

Zhao, Z., Shao, L., Li, F., Zhang, X. and Li, S. 2020. Tectonic evolution of the Tethyan region created the Eurasian extratropical biodiversity hotspots: tracing Pireneitega spiders' diversification history. – Ecography doi: 10.1111/ecog.05044

Supplementary material

Appendix 1

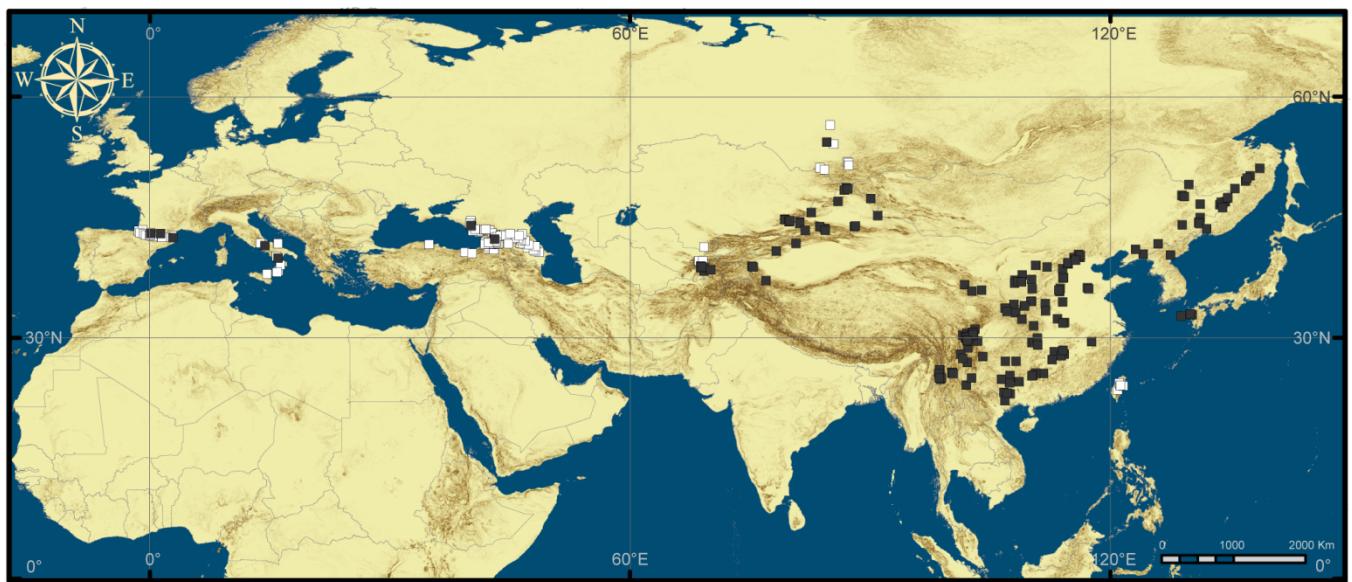


Fig. A1. The sampling distributions of all 36 *Pireneitega* species based on collections (black) and literature (white).

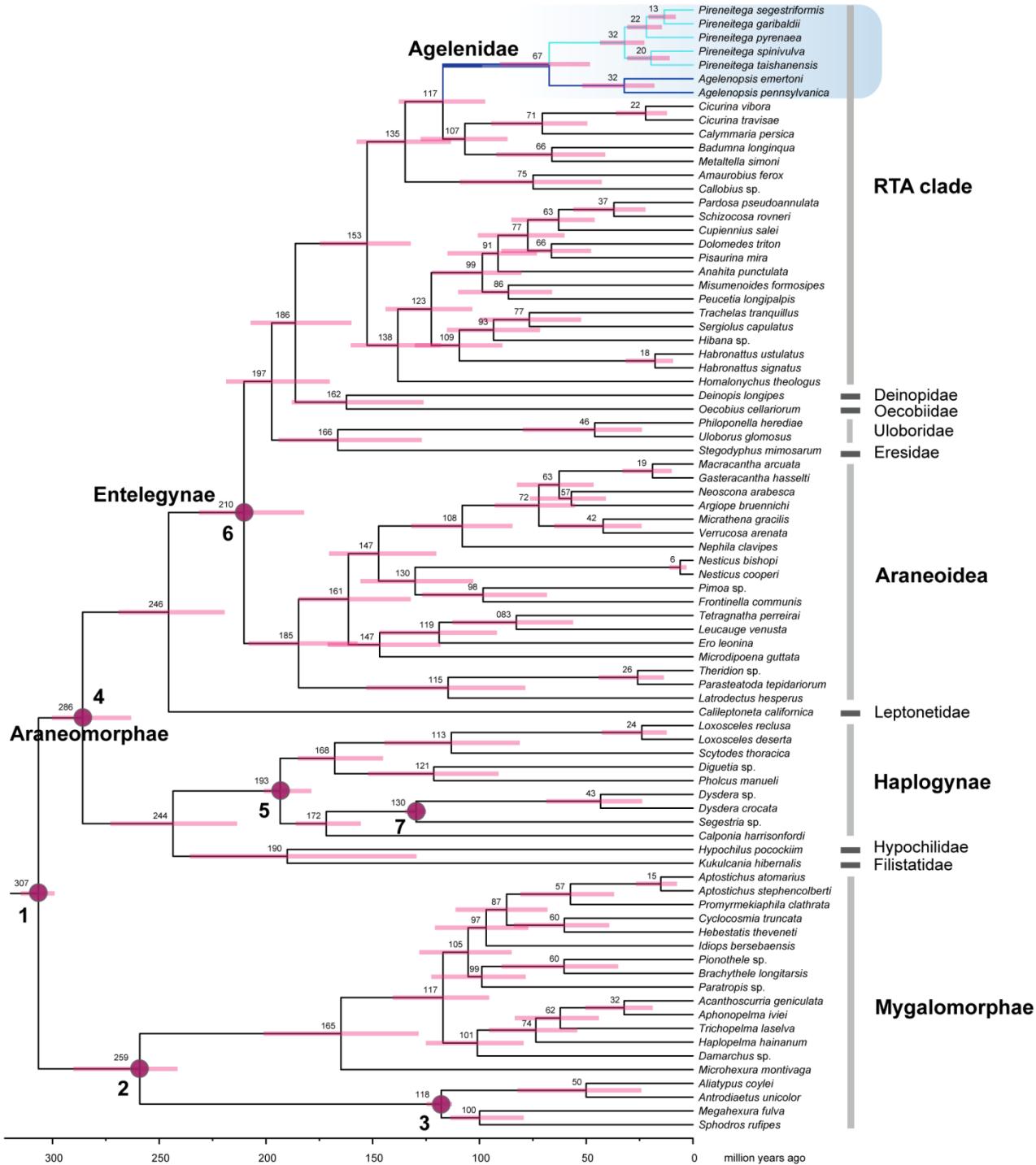


Fig. A2. Phylogenetic time tree inferred using MCMCTREE in Paml based on the 84-taxa transcriptome datasets. The seven fossil calibration points are indicated by dots, and node IDs correspond to Table A3. The numbers show the mean ages of the nodes, and pink bars reflect 95% confidence intervals of age estimates.

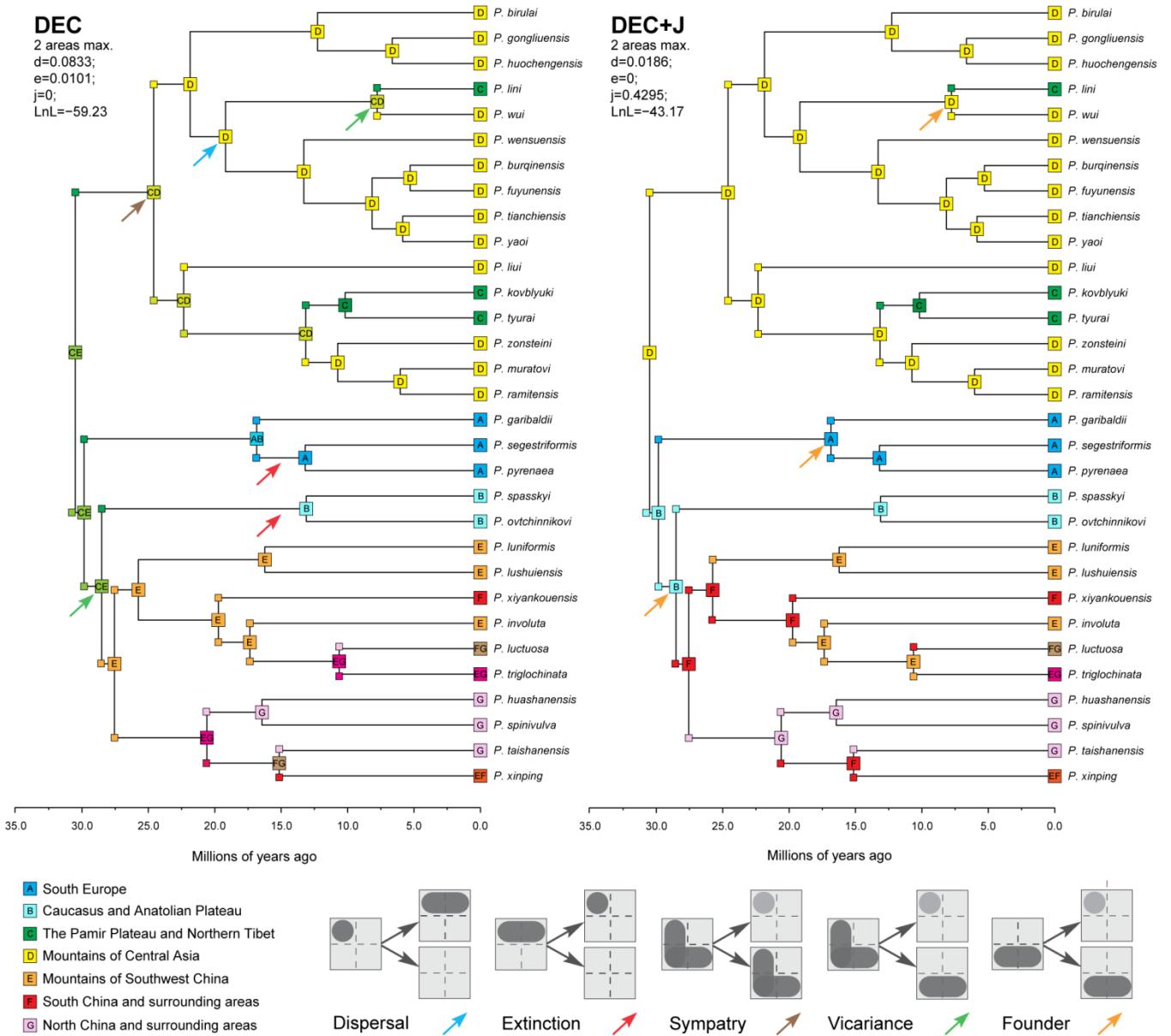


Fig. A3. The most likely ancestral range reconstructed under both DEC and DEC+J models in BioGeoBEARS based on a time calibrated species tree. The arrows on the nodes indicate when anagenetic or cladogenetic events occurred.

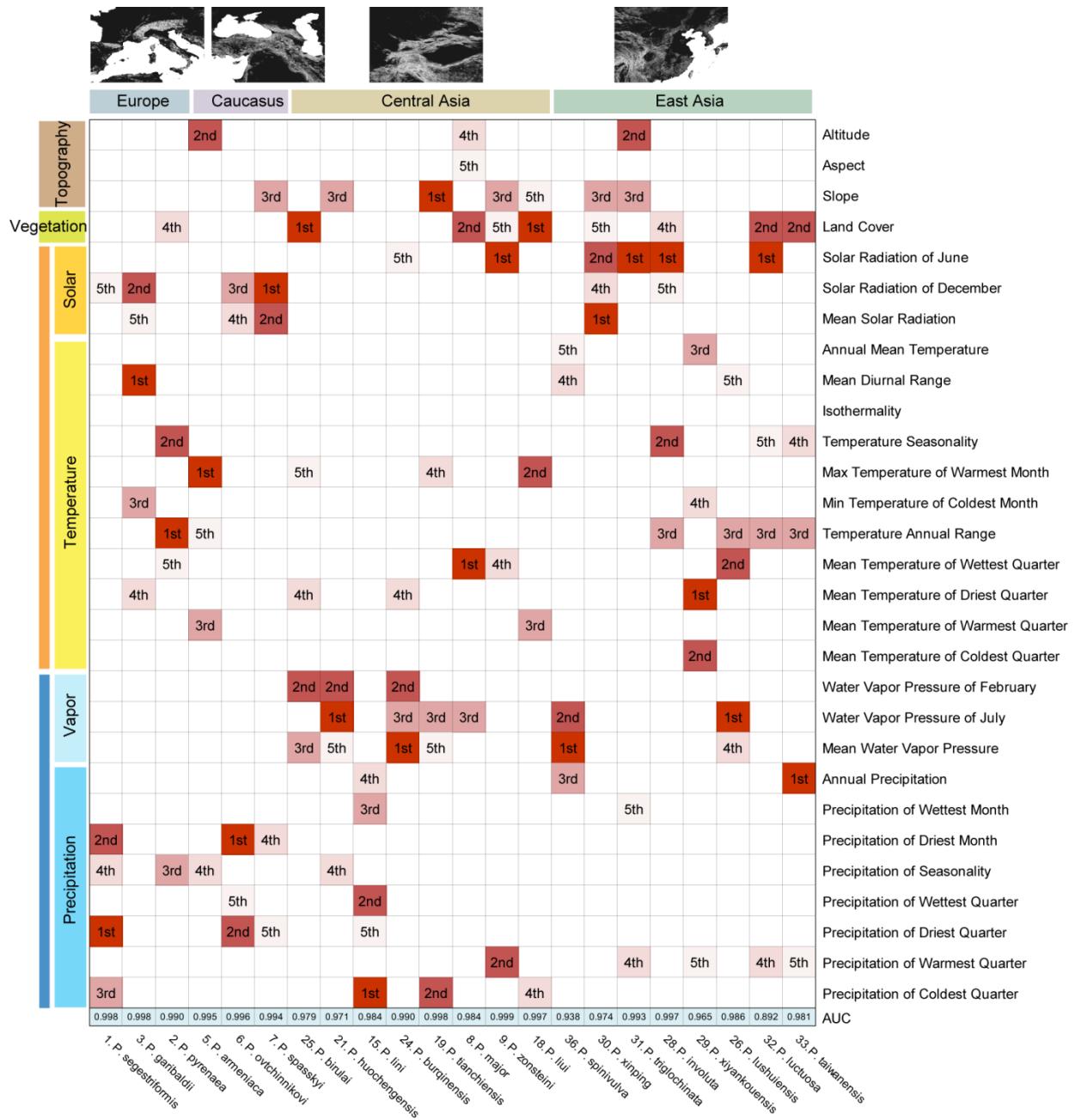


Fig. A4. The statistics show the AUC values from MaxEnt modeling and the top five environmental variables with the highest gain in the Jackknife test for each *Pireneitega* species. This figure indicates which environmental variables appear to have the most information when considered in isolation.

