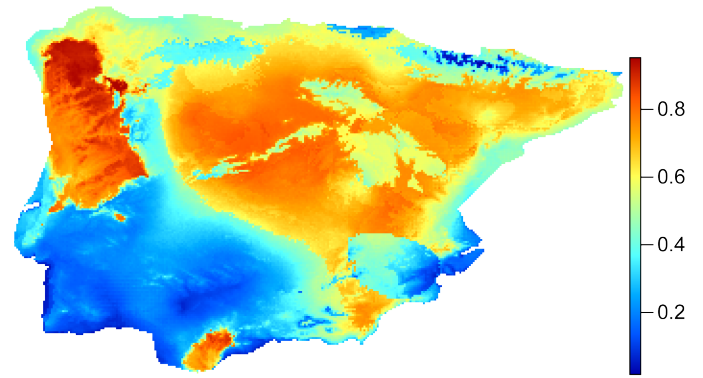


**Figure S1.** Beast tree with tips labeled with sample codes and locality information (locality and province). The scale bar is in substitutions per position.

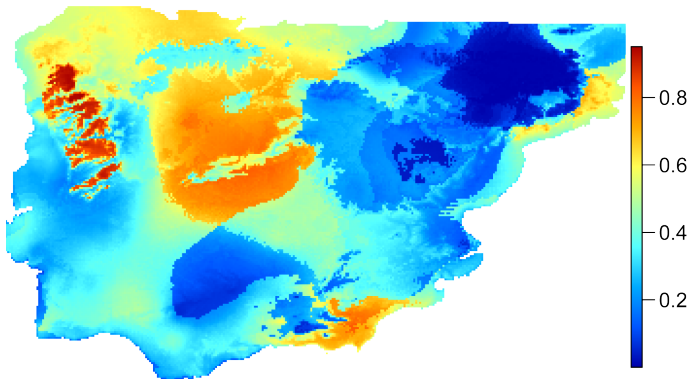
**A. Current**



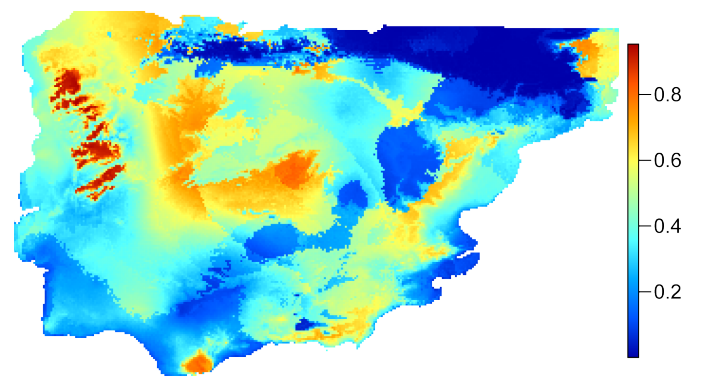
**B. CCSM**



**C. MIROC**



**D. MSPI**



**Figure S2.** Projection of the species distribution model to the current climate scenario (A) and to the Last Glacial climatic models: CCSM (B), MIROC (C) and MSPI (D).