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Supplement of

Detecting climatically driven phylogenetic and morphological divergence among spruce (*Picea*) species worldwide

Guo-Hong Wang et al.

Correspondence to: Guo-Hong Wang (ghwangaq@ibcas.ac.cn)

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Table S1 Index of divergence (D) from the phylogeny-based SEEVA evaluation of spruce species worldwide using elevation, four temperature variables (AMT: annual mean temperature; MTWM: max temperature of warmest month; MTCM: min temperature of coldest month; and TAR: temperature annual range) and four precipitation variables (AP: annual precipitation; PWM: precipitation of wettest month; PDM: precipitation of driest month; and PCQ: precipitation of coldest quarter).

Phylogeny Node	Number of Samples		Index of Divergence (D)								
			Temperature Variables				Precipitation Variables				
	N_a	N_b	Elevation	AMT	MTWM	MTCM	TAR	AP	PWM	PDM	PCQ
1	1568	1820	0.25*	0.02*	0.15*	0.08*	0.26*	0.09*	0.16*	0.20*	0.05*
2	1502	66	0.30*	0.38*	0.33*	0.17*	0.38*	0.20*	0.03	0.13*	0.23*
3	1497	5	0.69*	0.45	0.49	0.35	0.55	0.67*	0.72*	0.19	0.29
4	1438	59	0.64*	0.12*	0.32*	0.27*	0.68*	0.31*	0.77*	0.26*	0.06
5	1435	3	0.74	0.66	0.47	0.44	0.89*	0.69	0.78	0.24	0.51
6	1293	142	0.32*	0.56*	0.11*	0.79*	0.83*	0.76*	0.75*	0.62*	0.46*
7	256	1037	0.56*	0.12*	0.45*	0.77*	0.87*	0.45*	0.34*	0.99*	1.00*
8	200	56	0.68*	0.12*	0.04	0.03	0.07	0.24*	0.41*	0.01	0.00
9	49	62	0.58*	0.47*	0.52*	0.56*	0.74*	0.72*	0.57*	0.02*	0.00
10	51	8	0.86*	0.41	0.20	0.33	0.31	0.02	0.02	0.30	0.32
11	35	31	0.14	0.02	0.27	0.17	0.04	0.22	0.15	0.59*	0.26*
12	29	6	0.18	0.48	0.07	0.66*	0.56	0.55	0.71*	0.00	0.05
13	6	23	0.52	0.34	0.08	0.80*	1.00*	0.80*	1.00*	0.81*	0.08
14	1100	720	0.46*	0.19*	0.13*	0.30*	0.31*	0.05*	0.42*	0.54*	0.66*
15	1089	11	0.33	0.75*	0.37*	0.88*	0.93*	0.47*	0.60*	0.34	0.39*
16	700	389	0.22*	0.08*	0.07*	0.03*	0.02*	0.27*	0.27*	0.44*	0.05*
17	628	72	0.63*	0.24*	0.13*	0.33*	0.22*	0.12*	0.07*	0.04*	0.13*
18	590	38	0.38*	0.51*	0.08*	0.70*	0.88*	0.76*	0.79*	0.35*	0.64*
19	335	255	0.65*	0.22*	0.04	0.57*	0.47*	0.24*	0.09*	0.13*	0.30*
20	373	16	0.97*	0.72*	0.10	0.99*	0.70*	0.42*	0.86*	0.58*	0.25
21	174	199	0.08*	0.65*	0.30*	0.56*	0.35*	0.62*	0.52*	0.62*	0.58*
22	582	138	0.82*	0.41*	0.26*	0.40*	0.33*	0.54*	0.24*	0.81*	0.82*
23	489	93	0.02	0.42*	0.37*	0.66*	0.73*	0.87*	0.38*	1.00*	0.99*
24	285	204	0.01	0.52*	0.06*	0.67*	0.73*	0.56*	0.64*	0.01	0.01
25	260	25	0.02	0.04	0.53*	0.03	0.26*	0.42*	0.42*	0.14*	0.63*
26	248	12	0.45*	0.16	0.82*	0.20	0.17	0.03	0.00	0.25*	0.28*
27	165	83	0.05*	0.15*	0.18*	0.17*	0.06	0.16*	0.00	0.03*	0.01
28	161	4	0.00	0.34	0.53	0.65	0.67	0.95*	0.17	0.99*	0.99*
29	11	72	0.07	0.00	0.13	0.14	0.12	0.10	0.09	0.06	0.01
30	78	126	0.01	0.26*	0.17*	0.46*	0.81*	0.50*	0.99*	0.01	0.00
31	33	45	0.24*	0.30*	0.40*	0.15	0.14	0.13	0.07	0.04	0.01

Nodes correspond to those in Fig. 2. The number of samples for the two sister groups are indicated by N_a and N_b . *

Indicates a significant difference between sister groups at $P < 0.0016$ after Bonferroni correction.