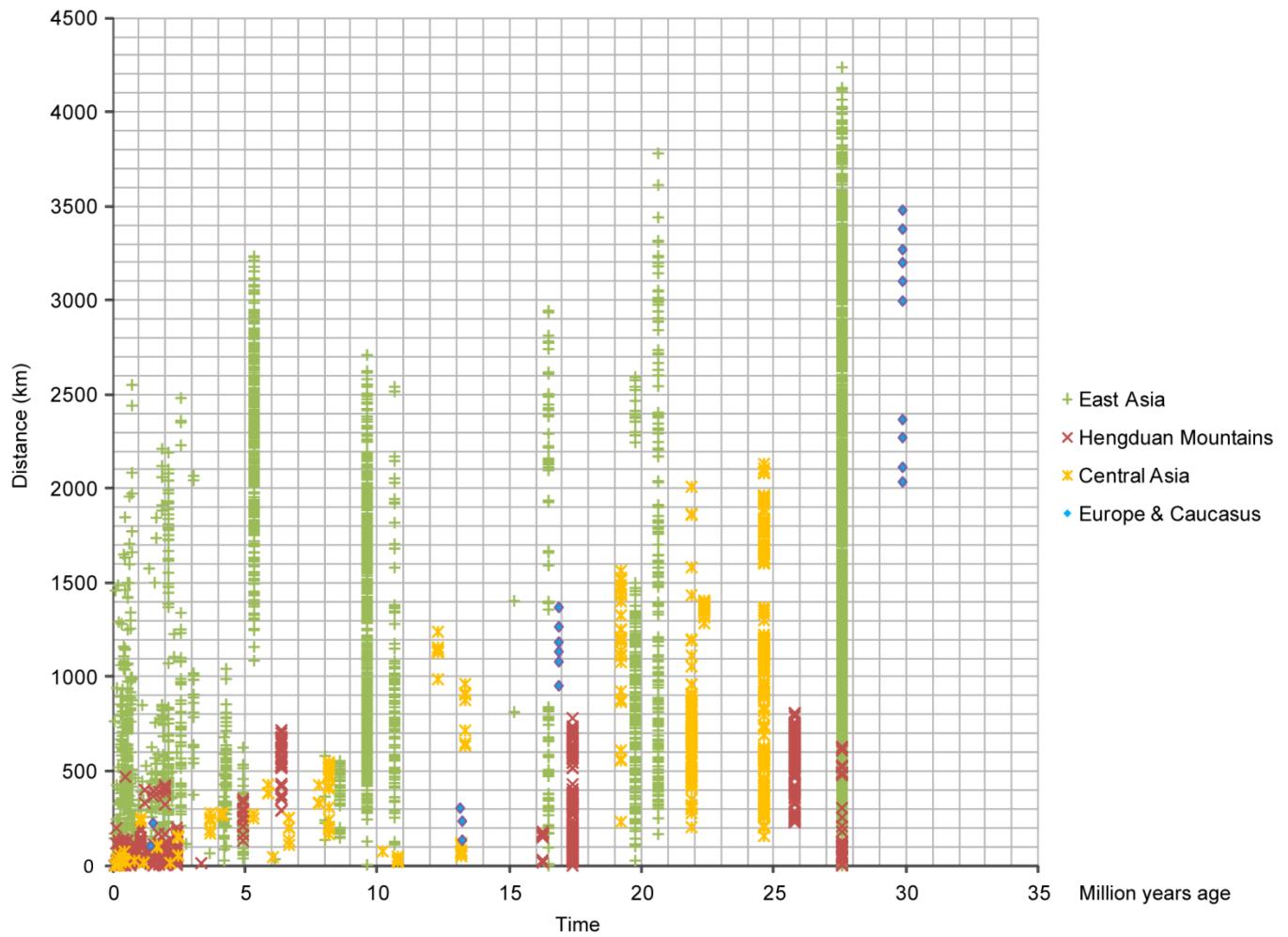


Fig. A5. The distribution of geographic distances (y axis) versus divergence time (x axis).

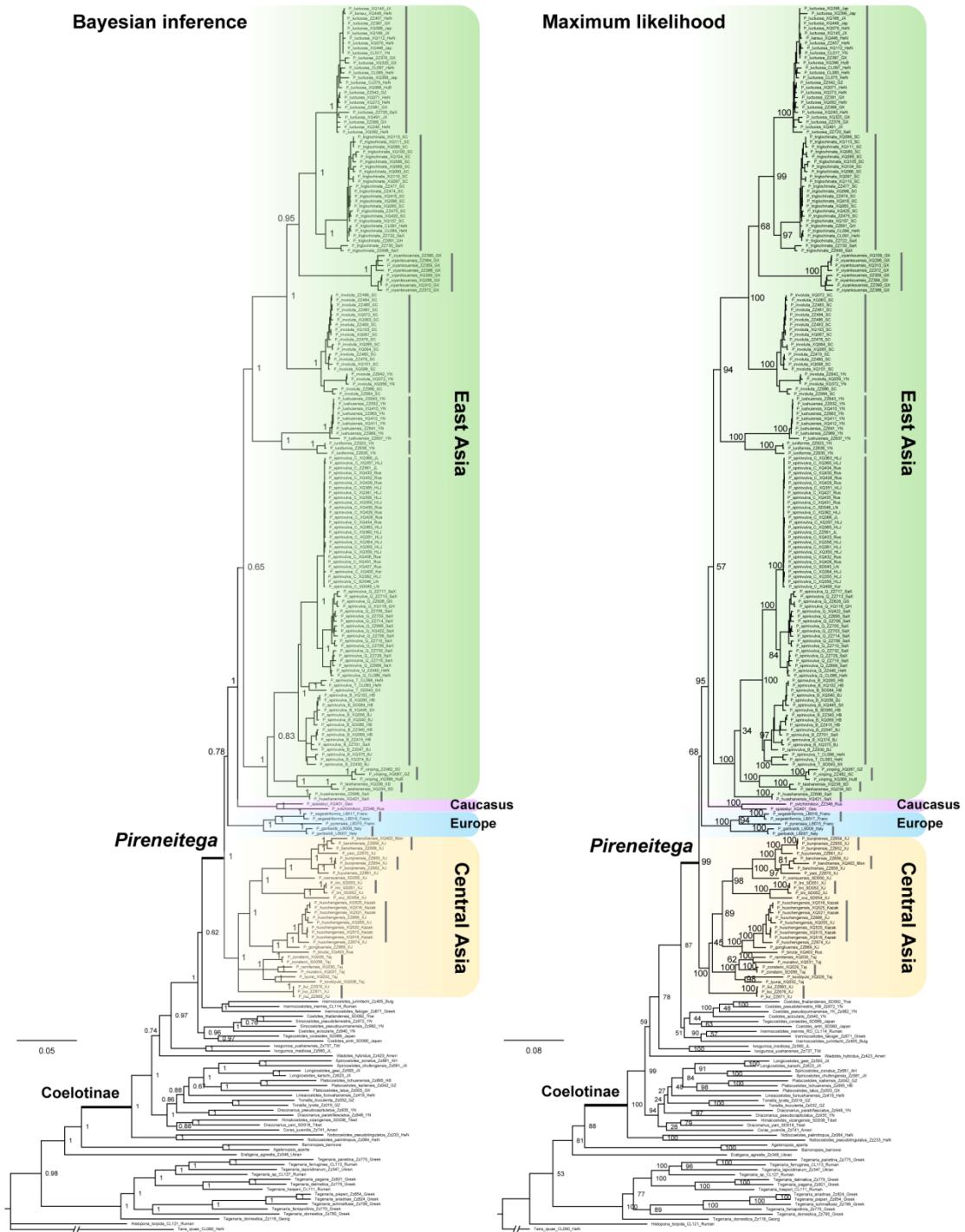


Fig. A6. The phylogenetic topologies obtained by Maximum-likelihood and Bayesian inference analyses based on the 248-taxa, 8 genes dataset. The support values for major nodes are shown on the trees. The scale bar corresponds to the expected number of substitutions per site.

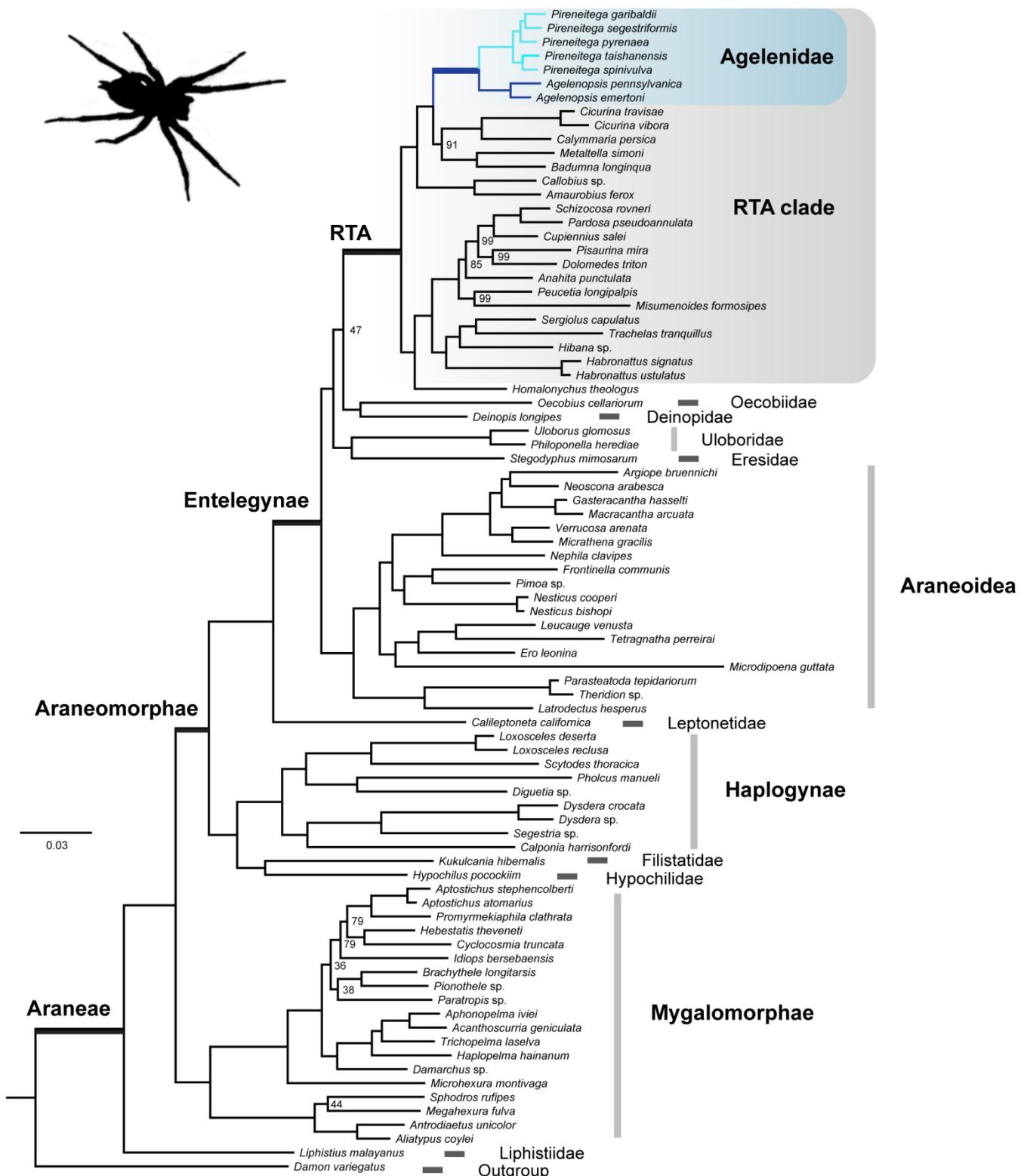


Fig. A7. Maximum-likelihood topology obtained from the 84-taxa transcriptome dataset.

Bootstrap values for each node are 100% unless otherwise noted. The scale bar corresponds to the expected number of substitutions per site.

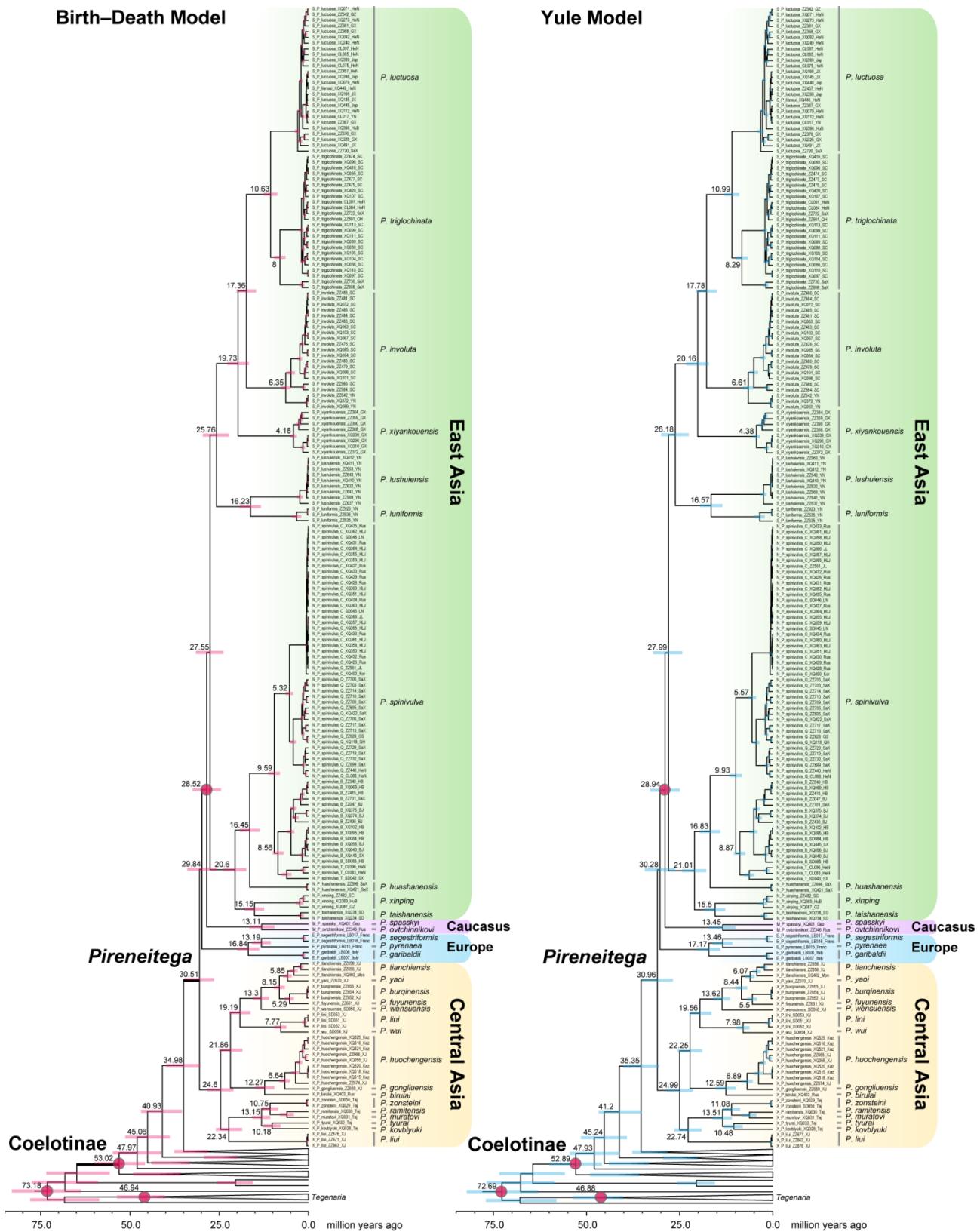


Fig. A8. Phylogenetic time trees inferred under both Birth–Death and Yule speciation processes in BEAST based on the 248-taxa (8 genes) datasets. The four calibration points are indicated by dots. The numbers show the mean ages of the nodes, and colored bars at nodes reflect the 95% confidence intervals of age estimates.

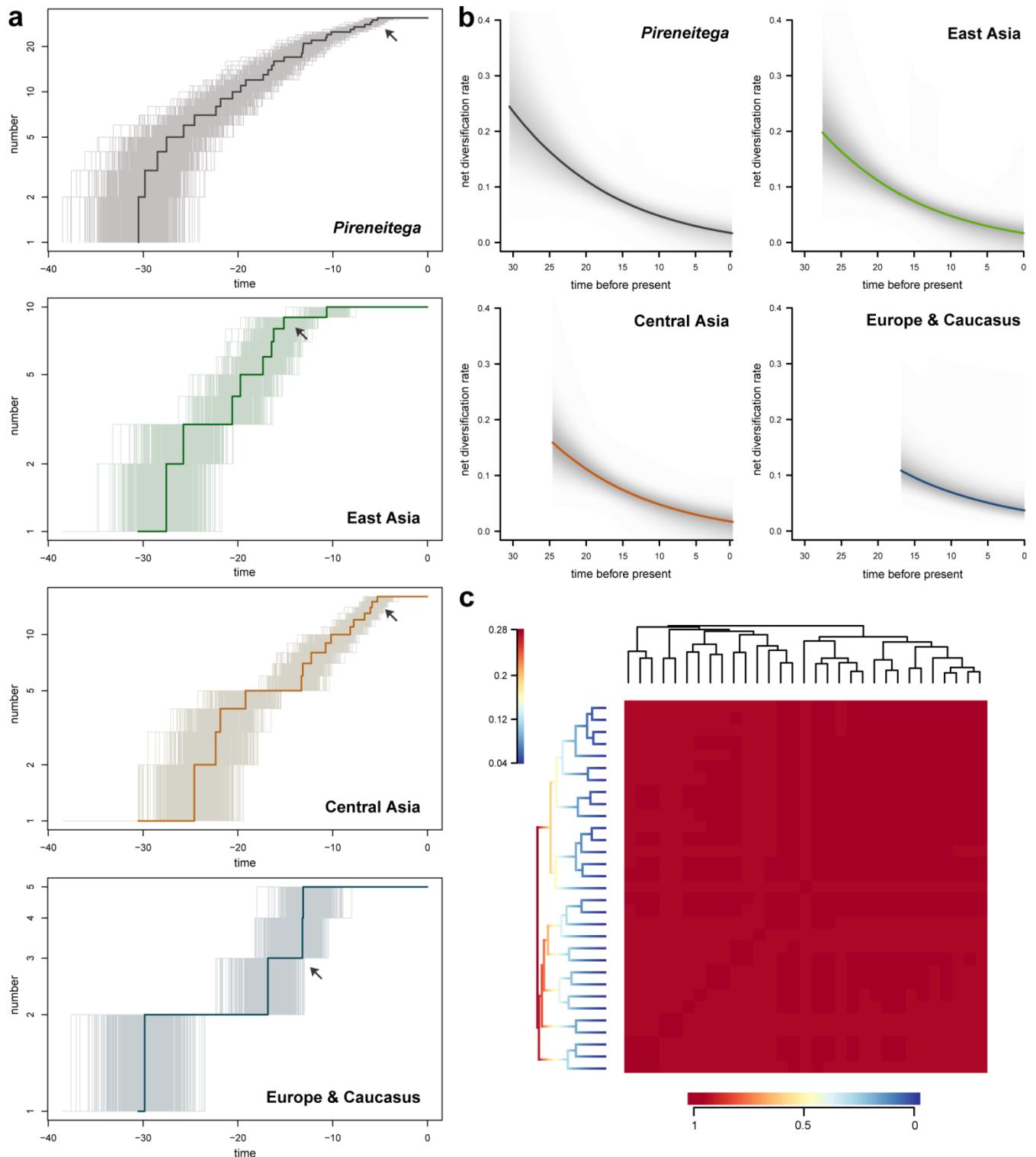


Fig. A9. Diversification rates analyses of lineages in *Pireneitega*. (a) The lineage-through-time (LTT) plot with 95% confidence intervals. The arrows show the rate shifts detected by TreePar; (b) The net diversification rates through time calculated by BAMM; (c) Macroevolutionary cohort analysis displays the pairwise probability that any two species share a common macroevolutionary rate dynamic. The color of the matrix at their intersection is the probability that those taxa share a common rate (red) dynamic or decoupled rate dynamics (blue). The tree on left shows the speciation rates (cool colors = slow, warm = fast) along each clade of the *Pireneitega* phylogeny, and there is no distinct rate shift.

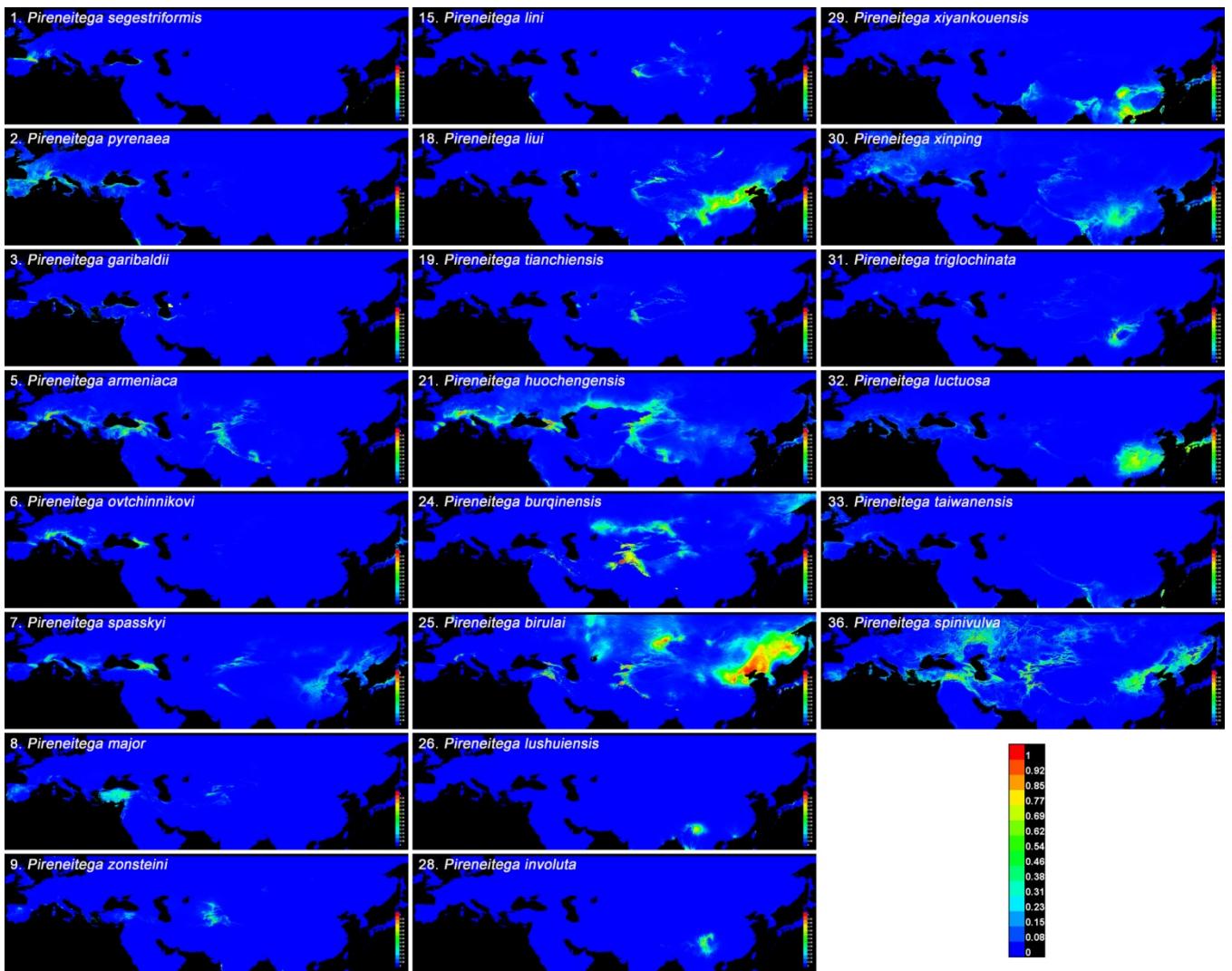


Fig. A10. The potential suitable habitat (mean) for each *Pireneitega* species predicted by MaxEnt. The colors indicate predicted probabilities that conditions are suitable, with red indicating a high probability of suitability, green indicating conditions typical of those where the species is found, and lighter shades of blue indicating low predicted probability.