Table S2 Index of divergence (D) from the morphology-based SEEVA evaluation of spruces worldwide using elevation, four temperature variables (AMT: annual mean temperature; MTWM: max temperature of warmest month; MTCM: min temperature of coldest month; and TAR: temperature annual range) and four precipitation variables (AP: annual precipitation; PWM: precipitation of wettest month; PDM: precipitation of driest month; and PCQ: precipitation of coldest quarter).

Morphology Node	Number of Samples		Index of Divergence (D)								
	N_a	N_b	Elevation	Temperature Variables				Precipitation Variables			
				AMT	MTWM	MTCM	TAR	AP	PWM	PDM	PCQ
1	2857	531	0.30*	0.17*	0.05*	0.18*	0.18*	0.16*	0.54*	0.32*	0.36*
2	2530	327	0.51*	0.06*	0.13*	0.25*	0.48*	0.11*	0.12*	0.35*	0.10*
3	2118	412	0.08*	0.10*	0.30*	0.22*	0.36*	0.14*	0.10*	0.25*	0.12*
4	42	2076	0.48*	0.42*	0.48*	0.22*	0.41*	0.01	0.26*	0.25*	0.04
5	25	17	0.46*	0.04	0.05	0.20	0.28	0.56*	0.47*	0.10	0.08
6	5	12	0.28	0.39	0.39	0.44	0.02	0.76	0.14	1.00*	1.00*
7	335	1741	0.14*	0.20*	0.13*	0.37*	0.54*	0.22*	0.26*	0.41*	0.31*
8	378	1363	0.21*	0.17*	0.10*	0.46*	0.49*	0.22*	0.46*	0.32*	0.30*
9	96	282	0.42*	0.94*	0.57*	0.98*	1.00*	0.97*	0.53*	0.98*	0.98*
10	93	3	0.71	1.00*	0.73	1.00*	1.00*	0.00	0.00	0.05	0.90
11	45	237	0.43*	0.72*	0.10	0.71*	0.65*	0.16*	0.52*	0.04	0.05
12	6	231	0.41	0.73*	0.13	1.00*	0.99*	1.00*	0.59	0.98*	0.99*
13	89	142	0.38*	0.14*	0.51*	0.00	0.00	0.71*	0.97*	0.08*	0.25*
14	1043	320	0.93*	0.08*	0.37*	0.69*	0.81*	0.74*	0.44*	0.98*	0.95*
15	6	1037	0.66*	0.31	0.47	0.29	0.85*	0.59	0.86*	0.25	0.26
16	244	76	0.04	0.76*	0.08	0.84*	0.83*	0.91*	0.83*	0.16*	0.13*
17	56	188	0.65*	0.18*	0.28*	0.04	0.00	0.05*	0.91*	0.00	0.00
18	126	62	0.03	0.02	0.17*	0.14*	0.70*	0.01	0.29*	0.00	0.00
19	27	49	0.07	0.31*	0.63*	0.66*	0.40*	0.01	0.05	0.72*	0.93*
20	11	16	0.43	0.00	0.08	0.00	0.55*	0.45	0.16	0.08	0.14
21	39	373	0.35*	0.17*	0.01	0.46*	0.39*	0.34*	0.13	0.49*	0.06
22	31	8	0.78*	0.40	0.09	0.77*	0.46	0.41	0.77*	0.32	0.35
23	199	174	0.08*	0.65*	0.30*	0.56*	0.35*	0.62*	0.52*	0.62*	0.58*
24	72	255	0.28*	0.09	0.06	0.11*	0.07*	0.18*	0.13*	0.00	0.33*
25	283	248	0.35*	0.26*	0.25*	0.46*	0.21*	0.28*	0.02*	0.43*	0.36*
26	89	194	0.98*	0.06	0.21*	0.12*	0.32*	0.65*	0.21*	0.78*	0.70*
27	38	51	0.93*	0.60*	0.14	0.82*	0.95*	0.16	0.01	0.42*	0.50*
28	33	161	0.00	0.31*	0.03	0.33*	0.43*	0.09	0.33*	0.00	0.00
29	11	237	0.66*	0.09	0.32	0.30	0.04	0.07	0.02	0.62*	0.60*
30	23	214	0.41*	0.21	0.13	0.01	0.26*	0.47*	0.93*	1.00*	0.70*
31	72	142	0.70*	0.26*	0.11*	0.15*	0.13*	0.45*	0.13*	0.66*	1.00*
32	138	4	1.00*	0.59	0.61	0.01	0.60	0.02	0.00	0.01	1.00

Nodes correspond to those in Figure 3. The number of samples for the two sister groups are indicated by N_a and N_b .

* Indicates a significant difference between sister groups at $P < 0.0016$ after Bonferroni correction.