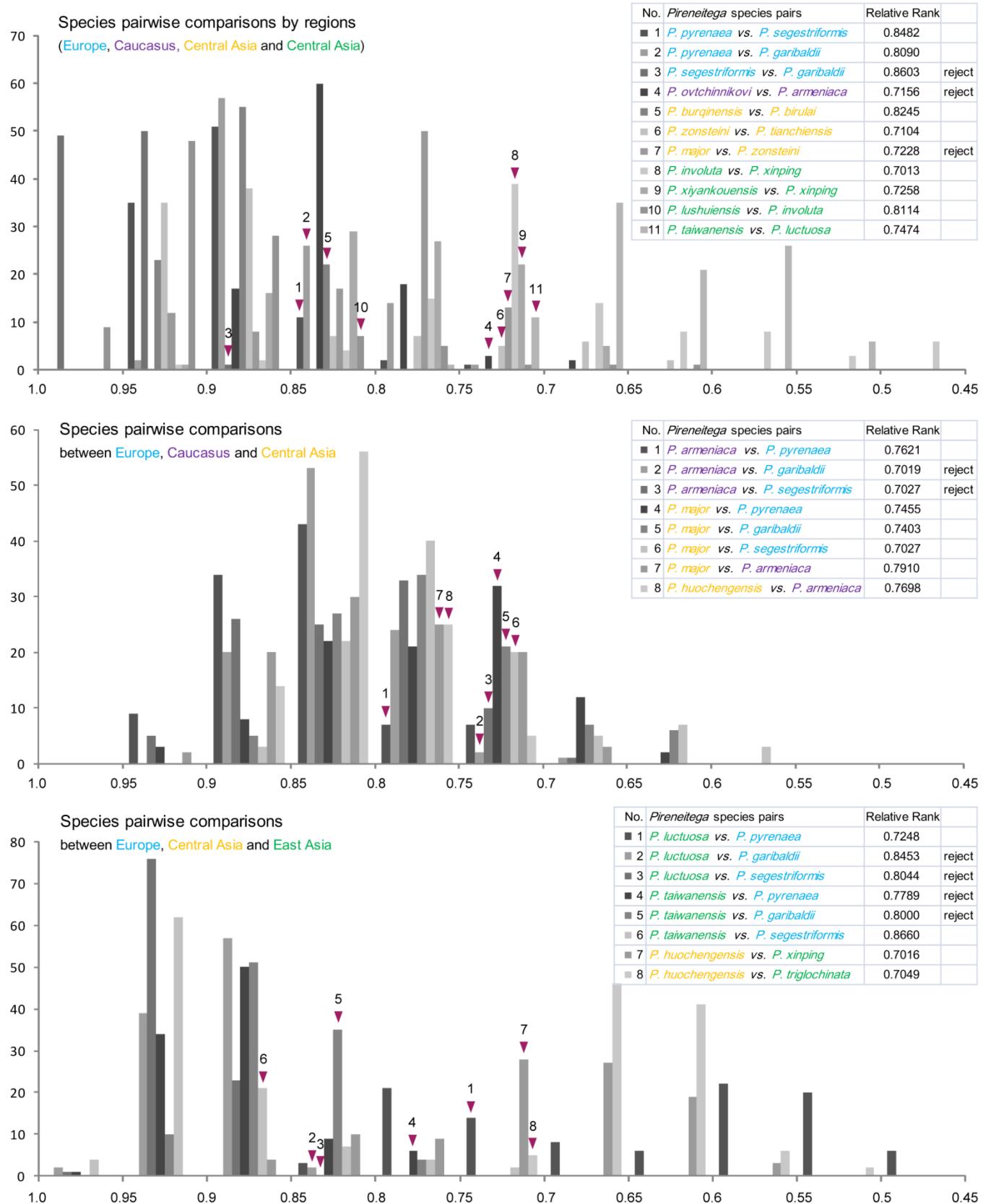


Fig. A11. Niche identity test based on 100 randomized pseudoreplicates, creating a null distribution for pair of species compared to obtained the relative rank (RR) values. If did not find the species distribution modeling statistically different (i.e. species are ecologically interchangeable), alternative species pairs showed statistical difference.

Table A1. The species names, geographical coordinates, DNA sequences and GenBank accession numbers of all Pireneitega samples and outgroups.

Sample number	Species	Coordinate		Alt (m)	DNA sequences and GenBank accession numbers							
		Latitude	longitude		12S	16S	18S	28S	co1	h3	nd1	wingless
CL017	<i>P. luctuosa</i>	27.64	104.04	908	MT117650	MT117236	MT117518	MT117377	MT116815	MT120332	MT120609	MT120482
CL083	<i>P. spinivulva</i>	35.73	113.63	709	MT117651	MT117237	MT117519	MT117378	MT116816	MT120333	MT120610	MT120483
CL084	<i>P. triglochinata</i>	34.26	111.85	1069	MT117652	MT117238	MT117520	MT117379	MT116817	MT120334	MT120611	MT120484
CL085	<i>P. luctuosa</i>	31.83	114.06	214	MT117653	MT117239	MT117521	MT117380	MT116818	MT120335	MT120612	MT120485
CL091	<i>P. triglochinata</i>	34.26	111.84	1101	MT117654	MT117240	MT117522	MT117381	MT116819	MT120336	MT120613	MT120486
CL096	<i>P. spinivulva</i>	36.16	113.72	648	MT117655	–	MT117523	MT117382	MT116820	MT120337	MT120614	MT120487
CL097	<i>P. luctuosa</i>	32.35	113.36	263	MT117656	MT117241	MT117524	MT117383	MT116821	MT120338	MT120615	MT120488
LB007	<i>P. garibaldii</i>	41.48	14.38	741	MT117657	MT117242	MT117525	MT117384	MT116822	MT120339	MT120616	MT120489
LB008	<i>P. garibaldii</i>	39.9	16.05	1067	MT117658	MT117243	MT117526	MT117385	MT116823	MT120340	MT120617	MT120490
LB015	<i>P. pyrenaea</i>	42.47	2.91	569	–	MT117244	MT117527	MT117386	MT116824	MT120341	MT120618	MT120491
LB016	<i>P. segestriformis</i>	42.95	1.39	899	–	MT117245	MT117528	MT117387	MT116825	MT120342	MT120619	MT120492
LB017	<i>P. segestriformis</i>	42.98	0.11	967	–	MT117246	MT117529	MT117388	MT116826	MT120343	MT120620	MT120493
SD046	<i>P. spinivulva</i>	40.43	124.07	149	MT117659	MT117247	MT117530	MT117389	MT116827	MT120344	MT120621	MT120494
SD052	<i>P. lini</i>	37.09	76.93	3280	–	–	MT117531	–	MT116828	–	–	–
SD053	<i>P. lini</i>	38.9	75.2	2846	–	MT117248	MT117532	MT117390	MT116829	MT120345	MT120622	MT120495
SD084	<i>P. spinivulva</i>	39.21	114.7	1874	MT117660	MT117249	MT117533	MT117391	MT116830	MT120346	MT120623	MT120496
SD085	<i>P. spinivulva</i>	38.57	114.02	309	MT117661	MT117250	MT117534	MT117392	MT116831	MT120347	MT120624	MT120497
XQ028	<i>P. kovblyuki</i>	38.3	69.23	1700	–	–	MT117535	MT117393	MT116832	MT120348	MT120625	–
XQ029	<i>P. zonsteini</i>	38.93	68.81	1530	–	MT117251	MT117536	MT117394	MT116833	MT120349	MT120626	MT120498
XQ030	<i>P. ramitensis</i>	38.74	69.31	1324	–	MT117252	MT117537	MT117395	MT116834	MT120350	–	MT120499
XQ031	<i>P. muratovi</i>	38.74	68.79	–	–	MT117253	MT117538	MT117396	MT116835	MT120351	MT120627	MT120500
XQ032	<i>P. tyurai</i>	38.47	70.07	1854	–	–	MT117539	MT117397	MT116836	MT120352	MT120628	–
XQ040	<i>P. spinivulva</i>	39.96	115.44	1225	–	–	–	–	MT116837	–	–	–
XQ055	<i>P. huochengensis</i>	44.46	81.16	–	–	–	–	–	MT116838	–	–	–
XQ056	<i>P. spinivulva</i>	39.98	115.53	1070	–	–	–	–	MT116839	–	–	–
XQ059	<i>P. involuta</i>	24.07	101.99	1800	–	–	–	–	MT116840	–	–	–
XQ063	<i>P. involuta</i>	30.38	102.28	–	MT117662	–	–	–	MT116841	–	MT120629	–
XQ064	<i>P. involuta</i>	29.87	102.35	–	–	MT117254	–	–	MT116842	MT120353	MT120630	–
XQ065	<i>P. triglochinata</i>	30.31	101.53	–	–	MT117255	–	–	MT116843	–	MT120631	–
XQ066	<i>P. triglochinata</i>	30.41	102.75	–	MT117663	–	–	–	MT116844	MT120354	–	–
XQ067	<i>P. involuta</i>	30.39	102.06	–	–	MT117256	–	–	MT116845	MT120355	MT120632	–
XQ069	<i>P. spinivulva</i>	37.45	114.04	–	MT117664	–	MT117540	–	MT116846	–	MT120633	MT120501
XQ071	<i>P. luctuosa</i>	29.39	110.16	–	–	–	–	–	MT116847	MT120356	–	MT120502
XQ072	<i>P. involuta</i>	29.63	102.13	–	–	MT117257	–	–	MT116848	–	–	–
XQ079	<i>P. luctuosa</i>	28.23	112.95	–	–	–	–	–	MT116849	–	–	–
XQ080	<i>P. triglochinata</i>	31.04	103.07	–	–	–	–	–	MT116850	–	–	–
XQ085	<i>P. involuta</i>	30.14	102.92	–	–	–	–	–	MT116851	MT120357	–	–
XQ087	<i>P. xiping</i>	27.05	106.85	–	MT117665	–	–	–	MT116852	MT120358	–	–
XQ089	<i>P. triglochinata</i>	26.89	102.11	–	–	–	–	–	MT116853	–	–	–
XQ092	<i>P. luctuosa</i>	29.38	110.49	–	MT117666	MT117258	–	MT117398	MT116854	MT120359	–	–
XQ095	<i>P. spinivulva</i>	39.23	114.66	–	MT117667	MT117259	–	MT117399	MT116855	MT120360	–	–
XQ096	<i>P. triglochinata</i>	30.68	102.71	–	MT117668	MT117260	–	–	MT116856	–	–	–
XQ097	<i>P. triglochinata</i>	30.06	102.75	–	–	–	–	MT117400	MT116857	MT120361	–	MT120503
XQ098	<i>P. involuta</i>	30.11	101.79	–	–	MT117261	MT117541	MT117401	MT116858	MT120362	–	MT120504
XQ099	<i>P. triglochinata</i>	30.41	102.75	–	–	MT117262	–	MT117402	MT116859	MT120363	–	MT120505
XQ101	<i>P. involuta</i>	30.53	102.01	–	MT117669	MT117263	–	MT117403	MT116860	MT120364	MT120634	–
XQ102	<i>P. spinivulva</i>	39.35	114.71	–	MT117670	MT117264	–	MT117404	MT116861	MT120365	MT120635	–
XQ103	<i>P. involuta</i>	30.07	101.95	–	–	MT117265	–	MT117405	MT116862	MT120366	MT120636	MT120506
XQ104	<i>P. triglochinata</i>	30.18	102.42	–	–	MT117266	–	MT117406	MT116863	MT120367	–	MT120507
XQ105	<i>P. triglochinata</i>	30.36	102.81	–	MT117671	MT117267	–	–	MT116864	–	–	–
XQ107	<i>P. triglochinata</i>	30.46	102.92	–	–	MT117268	–	MT117407	MT116865	MT120368	MT120637	MT120508
XQ110	<i>P. triglochinata</i>	30.38	102.71	–	MT117672	MT117269	–	–	MT116866	–	–	–
XQ111	<i>P. triglochinata</i>	30.47	102.7	–	MT117673	MT117270	–	–	MT116867	MT120369	MT120638	–
XQ112	<i>P. luctuosa</i>	27.25	112.7	–	MT117674	MT117271	MT117542	MT117408	MT116868	MT120370	–	MT120509
XQ113	<i>P. triglochinata</i>	29.87	102.35	–	–	MT117272	–	–	MT116869	MT120371	–	–
XQ118	<i>P. spinivulva</i>	36.61	101.77	–	–	–	–	MT116870	–	–	–	–
XQ145	<i>P. luctuosa</i>	27.91	114.19	152	MT117675	–	MT117543	MT117409	MT116871	MT120372	MT120639	MT120510
XQ166	<i>P. luctuosa</i>	27.73	113.82	135	MT117676	MT117273	MT117544	MT117410	MT116872	MT120373	MT120640	MT120511
XQ234	<i>P. taishanensis</i>	36.24	117.11	744	MT117677	MT117274	MT117545	MT117411	MT116873	MT120374	MT120641	–
XQ238	<i>P. taishanensis</i>	36.06	117.26	597	MT117678	MT117275	MT117546	MT117412	MT116874	MT120375	MT120642	MT120512
XQ240	<i>P. luctuosa</i>	29.94	110.86	395	MT117679	MT117276	MT117547	MT117413	MT116875	MT120376	–	MT120513
XQ273	<i>P. luctuosa</i>	29.09	110.9	329	MT117680	MT117277	MT117548	MT117414	MT116876	MT120377	MT120643	MT120514
XQ296	<i>P. xiyanouensis</i>	24.44	107.35	385	MT117681	MT117278	MT117549	MT117415	MT116877	MT120378	MT120644	MT120515
XQ310	<i>P. xiyanouensis</i>	25.04	107.42	559	MT117682	MT117279	MT117550	MT117416	MT116878	MT120379	MT120645	MT120516

XQ325	<i>P. luctuosa</i>	25.28	107.45	880	MT117683	MT117280	MT117551	MT117417	MT116879	MT120380	MT120646	MT120517
XQ339	<i>P. xiyanouensis</i>	24.36	107.39	383	MT117684	MT117281	MT117552	MT117418	MT116880	MT120381	MT120647	MT120518
XQ350	<i>P. spinivulva</i>	44.43	131.15	503	MT117685	MT117282	MT117553	MT117419	MT116881	MT120382	MT120648	—
XQ351	<i>P. spinivulva</i>	46.79	134.02	77	MT117686	MT117283	MT117554	MT117420	MT116882	MT120383	MT120649	MT120519
XQ355	<i>P. spinivulva</i>	47.7	128.91	324	MT117687	MT117284	MT117555	MT117421	MT116883	MT120384	MT120650	MT120520
XQ357	<i>P. spinivulva</i>	47.74	128.89	250	MT117688	MT117285	MT117556	MT117422	MT116884	MT120385	MT120651	MT120521
XQ358	<i>P. spinivulva</i>	46.64	131.16	212	MT117689	MT117286	MT117557	MT117423	MT116885	MT120386	MT120652	MT120522
XQ359	<i>P. spinivulva</i>	49.1	129.76	—	MT117690	MT117287	MT117558	MT117424	MT116886	MT120387	MT120653	MT120523
XQ360	<i>P. spinivulva</i>	46.58	133.65	168	MT117691	MT117288	MT117559	MT117425	MT116887	MT120388	MT120654	—
XQ361	<i>P. spinivulva</i>	44.98	131.18	271	MT117692	MT117289	MT117560	—	MT116888	MT120389	MT120655	MT120524
XQ362	<i>P. spinivulva</i>	44.38	130.97	443	MT117693	MT117290	MT117561	MT117426	MT116889	MT120390	MT120656	MT120525
XQ363	<i>P. spinivulva</i>	46.89	133.81	147	MT117694	MT117291	MT117562	MT117427	MT116890	MT120391	MT120657	MT120526
XQ364	<i>P. spinivulva</i>	47.61	129.21	—	MT117695	MT117292	MT117563	MT117428	MT116891	MT120392	MT120658	MT120527
XQ365	<i>P. spinivulva</i>	44.06	128.94	353	MT117696	MT117293	MT117564	MT117429	MT116892	MT120393	MT120659	MT120528
XQ366	<i>P. spinivulva</i>	44.21	131.08	175	MT117697	MT117294	MT117565	MT117430	MT116893	MT120394	MT120660	MT120529
XQ369	<i>P. xinping</i>	31.48	110.39	1233	MT117698	MT117295	MT117566	MT117431	MT116894	MT120395	MT120661	MT120530
XQ372	<i>P. involuta</i>	24.97	102.62	2046	MT117699	MT117296	MT117567	MT117432	MT116895	MT120396	MT120662	MT120531
XQ374	<i>P. spinivulva</i>	40.36	115.99	215	MT117700	MT117297	MT117568	MT117433	MT116896	MT120397	MT120663	MT120532
XQ375	<i>P. spinivulva</i>	40.01	116.2	137	MT117701	MT117298	MT117569	MT117434	MT116897	MT120398	MT120664	MT120533
XQ396	<i>P. luctuosa</i>	31.48	110.39	1233	MT117702	—	MT117570	MT117435	MT116898	MT120399	MT120665	MT120534
XQ398	<i>P. luctuosa</i>	32.7	128.8	—	MT117703	MT117299	MT117571	MT117436	MT116899	MT120400	MT120666	MT120535
XQ399	<i>P. luctuosa</i>	32.84	130.19	—	—	MT117300	—	MT117437	—	MT120401	—	—
XQ400	<i>P. spinivulva</i>	40.3	127.5	—	MT117704	MT117301	—	—	MT116900	MT120402	MT120667	MT120536
XQ401	<i>P. spasskyi</i>	42.29	43.07	341	—	MT117302	MT117572	MT117438	MT116901	MT120403	—	MT120537
XQ402	<i>P. tianchiensis</i>	45.22	90.9	3050	—	MT117303	—	MT117439	MT116902	—	MT120668	—
XQ403	<i>P. birulai</i>	54.38	84.57	200	MT117705	—	—	MT117440	MT116903	MT120404	—	—
XQ410	<i>P. lushuiensis</i>	24.83	98.77	2146	—	MT117304	MT117573	MT117441	MT116904	MT120405	MT120669	MT120538
XQ411	<i>P. lushuiensis</i>	26	98.63	2257	—	MT117305	MT117574	MT117442	MT116905	MT120406	MT120670	MT120539
XQ412	<i>P. lushuiensis</i>	25.99	98.66	2337	—	MT117306	MT117575	MT117443	MT116906	MT120407	MT120671	—
XQ416	<i>P. triglochinata</i>	29.57	103.41	858	MT117706	MT117307	MT117576	MT117444	MT116907	MT120408	MT120672	MT120540
XQ420	<i>P. triglochinata</i>	29.57	103.41	834	MT117707	MT117308	MT117577	MT117445	MT116908	MT120409	MT120673	MT120541
XQ421	<i>P. huashanensis</i>	34.54	110.12	536	MT117708	MT117309	MT117578	MT117446	MT116909	—	MT120674	MT120542
XQ422	<i>P. spinivulva</i>	34.54	110.12	536	MT117709	MT117310	MT117579	MT117447	MT116910	MT120410	MT120675	MT120543
XQ426	<i>P. spinivulva</i>	49.49	136.85	68	MT117710	MT117311	MT117580	MT117448	MT116911	MT120411	MT120676	MT120544
XQ427	<i>P. spinivulva</i>	48.59	135.53	—	—	MT117312	MT117581	MT117449	MT116912	MT120412	MT120677	MT120545
XQ428	<i>P. spinivulva</i>	46.94	134.32	121	MT117711	MT117313	MT117582	MT117450	MT116913	MT120413	MT120678	MT120546
XQ429	<i>P. spinivulva</i>	46.18	133.98	66	MT117712	MT117314	—	MT117451	MT116914	MT120414	MT120679	MT120547
XQ430	<i>P. spinivulva</i>	47.42	134.59	74	MT117713	MT117315	MT117583	MT117452	MT116915	MT120415	MT120680	MT120548
XQ431	<i>P. spinivulva</i>	51.11	138.62	60	MT117714	MT117316	MT117584	MT117453	MT116916	MT120416	MT120681	MT120549
XQ432	<i>P. spinivulva</i>	50.19	137.4	63	—	MT117317	MT117585	MT117454	MT116917	MT120417	MT120682	MT120550
XQ433	<i>P. spinivulva</i>	43.57	131.97	17	MT117715	MT117318	MT117586	MT117455	MT116918	MT120418	MT120683	MT120551
XQ434	<i>P. spinivulva</i>	47.47	134.64	67	MT117716	MT117319	MT117587	MT117456	MT116919	MT120419	MT120684	MT120552
XQ435	<i>P. spinivulva</i>	49.88	137.04	60	MT117717	MT117320	MT117588	MT117457	MT116920	MT120420	MT120685	MT120553
XQ445	<i>P. spinivulva</i>	38.82	112.09	1613	MT117718	MT117321	MT117589	MT117458	MT116921	MT120421	MT120686	MT120554
XQ446	<i>P. liansui</i>	25.53	111.6	168	MT117719	MT117322	MT117590	MT117459	MT116922	MT120422	MT120687	MT120555
XQ448	<i>P. luctuosa</i>	32.94	129.95	—	—	—	—	MT116923	—	—	—	—
XQ491	<i>P. luctuosa</i>	29.48	117.61	350	MT117720	—	MT117591	MT117460	MT116924	—	MT120688	MT120556
XQ515	<i>P. huochengensis</i>	44.73	79.32	2150	MT117721	MT117323	MT117592	MT117461	MT116925	MT120423	MT120689	MT120557
XQ516	<i>P. huochengensis</i>	44.55	79.93	2400	MT117722	MT117324	MT117593	MT117462	MT116926	MT120424	MT120690	—
XQ518	<i>P. huochengensis</i>	44.72	79.3	3000	MT117723	MT117325	MT117594	MT117463	MT116927	MT120425	—	MT120558
XQ520	<i>P. huochengensis</i>	44.72	79.32	2900	—	MT117326	MT117595	MT117464	MT116928	MT120426	MT120691	—
XQ521	<i>P. huochengensis</i>	44.43	79.86	1320	MT117724	MT117327	MT117596	MT117465	MT116929	MT120427	MT120692	—
XQ525	<i>P. huochengensis</i>	44.57	79.95	3000	MT117725	MT117328	MT117597	MT117466	MT116930	MT120428	MT120693	—
ZZ047	<i>P. spinivulva</i>	40.26	116.22	100	MT117726	MT117329	MT117598	MT117467	MT116931	MT120429	MT120694	MT120559
ZZ340	<i>P. spinivulva</i>	34.44	114.03	1200	—	—	MT117599	—	MT116932	MT120430	MT120695	MT120560
ZZ359	<i>P. xiyanouensis</i>	22.97	107.47	248	MT117727	MT117330	MT117600	MT117468	MT116933	MT120431	MT120696	MT120561
ZZ376	<i>P. luctuosa</i>	24.79	106.37	1044	MT117728	MT117331	MT117601	MT117469	MT116934	MT120432	MT120697	MT120562
ZZ381	<i>P. luctuosa</i>	25.57	110.62	200	MT117729	MT117332	MT117602	MT117470	MT116935	MT120433	MT120698	MT120563
ZZ384	<i>P. xiyanouensis</i>	23.17	106.67	596	MT117730	MT117333	MT117603	MT117471	MT116936	MT120434	MT120699	MT120564
ZZ387	<i>P. luctuosa</i>	25.3	110.3	156	MT117731	MT117334	—	MT117472	MT116937	MT120435	MT120700	MT120565
ZZ388	<i>P. xiyanouensis</i>	22.13	106.77	326	MT117732	MT117335	MT117604	—	MT116938	MT120436	MT120701	MT120566
ZZ390	<i>P. xiyanouensis</i>	23.11	107.08	457	MT117733	MT117336	MT117605	MT117473	MT116939	MT120437	MT120702	MT120567
ZZ430	<i>P. spinivulva</i>	39.64	115.6	—	MT117734	—	MT117606	MT117474	MT116940	MT120438	MT120703	MT120568
ZZ440	<i>P. spinivulva</i>	33.35	111.88	320	MT117735	MT117337	MT117607	MT117475	MT116941	MT120439	MT120704	—
ZZ457	<i>P. luctuosa</i>	28.42	114.07	—	—	MT117338	MT117608	MT117476	MT116942	MT120440	MT120705	MT120569
ZZ475	<i>P. triglochinata</i>	30.29	102.8	1187	MT117736	MT117339	MT117609	MT117477	MT116943	MT120441	MT120706	MT120570
ZZ476	<i>P. involuta</i>	28.74	102.23	2287	MT117737	—	MT117610	MT117478	MT116944	MT120442	MT120707	MT120571
ZZ477	<i>P. triglochinata</i>	30.56	102.89	1600	MT117738	MT117340	MT117611	MT117479	MT116945	MT120443	MT120708	MT120572
ZZ479	<i>P. involuta</i>	30	101.95	2760	MT117739	MT117341	MT117612	MT117480	MT116946	MT120444	MT120709	MT120573

ZZ480	<i>P. involuta</i>	30.04	101.96	—	MT117740	MT117342	MT117613	MT117481	MT116947	MT120445	MT120710	MT120574
ZZ481	<i>P. involuta</i>	29.7	102.02	2375	—	MT117343	MT117614	MT117482	MT116948	MT120446	MT120711	MT120575
ZZ484	<i>P. involuta</i>	29.61	102.09	1858	—	MT117344	MT117615	MT117483	MT116949	MT120447	MT120712	MT120576
ZZ485	<i>P. involuta</i>	29.63	102.11	1685	—	MT117345	MT117616	MT117484	MT116950	MT120448	MT120713	MT120577
ZZ486	<i>P. involuta</i>	29.63	102.11	1685	MT117741	MT117346	MT117617	MT117485	MT116951	MT120449	MT120714	MT120578
ZZ542	<i>P. luctuosa</i>	27.05	108.19	680	MT117742	MT117347	MT117618	MT117486	MT116952	MT120450	MT120715	MT120579
ZZ561	<i>P. spinivulva</i>	41.71	125.92	427	MT117743	MT117348	MT117619	MT117487	MT116953	MT120451	MT120716	MT120580
ZZ636	<i>P. luniformis</i>	25.59	100.2	2145	MT117744	MT117349	MT117620	MT117488	MT116954	MT120452	MT120717	MT120581
ZZ641	<i>P. lushuiensis</i>	26	98.66	2422	—	MT117350	MT117621	MT117489	MT116955	MT120453	MT120718	MT120582
ZZ643	<i>P. lushuiensis</i>	24.83	98.77	2177	—	MT117351	MT117622	MT117490	MT116956	MT120454	MT120719	MT120583
ZZ654	<i>P. burqinensis</i>	48.7	87	1415	MT117745	MT117352	MT117623	MT117491	MT116957	MT120455	MT120720	MT120584
ZZ655	<i>P. burqinensis</i>	48.39	86.75	1258	MT117746	—	MT117624	MT117492	MT116958	MT120456	MT120721	MT120585
ZZ656	<i>P. tianchiensis</i>	43.82	87.98	1690	MT117747	—	MT117625	MT117493	MT116959	MT120457	MT120722	MT120586
ZZ671	<i>P. liui</i>	43.61	84.33	2384	MT117748	MT117353	MT117626	MT117494	MT116960	MT120458	MT120723	—
ZZ674	<i>P. huochengensis</i>	45.58	82.63	1658	MT117749	MT117354	MT117627	MT117495	MT116961	MT120459	—	MT120587
ZZ676	<i>P. liui</i>	43.84	83.7	2391	—	MT117355	MT117628	MT117496	MT116962	MT120460	MT120724	MT120588
ZZ695	<i>P. spinivulva</i>	34.53	110.12	530	MT117750	MT117356	MT117629	MT117497	MT116963	MT120461	MT120725	MT120589
ZZ699	<i>P. spinivulva</i>	33.99	109.2	1046	MT117751	MT117357	MT117630	MT117498	MT116964	MT120462	MT120726	MT120590
ZZ701	<i>P. spinivulva</i>	39.01	110.67	1212	MT117752	MT117358	MT117631	MT117499	MT116965	MT120463	MT120727	MT120591
ZZ703	<i>P. spinivulva</i>	37.81	108.93	1200	MT117753	MT117359	MT117632	MT117500	MT116966	MT120464	MT120728	MT120592
ZZ705	<i>P. spinivulva</i>	39	110.62	1154	MT117754	MT117360	MT117633	MT117501	MT116967	MT120465	MT120729	MT120593
ZZ706	<i>P. spinivulva</i>	37.17	108.03	1391	MT117755	MT117361	MT117634	MT117502	MT116968	MT120466	MT120730	MT120594
ZZ709	<i>P. spinivulva</i>	36.79	108.01	1355	MT117756	MT117362	MT117635	MT117503	MT116969	MT120467	MT120731	MT120595
ZZ710	<i>P. spinivulva</i>	36.98	108.43	1387	MT117757	MT117363	MT117636	MT117504	MT116970	MT120468	MT120732	MT120596
ZZ713	<i>P. spinivulva</i>	36.94	108.87	1160	MT117758	MT117364	MT117637	MT117505	MT116971	MT120469	MT120733	MT120597
ZZ714	<i>P. spinivulva</i>	37.25	110.14	1040	—	MT117365	MT117638	MT117506	MT116972	MT120470	MT120734	MT120598
ZZ717	<i>P. spinivulva</i>	36.06	110.21	807	MT117759	MT117366	MT117639	MT117507	MT116973	MT120471	MT120735	MT120599
ZZ719	<i>P. spinivulva</i>	34.13	107.91	638	MT117760	MT117367	MT117640	MT117508	MT116974	MT120472	MT120736	MT120600
ZZ720	<i>P. luctuosa</i>	34.13	107.91	638	MT117761	MT117368	MT117641	MT117509	MT116975	MT120473	MT120737	MT120601
ZZ722	<i>P. triglochinata</i>	33.67	106.83	1352	MT117762	MT117369	MT117642	MT117510	MT116976	MT120474	MT120738	MT120602
ZZ729	<i>P. spinivulva</i>	33.25	107.05	1074	MT117763	MT117370	MT117643	MT117511	MT116977	MT120475	MT120739	MT120603
ZZ730	<i>P. triglochinata</i>	33.11	108.14	489	MT117764	MT117371	MT117644	MT117512	MT116978	MT120476	MT120740	MT120604
ZZ732	<i>P. spinivulva</i>	32.3	108.91	529	MT117765	MT117372	MT117645	MT117513	MT116979	MT120477	MT120741	MT120605
ZZ923	<i>P. luniformis</i>	25.61	100.24	1992	MT117766	MT117373	MT117646	MT117514	MT116980	MT120478	MT120742	—
ZZ963	<i>P. lushuiensis</i>	24.97	98.87	1881	—	MT117374	MT117647	MT117515	MT116981	MT120479	MT120743	MT120606
ZZ969	<i>P. lushuiensis</i>	25.49	98.54	1797	—	MT117375	MT117648	MT117516	MT116982	MT120480	MT120744	MT120607
ZZ986	<i>P. involuta</i>	27.92	101.27	2229	MT117767	MT117376	MT117649	MT117517	MT116983	MT120481	MT120745	MT120608
CL075	<i>P. luctuosa</i>	31.9	114.24	254	KY792023	KY791724	KY791423	KY791121	KY778988	KY779268	KY790828	KY779538
CL086	<i>P. spinivulva</i>	31.83	114.06	214	KY792012	KY791713	KY791412	KY791110	KY778980	KY779257	KY790817	KY779527
SD043	<i>P. spinivulva</i>	35.91	113.51	808	KY792013	KY791714	KY791413	KY791111	KY778981	KY779258	KY790818	KY779528
SD045	<i>P. spinivulva</i>	41.02	123.12	211	KY792014	KY791715	KY791414	KY791112	KY778982	KY779259	KY790819	KY779529
SD050	<i>P. wensuensis</i>	41.74	80.72	1991	KY792028	KY791729	KY791428	KY791126	KX011864	KY779273	KY790833	KY779543
SD051	<i>P. lini</i>	38.81	75.39	2165	KY792029	KY791730	KY791429	KY791127	KX011865	KY779274	KY790834	KY779544
SD054	<i>P. wui</i>	40.79	78.25	3020	KY792030	KY791731	KY791430	KY791128	KX011866	KY779275	KY790835	KY779545
SD056	<i>P. zonsteini</i>	38.84	68.96	1778	—	KY791735	KY791434	KY791132	KY778994	KY779279	KY790839	KY779549
ZZ346	<i>P. ovchinnikovi</i>	44	40.13	670	KY792010	KY791711	KY791410	KY791108	KY778978	KY779255	KY790815	KY779525
ZZ368	<i>P. luctuosa</i>	25.22	110.15	158	KY792005	KY791706	KY791405	KY791103	KY778973	KY779250	KY790810	KY779520
ZZ372	<i>P. xiyanquensis</i>	24.49	108.57	110	KY792015	KY791716	KY791415	KY791113	KY593331	KY779260	KY790820	KY779530
ZZ415	<i>P. spinivulva</i>	37.5	114.11	720	KY792011	KY791712	KY791411	KY791109	KY778979	KY779256	KY790816	KY779526
ZZ474	<i>P. triglochinata</i>	30.38	102.81	994	KY792006	KY791707	KY791406	KY791104	KY778974	KY779251	KY790811	KY779521
ZZ482	<i>P. xiping</i>	29.64	102.13	1673	KY792017	KY791718	KY791417	KY791115	KY778984	KY779262	KY790822	KY779532
ZZ483	<i>P. involuta</i>	29.64	102.13	1673	KY792018	KY791719	KY791418	KY791116	KY778985	KY779263	KY790823	KY779533
ZZ628	<i>P. spinivulva</i>	35.93	103.88	2075	KY792009	KY791710	KY791409	KY791107	KY778977	KY779254	KY790814	KY779524
ZZ632	<i>P. lushuiensis</i>	24.97	98.61	2032	KY792019	KY791720	KY791419	KY791117	KY778986	KY779264	KY790824	KY779534
ZZ635	<i>P. luniformis</i>	25.69	100.16	2089	KY792007	KY791708	KY791407	KY791105	KY778975	KY779252	—	KY779522
ZZ637	<i>P. lushuiensis</i>	25.48	100.34	2157	KY792008	KY791709	KY791408	KY791106	KY778976	KY779253	KY790813	KY779523
ZZ642	<i>P. involuta</i>	24.95	102.64	2437	KY792004	KY791705	KY791404	KY791102	KY778972	KY779249	KY790809	KY779519
ZZ652	<i>P. burqinensis</i>	48.52	87.19	1469	KY792036	KY791737	KY791436	KY791134	KX011867	KY779281	KY790841	KY779551
ZZ658	<i>P. tianchiensis</i>	43.9	88.12	1878	KY792037	KY791738	KY791437	KY791135	KY778995	KY779282	KY790842	KY779552
ZZ661	<i>P. fuyunensis</i>	47.32	90.03	1355	KY792033	KY791734	KY791433	KY791131	KX011859	KY779278	KY790838	KY779548
ZZ663	<i>P. liui</i>	43.37	84.36	2010	KY792035	KY791736	KY791435	KY791133	KX011860	KY779280	KY790840	KY779550
ZZ666	<i>P. huochengensis</i>	44.22	81.17	987	KY792020	KY791721	KY791420	KY791118	KX011861	KY779265	KY790825	KY779535
ZZ669	<i>P. gongliuensis</i>	43.37	81.86	1515	KY792022	KY791723	KY791422	KY791120	KX011862	KY779267	KY790827	KY779537
ZZ670	<i>P. yaoi</i>	46.99	85.96	1858	KY792032	KY791733	KY791432	KY791130	KX011863	KY779277	KY790837	KY779547
ZZ691	<i>P. triglochinata</i>	35.79	102.68	2491	KY792024	KY791725	KY791424	KY791122	KY778989	KY779269	KY790829	KY779539
ZZ696	<i>P. huashanensis</i>	34.51	110.03	530	KY792025	KY791726	KY791425	KY791123	KY778990	KY779270	KY790830	KY779540
ZZ698	<i>P. triglochinata</i>	33.93	109.26	1137	KY792026	KY791727	KY791426	KY791124	KY778991	KY779271	KY790831	KY779541
ZZ984	<i>P. involuta</i>	27.4	101.53	2620	KY792027	KY791728	KY791427	KY791125	KY778992	KY779272	KY790832	KY779542
CL114	<i>Inermocoelotes inermis</i>	45.07	22.76	358	KY792042	KY791743	KY791442	KY791140	KY779000	KY779287	KY790847	KY779556

SD018	<i>Draconarius yani</i>	28.58	98.12	3680	KY791867	KY791568	KY791267	KY790967	KY778855	KY779112	KY790676	KY779394
SD036	<i>Himalcoelotes xizangensis</i>	28.06	86.35	3383	KY791883	KY791584	KY791283	KY790981	KY778871	KY779128	KY790691	KY779409
SD060	<i>Coelotes antri</i>	36.09	138.82	683	KY792054	KY791755	KY791454	KY791152	KY779012	KY779299	KY790858	KY779567
SD066	<i>Tegeocoelotes corasides</i>	35.62	139.38	650	KY792062	KY791763	KY791462	KY791160	KY779020	KY779307	KY790865	KY779571
SD092	<i>Coelotes thailandensis</i>	18.53	98.5	1649	KY792072	KY791773	KY791472	KY791170	KX555507	KY779317	KY790874	KY779579
ZZ003	<i>Platocoelotes latus</i>	23.81	107.87	280	KY791984	KY791685	KY791384	KY791082	KY778956	KY779229	KY790791	KY779500
ZZ019	<i>Tonsilla lyrata</i>	28.15	106.84	1038	KY791993	–	KY791393	KY791091	KY778961	KY779238	KY790800	KY779508
ZZ032	<i>Tonsilla triculenta</i>	26.15	106.46	1370	KY791996	KY791697	KY791396	KY791094	KY778964	KY779241	KY790803	KY779511
ZZ042	<i>Platocoelotes kailiensis</i>	26.44	107.53	1022	KY791971	KY791672	KY791371	KY791069	KY778947	KY779216	KY790778	KY779488
ZZ084	<i>Notiocaelotes palinitropus</i>	18.73	109.86	1000	KY791809	KY791510	KY791209	KY790911	KY778799	KY779054	KY790627	KY779351
ZZ233	<i>Notiocaelotes pseudolingulatus</i>	18.73	109.86	939	KY791810	KY791511	KY791210	KY790912	KY778800	KY779055	KY790628	KY779352
ZZ405	<i>Inermocoelotes jurinitschi</i>	42.58	23.28	1350	KY792048	KY791749	KY791448	KY791146	KY779006	KY779293	KY790852	KY779562
ZZ419	<i>Lineacoelotes funiushanensis</i>	33.48	111.93	1487	KY791937	KY791638	KY791337	KY791035	KY778925	KY779182	KY790745	KY779458
ZZ423	<i>Wadotes hybridus</i>	44.47	-75.03	283	KY791838	KY791539	KY791238	–	KY778826	KY779083	–	–
ZZ560	<i>Iwogumoia insidiosa</i>	41.71	126.17	460	KY791840	KY791541	KY791240	KY790941	KY778828	KY779085	KY790651	KY779376
ZZ581	<i>Spiricoelotes chufengensis</i>	26.49	115.93	395	KY791987	KY791688	KY791387	KY791085	KT896541	KY779232	KY790794	KY779503
ZZ593	<i>Longicoelotes geei</i>	29.48	117.61	352	KY791944	KY791645	KY791344	KY791042	KY778932	KY779189	KY790752	KY779465
ZZ623	<i>Longicoelotes karschi</i>	27.99	114.37	162	KY791943	KY791644	KY791343	KY791041	KY778931	KY779188	KY790751	KY779464
ZZ681	<i>Spiricoelotes zonatus</i>	29.75	118.39	122	KY791992	KY791693	KY791392	KY791090	KY778960	KY779237	KY790799	KY779507
ZZ737	<i>Iwogumoia yushanensis</i>	22.65	120.26	285	KY791845	KY791546	KY791245	KY790946	KY778833	KY779090	KY790656	KY779377
ZZ741	<i>Coras juvenilis</i>	42.3	-71.71	193	KY791846	KY791547	KY791246	KY790947	KY778834	KY779091	KY790657	–
ZZ871	<i>Inermocoelotes falciger</i>	40.27	22.6	554	KY792051	KY791752	KY791451	KY791149	KY779009	KY779296	KY790855	KY779565
ZZ895	<i>Platocoelotes lichuanensis</i>	30.64	109.72	588	KY791966	KY791667	KY791366	KY791064	KY778942	KY779211	KY790773	KY779484
ZZ935	<i>Draconarius pseudocapitulatus</i>	27.79	98.51	3200	KY791923	KY791624	KY791323	KY791021	KY778911	KY779168	KY790731	KY779445
ZZ940	<i>Coelotes acicularis</i>	25.97	98.71	2600	KY792077	KY791778	KY791477	KY791175	KY779025	KY779322	KY790879	KY779583
ZZ948	<i>Draconarius paratrifasciatus</i>	24.83	98.77	2177	KY791902	KY791603	KY791302	KY791000	KY778890	KY779147	KY790710	KY779427
ZZ972	<i>Sinocoelotes pseudoterrestris</i>	24.95	102.64	2437	KY792067	KY791768	KY791467	KY791165	KX555518	KY779312	KY790870	KY779574
ZZ982	<i>Sinocoelotes pseudoyunnanensis</i>	25.97	98.68	3133	KY792070	KY791771	KY791470	KY791168	KX555519	KY779315	KY790872	KY779577
–	<i>Agelenopsis aperta</i>	–	–	–	FJ607444	FJ607478	FJ607517	FJ607552	FJ607591	–	FJ607629	
–	<i>Barronopsis barrowsi</i>	–	–	–	DQ628581	DQ628737,	DQ628664	DQ628609	DQ628636	–	–	
CL111	<i>Tegenaria hasperi</i>	44.44	26.28	–	KY791791	KY791492	KY791191	KY790893	KY778781	KY779036	KY790611	KY779335
CL113	<i>Tegenaria ferruginea</i>	45.2	23.78	–	KY791800	KY791501	KY791200	KY790902	KY778790	KY779045	KY790620	KY779344
CL121	<i>Histopona torpida</i>	46.11	25.9	–	KY791823	KY791610	KY791249	KY791185	KY779030	KY779092	KY790889	KY779593
CL127	<i>Tegenaria sp</i>	45.56	24.25	–	KY791798	KY791499	KY791198	KY790900	KY778788	KY779043	KY790618	KY779342
ZZ116	<i>Tegenaria domestica</i>	42.31	42.67	–	KY791789	KY791490	KY791189	KY790891	KY778779	KY779034	KY790609	KY779333
ZZ347	<i>Tegenaria lapicidinaria</i>	44.96	34.11	–	KY791792	KY791493	KY791192	KY790894	KY778782	KY779037	KY790612	KY779336
ZZ348	<i>Eratigena agrestis</i>	44.96	34.11	–	KY791801	KY791502	KY791201	KY790903	KY778791	KY779046	KY790621	–
ZZ770	<i>Tegenaria faniapollinis</i>	38.15	23.67	–	KY791790	KY791491	KY791190	KY790892	KY778780	KY779035	KY790610	KY779334
ZZ775	<i>Tegenaria parietina</i>	38.56	25.86	–	KY791794	KY791495	KY791194	KY790896	KY778784	KY779039	KY790614	KY779338
ZZ779	<i>Tegenaria dalmatica</i>	36.32	28.16	–	KY791788	KY791489	KY791188	KY790890	KY778778	KY779033	KY790608	KY779332
ZZ790	<i>Tegenaria domestica</i>	41.35	26.45	–	KY791799	KY791500	KY791199	KY790901	KY778789	KY779044	KY790619	KY779343
ZZ799	<i>Tegenaria schmalfussi</i>	35.31	25.58	–	KY791797	KY791498	KY791197	KY790899	KY778787	KY779042	KY790617	KY779341
ZZ821	<i>Tegenaria pagana</i>	35.59	24.15	–	KY791793	KY791494	KY791193	KY790895	KY778783	KY779038	KY790613	KY779337
ZZ824	<i>Tegenaria ariadnae</i>	35.12	26.15	–	KY791795	KY791496	KY791195	KY790897	KY778785	KY779040	KY790615	KY779339
ZZ854	<i>Tegenaria pieperi</i>	35.09	25.99	–	KY791796	KY791497	KY791196	KY790898	KY778786	KY779041	KY790616	KY779340
CL090	<i>Taira sp</i>	34.26	111.84	–	KY791804	KY791505	KY791204	KY790906	KY778794	KY779049	KY790624	KY779346

Table A2. Specimen locality data for NCBI sequenced transcriptomes.

Family	Species	Specimen ID	Family	Species	Specimen ID
Agelenidae	<i>Agelenopsis emertoni</i>	SRR1514895	Homalonychidae	<i>Homalonychus theologus</i>	SRR3144075
Agelenidae	<i>Agelenopsis pennsylvanica</i>	SRR1329248	Hypocephilidae	<i>Hypocephalus pococki</i>	SRR1514889
Agelenidae	<i>Pireneitega garibaldii</i>	SRR8512124	Idiopidae	<i>Idiops bersebaensis</i>	SRR1514907
Agelenidae	<i>Pireneitega pyrenaea</i>	SRR8512117	Leptonetidae	<i>Calileptoneta californica</i>	SRR3144085
Agelenidae	<i>Pireneitega segestiformis</i>	SRR8512116	Linyphiidae	<i>Frontinella communis</i>	SRR1514904
Agelenidae	<i>Pireneitega taishanensis</i>	SRR8512114	Liphistiidae	<i>Liphistius malayanus</i>	SRR1145736
Agelenidae	<i>Pireneitega spinivulva</i>	SRR8512115	Lycosidae	<i>Pardosa pseudoannulata</i>	SRR1833279
Amaurobiidae	<i>Amaurobius ferox</i>	SRR1329250	Lycosidae	<i>Schizocosa rovneri</i>	SRR1514894
Amaurobiidae	<i>Callobius</i> sp. NG-2016	SRR3144088	Mecicobothriidae	<i>Megahexura fulva</i>	SRR1514891
Amphinectidae	<i>Metaltella simoni</i>	SRR3144079	Mimetidae	<i>Ero leonina</i>	SRR1514886
Antrodiaetidae	<i>Aliatypus coylei</i>	SRR1514876	Mysmenidae	<i>Microdipoena guttata</i>	SRR1333842
Antrodiaetidae	<i>Antrodiaetus unicolor</i>	SRR1514897	Nemesiidae	<i>Brachythele longitarsis</i>	SRR1514875
Anyphaenidae	<i>Hibana</i> sp. NG-2016	SRR3144074	Nemesiidae	<i>Damarchus</i> sp. NG-2016	SRR3144092
Araneidae	<i>Argiope bruennichi</i>	ERR574428	Nemesiidae	<i>Pionothele</i> sp. NG-2014	SRR1514906
Araneidae	<i>Gasteracantha hasselti</i>	SRR1048659	Nephilidae	<i>Nephila clavipes</i>	SRR1514901
Araneidae	<i>Macracantha arcuata</i>	SRR1048826	Nesticidae	<i>Nesticus bishopi</i>	SRR1655191
Araneidae	<i>Micrathena gracilis</i>	SRR1514882	Nesticidae	<i>Nesticus cooperi</i>	SRR1514892
Araneidae	<i>Neoscona arabesca</i>	SRR1145741	Oecobiidae	<i>Oecobius cellariorum</i>	SRR1365089
Araneidae	<i>Verrucosa arenata</i>	SRR3144087	Oxyopidae	<i>Peucetia longipalpis</i>	SRR1514898
Atypidae	<i>Sphodros rufipes</i>	SRR1514908	Paratropidae	<i>Paratropis</i> sp.	SRR1514893
Baryelidae	<i>Trichopelma chlaselva</i>	SRR1514881	Pholcidae	<i>Pholcus manueli</i>	SRR1365208
Caponiidae	<i>Calponia harrisonfordi</i>	SRR3144089	Phrynididae	<i>Damon variegatus</i>	SRR1145694
Corinnidae	<i>Trachelas tranquillus</i>	SRR1329247	Pimoidae	<i>Pimoa</i> sp. NG-2016	SRR3144083
Ctenidae	<i>Anahita punctulata</i>	SRR3144072	Pisauridae	<i>Dolomedes triton</i>	SRR3144094
Ctenidae	<i>Cupiennius salei</i>	SRR880446	Pisauridae	<i>Pisaurina mira</i>	SRR1365651
Ctenizidae	<i>Cyclocosmia truncata</i>	SRR1514884	Salticidae	<i>Habronattus signatus</i>	SRR1514888
Ctenizidae	<i>Hebestatis theveneti</i>	SRR1514887	Salticidae	<i>Habronattus ustulatus</i>	SRR1656783
Deinopidae	<i>Deinopis longipes</i>	SRR1514879	Scytodidae	<i>Scytodes thoracica</i>	SRR1514872
Desidae	<i>Badumna longinqua</i>	SRR3144073	Segestriidae	<i>Segestria</i> sp. NG-2016	SRR3144084
Dictynidae	<i>Cicurina travisae</i>	SRR1654705	Sicariidae	<i>Loxosceles deserta</i>	SRR3144077
Dictynidae	<i>Cicurina vibora</i>	SRR1514883	Sicariidae	<i>Loxosceles reclusa</i>	SRR1824532
Diguetidae	<i>Diguetia</i> sp. NG-2016	SRR3144093	Tetragnathidae	<i>Leucauge venusta</i>	SRR1145740
Dipluridae	<i>Microhexura montivaga</i>	SRR1986525	Tetragnathidae	<i>Tetragnatha perreirai</i>	SRR1427111
Dysderidae	<i>Dysdera crocata</i>	SRR1328258	Theraphosidae	<i>Acanthoscurria geniculata</i>	GAZS00000000
Dysderidae	<i>Dysdera crocata</i>	SRR3144095	Theraphosidae	<i>Aphonopelma iviei</i>	SRR1514871
Eresidae	<i>Stegodyphus mimosarum</i>	GAZR00000000	Theraphosidae	<i>Haplopelma hainanum</i>	SRR2155564
Euctenizidae	<i>Aptostichus atomarius</i>	SRR1514885	Theridiidae	<i>Latrodectus hesperus</i>	SRR1853324
Euctenizidae	<i>Aptostichus stephencolberti</i>	SRR1514874	Theridiidae	<i>Parasteatoda tepidariorum</i>	SRR1824487
Euctenizidae	<i>Promyrmekiaphila clathrata</i>	SRR1514896	Theridiidae	<i>Theridion</i> sp. NG-2014	SRR1514902
Filistatidae	<i>Kukulcania hibernalis</i>	SRR1514878	Thomisidae	<i>Misumenoides formosipes</i>	SRR3144080
Gnaphosidae	<i>Sergiolus capulatus</i>	SRR1514903	Uloboridae	<i>Uloborus glomosus</i>	SRR1328334
Hahniidae	<i>Calymmaria persica</i>	SRR3144091	Uloboridae	<i>Philoponella herediae</i>	SRR1514880

Table A3. Constraints on taxonomic calibration points for the 84-taxon dataset. Minimum and maximum ages for each calibration point used for estimating divergence dates in MCMCTREE. Node IDs correspond to figure S3.

Clade (node ID)	Node to be calibrated	Minimum	Maximum
1	Opisthothelae	299	315
2	Mygalomorphae	242	299
3	Atypoidina	113	125
4	Araneomorphae	228	299
5	Haplogynae (excluding the Filistatidae)	170	200
6	Orbiculariae	176	235
7	Dysderoidea	125	135

Notes: The time units of all parameters are in millions of years.

Table A4. The details and assignments of the three recalibration points and one used in the BEAST analyses for the 248-taxon dataset.

	Nodes		Distribution	Mean	Stdev	Offset
1	Agelenidae	crown	Normal	78.0	7.0	
2	Coelotinae	crown	Normal	54.0	6.0	
3	<i>Tegenaria</i>	stem	logNormal	2.4	0.9	35.0
4	Split of European clade and East Asian clade	crown	Normal	10.5	1.2	

Notes: The time units of all parameters are in millions of years.

Table A5. Geographical areas used in historical biogeographical analyses.

Area Code	Description	Circumscription and Geography	Climatic types	Precipitation
A	South Europe	The west end of the Alpine-Himalayan orogenic belt, the north coast of the Mediterranean Sea. There are more mountains, islands and peninsulas, such as the Pyrenees, Alps and Apennines.	Mediterranean	Humid to sub-humid
B	Caucasus and Anatolian Plateau	The eastern edge of the Mediterranean Sea surrounded by the Caspian Sea and the Black Sea with the semi-desert, steppes, arid woodlands environment.	Temperate continental	Sub-humid to semi-arid
C	The Pamir Plateau and Northern Tibet	Located at the south of the Alai Valley, including the highest plateaus in the world. The plateau is characterized by several mountain ranges and glaciers with dry climates and arid ecosystems. The Tibetan and Pamir Plateaus extend for more than 2000 km from east to west, with an average height of 4000–5000 m.	Plateau	Arid to semi-arid
D	Mountains of Central Asia	South to the Alai Valley, including the Tian Mountains in the south, the Altai Mountains in the north and deserts in Tarim and Junggar Basins.	Temperate continental and plateau	Arid to semi-arid
E	Mountains of Southwest China	Also known as the Hengduan Mountains, the mountains of the Tibetan Plateau which run west to east are compressed and run north to south, forming the south-eastern edge of the plateau. There are many peaks higher than 5,000 meters and glaciers. The three great rivers of China and Southeast Asia run in deep parallel valleys separated by mountain ranges.	Vertical distribution of subtropical to subfrigid	Humid to sub-humid
F	South China and surrounding areas	The area roughly between the Qin Mountains, Huai River and the Red River (Vietnam). There are various terrains, such as the Yunnan–Guizhou Plateau, hilliness, lowland and low-latitude islands, and good vegetation cover caused by the southeast monsoon.	Subtropical monsoon	Humid
G	North China and surrounding areas	Located in the mid-high latitudes of northeastern Asia south to the Qin Mountains and Huai River, composed of plains, lowlands, sporadic mountains and islands near the mainland.	Temperate monsoon	Sub-humid

Table A6. Dispersal probabilities between areas under two time slices from the BioGeoBEARS analyses.

Table A7. Dispersal limitations between areas under two time slices from the BioGeoBEARS analyses.

Areas	Slice 1: 1–16 Ma							Slice 2: 17–33 Ma						
	A	B	C	D	E	F	G	A	B	C	D	E	F	G
A	1	1	0	0	0	0	0	1	1	0	0	0	0	0
B	1	1	1	1	0	0	0	1	1	1	0	0	0	0
C	0	1	1	1	1	0	1	0	1	1	1	1	0	1
D	0	1	1	1	0	0	1	0	0	1	1	0	0	1
E	0	0	1	0	1	1	1	0	0	1	0	1	1	1
F	0	0	0	0	1	1	1	0	0	0	0	1	1	1
G	0	0	1	1	1	1	1	0	0	1	1	1	1	1

Table A8. Unduplicated occurrence records of Pireneitega species from the literature.

Taxon	Latitude	Longitude	Altitude (m)	References
<i>P. armeniaca</i>	40.62	39.38	1500~2100	Brignoli, P. M. (1978g)
	40.52	40.25	2400	
	41.08	42.21	2500	
	41.35	42.34	2450	
<i>P. cottarellii</i>	41.63	34.89		Brignoli, P. M. (1978g).
<i>P. pyrenaea</i>	42.60	0.41		Simon, E. (1870b)
	42.71	2.83		Blauwe, R. de (1973a)
	42.51	2.12		Wang, X. P. (2002)
<i>P. fedotovi</i>	41.29	69.24		Charitonov, D. E. (1946); Brignoli, P. M. (1982b)
<i>P. major</i>	39.54	68.55		Kroneberg, A. (1875)
	39.56	68.59		
	39.58	69.08		Zhang, X. Q. & Marusik, Y. M. (2016)
<i>P. garibaldii</i>	38.17	15.83		Blauwe, R. de (1973a)
	38.31	16.11		
	38.21	15.86		
	41.78	13.86		Brignoli, P. M. (1977f)
	39.03	16.33		
	41.82	15.99		
	37.92	14.65		
	40.14	15.84		Groppali R. & Pesarini C., 2005a
	41.75	16.03		IJland, S., Helsdingen, P. J. van & Miller, J. (2012)
	38.17	15.92		Kovblyuk, M. M., Kastrygina, Z. A., Marusik, Y. M. & Ponomarev, A. V. (2013a)
<i>P. taiwanensis</i>	23.49	120.89	2100~2480	Wang, X. P. & Ono, H. (1998)
	23.98	121.60	240~300	
	24.30	121.04	2440	
	24.02	121.19		
	23.99	121.26	2360	
<i>P. ovtchinnikovi</i>	43.88	40.20		
	44.35	40.19		Kovblyuk, M. M., Kastrygina, Z. A., Marusik, Y. M. & Ponomarev, A. V. (2013a)
	44.23	40.19		Otto, S. (2014)
	43.84	40.21		
	43.92	40.15		
	44.54	40.11		
	44.21	39.96		
	43.34	42.46		
	43.51	40.65		
	43.22	41.15		
	43.17	41.05		
	43.22	41.12		
	43.31	40.33		
	42.34	43.03		
	43.51	40.65		Mcheidze, T. (1997).
	43.05	42.73		
	42.69	43.78		
	42.80	44.01		Ponomarev, A. V. & Komarov, Y.E. (2013)
	42.86	44.15		
	42.80	43.95		
	42.75	44.28		
	42.83	44.30		
	43.44	41.74		Martinovchenko & Mikhailov (2014)
	43.44	41.78		
<i>P. spasskyi</i>	43.9	40.15	1000~1800	Ponomarev & Chumachenko (2014)
	41.81	46.31		Charitonov, D. E. (1946)
	41.19	47.18		Dunin, P. M. (1989b)
	40.63	48.64		Kovblyuk, M. M., Kastrygina, Z. A., Marusik, Y. M. & Ponomarev, A. V. (2013a)
	40.79	48.16		
	40.95	47.94		
	41.39	48.13		
	41.76	46.62		

	41.60	47.33	
	42.07	46.89	
	42.18	46.36	
	42.39	46.07	
	42.86	46.43	
	42.92	46.50	
	42.48	45.11	
	41.00	43.00	Mcheidze, T. (1964)
	41.62	42.32	
	41.64	42.98	
	41.64	42.32	
	41.68	42.71	
	41.69	43.52	
	41.70	42.98	
	41.71	42.85	
	41.75	43.53	
	41.89	43.34	
	41.90	41.92	
	42.16	42.90	
	42.29	45.23	
	42.34	42.98	
	42.38	43.03	
	42.41	43.22	
	42.45	45.58	
	42.45	43.15	
	42.47	43.15	
	42.52	43.15	
	42.58	43.45	
	42.66	44.65	
	42.66	44.63	
	42.69	43.78	
	42.72	44.55	
	43.50	42.00	
	42.01	43.20	Mcheidze, T. (1960)
	41.68	41.87	Mcheidze, T. (1997).
	41.85	42.33	
	42.73	46.12	Minoranski, V. A., Ponomarev, A. V., Slusajev, V. V., &
	42.97	45.02	Gramotenko, V. P. (1984)
	41.70	44.80	Pkhakadze, V. (2006)
<i>P. birulai</i>	56.50	84.99	Ermolajev, W. N. (1927)
	54.17	85.38	Azarkina, G. N. & Trilikauskas, L. A. (2012)
	51.18	83.70	600
	50.93	84.25	1200
	51.92	87.10	
	51.78	87.27	
	51.50	87.28	
<i>P. segestriiformis</i>	42.60	0.41	Dufour, L. (1820d)
	42.51	1.52	Blauwe, R. de (1973a)
	43.07	0.15	
	43.33	-1.37	Brignoli, P. M. (1978e)
	43.42	-0.86	
	43.07	-1.19	
	42.98	-0.75	1650
	42.82	-0.48	
	42.73	-0.01	
	42.80	0.13	2300~2500

Table A9. A conservative estimation of species richness for each clade in diversity-rates analyses.

Clades	sampled	unsampled	estimated undiscovered	sampling rate
Europe	5	2	1	62.50%
Central Asia	16	2	3	76.19%
East Asia	10	2	2	71.43%
Total	31	6	6	72.09%

Table A10. The major clade divergence times estimated with different approaches based on the 248-taxa dataset.

Nodes	Birth-Death		Yule	
	Mean	95% HPD	Mean	95% HPD
<i>Pireneitega</i>	30.51	26.44–34.79	30.96	26.81–35.2
Europe clade split with East Asia clade	29.84	25.76–33.92	30.28	26.22–34.39
Caucasia clade split with East Asia clade	28.52	24.51–32.48	28.94	24.96–32.96
Central Asia clade	24.6	21.03–28.29	24.99	21.41–28.67
Europe clade	16.84	13.82–19.94	17.17	14.1–20.23
Caucasia clade	13.11	9.53–16.6	13.45	10.0–17.18
East Asia clade	27.55	23.8–31.54	27.99	24.31–32.09

Notes: The time units of all parameters were set in millions of years. HPD: highest posterior density.

Table A11. Results from the TreePar analyses conducted on the BEAST chronogram.

	BD	Pm	-log lik	t1	r1	t2	r2	t3	r3	st1	st2	P
All	constant	2	112.67	0.00	0.06							-
	1 shift	5	101.69	0.02	0.00	0.00	0.09			5.20		0.000
	2 shifts	8	99.51	0.01	0.00	0.05	0.00	0.06	0.14	5.20	13.10	0.225
East Asia	constant	2	33.63	0.00	0.04							-
	1 shift	5	26.37	0.01	0.92	0.01	0.02			15.10		0.004
	2 shifts	8	25.09	0.60	1.00	0.91	0.00	0.00	0.03	10.50	15.10	0.464
Central Asia	constant	2	52.04	0.00	0.07							-
	1 shift	5	45.11	0.00	0.04	0.00	0.11			5.20		0.003
	2 shifts	8	43.49	0.01	0.01	1.55	0.00	0.11	-0.56	5.20	21.70	0.355
Europe	constant	2	13.60	0.00	0.03							-
	1 shift	5	8.54	0.96	1.09	0.00	-0.06			13.00		0.007
	2 shifts	8	5.16	0.93	1.01	1.31	0.00	-0.04	-0.04	13.00	13.20	0.080

Notes: BD: birth-death model; Pm, number of parameters in the model; - log lik, the log-likelihood of the model; P, P-value of the likelihood ratio test between incrementally more complex models (the model is supported if P<0.05); r: diversification rate after switch; t: turnover rate; st: most recent shift time.

Table A12. Results of niche overlap between pairs of *Pireneitega* species measured by relative ranks metrics (RR): values near 1.0 are considered identical or highly interchangeable.

	1	3	2	5	6	7	25	21	15	24	19	8	9	18	36	30	31	28	29	26	32	33
1. <i>P. segestiformis</i>	1	0.8603	0.8482	0.7027	0.5889	0.5103	0.2787	0.5831	0.297	0.2552	0.4519	0.7027	0.5439	0.3535	0.4975	0.5831	0.5554	0.4799	0.5676	0.5925	0.8044	0.866
3. <i>P. garibaldii</i>	0.8603	1	0.809	0.7019	0.5863	0.5501	0.3354	0.5776	0.3356	0.2992	0.4916	0.7403	0.5804	0.394	0.5495	0.5734	0.6018	0.4817	0.5584	0.5587	0.8453	0.8
2. <i>P. pyrenaea</i>	0.8482	0.809	1	0.7621	0.6393	0.4761	0.3446	0.618	0.3018	0.3549	0.5347	0.7455	0.6409	0.3447	0.5482	0.5444	0.5384	0.4022	0.5166	0.5026	0.7248	0.7789
5. <i>P. armeniaca</i>	0.7027	0.7019	0.7621	1	0.7156	0.5932	0.5195	0.7698	0.3766	0.5256	0.613	0.791	0.6712	0.4613	0.5843	0.6094	0.6454	0.4192	0.4625	0.4622	0.6573	0.6746
6. <i>P. ovetchinnikovi</i>	0.5889	0.5863	0.6393	0.7156	1	0.6466	0.608	0.6979	0.3056	0.5528	0.5176	0.6021	0.6074	0.4912	0.6222	0.6327	0.5875	0.5175	0.5288	0.4872	0.5865	0.526
7. <i>P. spasskyi</i>	0.5103	0.5501	0.4761	0.5932	0.6466	1	0.6404	0.6339	0.4995	0.5598	0.5212	0.5375	0.454	0.6277	0.6085	0.5996	0.6563	0.566	0.519	0.5174	0.6345	0.5025
25. <i>P. birulai</i>	0.2787	0.3354	0.3446	0.5195	0.608	0.6404	1	0.6108	0.58	0.8245	0.595	0.442	0.4976	0.664	0.6196	0.5269	0.5688	0.4802	0.4442	0.3609	0.3751	0.2494
21. <i>P. huochengensis</i>	0.5831	0.5776	0.618	0.7698	0.6979	0.6339	0.6108	1	0.4742	0.5869	0.6588	0.6507	0.5617	0.601	0.5736	0.7016	0.7049	0.4769	0.5575	0.5086	0.5928	0.5484
15. <i>P. lini</i>	0.297	0.3356	0.3018	0.3766	0.3056	0.4995	0.58	0.4742	1	0.6219	0.6771	0.4397	0.4666	0.6946	0.4334	0.4471	0.5599	0.4652	0.4429	0.4325	0.3759	0.3354
24. <i>P. burginensis</i>	0.2552	0.2992	0.3549	0.5256	0.5528	0.5598	0.8245	0.5869	0.6219	1	0.6643	0.4796	0.591	0.6016	0.558	0.4545	0.5343	0.4094	0.3421	0.296	0.3014	0.234
19. <i>P. tianchiensis</i>	0.4519	0.4916	0.5347	0.613	0.5176	0.5212	0.595	0.6588	0.6771	0.6643	1	0.6443	0.7104	0.6047	0.5613	0.4846	0.6669	0.3269	0.4229	0.2971	0.4884	0.4034
8. <i>P. major</i>	0.7027	0.7403	0.7455	0.791	0.6021	0.5375	0.442	0.6507	0.4397	0.4796	0.6443	1	0.7228	0.42	0.5545	0.5194	0.6407	0.3724	0.3871	0.4123	0.6786	0.6869
9. <i>P. zonsteini</i>	0.5439	0.5804	0.6409	0.6712	0.6074	0.454	0.4976	0.5617	0.4666	0.591	0.7104	0.7228	1	0.438	0.5915	0.4444	0.5793	0.3294	0.3683	0.2821	0.5293	0.4909
18. <i>P. liui</i>	0.3535	0.394	0.3447	0.4613	0.4912	0.6277	0.664	0.601	0.6946	0.6016	0.6047	0.42	0.438	1	0.5337	0.6771	0.6589	0.6424	0.5967	0.5465	0.4364	0.3717
36. <i>P. spinivulva</i>	0.4975	0.5495	0.5482	0.5843	0.6222	0.6085	0.6196	0.5736	0.4334	0.558	0.5613	0.5545	0.5915	0.5337	1	0.5143	0.5998	0.4205	0.5109	0.3742	0.5623	0.4462
30. <i>P. xinping</i>	0.5831	0.5734	0.5444	0.6094	0.6327	0.5996	0.5269	0.7016	0.4471	0.4545	0.4846	0.5194	0.4444	0.6771	0.5143	1	0.6922	0.7013	0.7258	0.6821	0.6006	0.5853
31. <i>P. triglochinata</i>	0.5554	0.6018	0.5384	0.6454	0.5875	0.6563	0.5688	0.7049	0.5599	0.5343	0.6669	0.6407	0.5793	0.6589	0.5998	0.6922	1	0.5366	0.5524	0.4939	0.6417	0.5133
28. <i>P. involuta</i>	0.4799	0.4817	0.4022	0.4192	0.5175	0.566	0.4802	0.4769	0.4652	0.4094	0.3269	0.3724	0.3294	0.6424	0.4205	0.7013	0.5366	1	0.6478	0.8114	0.4857	0.5414
29. <i>P. xiyanhouensis</i>	0.5676	0.5584	0.5166	0.4625	0.5288	0.519	0.4442	0.5575	0.4429	0.3421	0.4229	0.3871	0.3683	0.5967	0.5109	0.7258	0.5524	0.6478	1	0.6754	0.6124	0.5721
26. <i>P. lushuiensis</i>	0.5925	0.5587	0.5026	0.4622	0.4872	0.5174	0.3609	0.5086	0.4325	0.296	0.2971	0.4123	0.2821	0.5465	0.3742	0.6821	0.4939	0.8114	0.6754	1	0.5521	0.668
32. <i>P. luctuosa</i>	0.8044	0.8453	0.7248	0.6573	0.5865	0.6345	0.3751	0.5928	0.3759	0.3014	0.4884	0.6786	0.5293	0.4364	0.5623	0.6006	0.6417	0.4857	0.6124	0.5521	1	0.7474
33. <i>P. taiwanensis</i>	0.866	0.8	0.7789	0.6746	0.526	0.5025	0.2494	0.5484	0.3354	0.234	0.4034	0.6869	0.4909	0.3717	0.4462	0.5853	0.5133	0.5414	0.5721	0.668	0.7474	1

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