

## **New Phytologist Supporting Information**

Article title: **Whole Genome Analyses Disentangle Reticulate Evolution of Primroses in a Biodiversity Hotspot**

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The following Supporting Information is available for this article:

**Fig. S1** Multispecies coalescent phylogeny of *Primula* sect. *Primula* made in ASTRAL-III.

**Fig. S2** gCF and sCF for all phylogenies.

**Fig. S3** Chloroplast phylogeny of *Primula* sect. *Primula*.

**Fig. S4** S-locus phylogeny of *Primula* sect. *Primula*.

**Fig. S5** Fbranch (*f*b) analysis in Dsuite with multispecies coalescent topology.

**Fig. S6** Ancestral range estimation under a Bayesian framework with phylogram.

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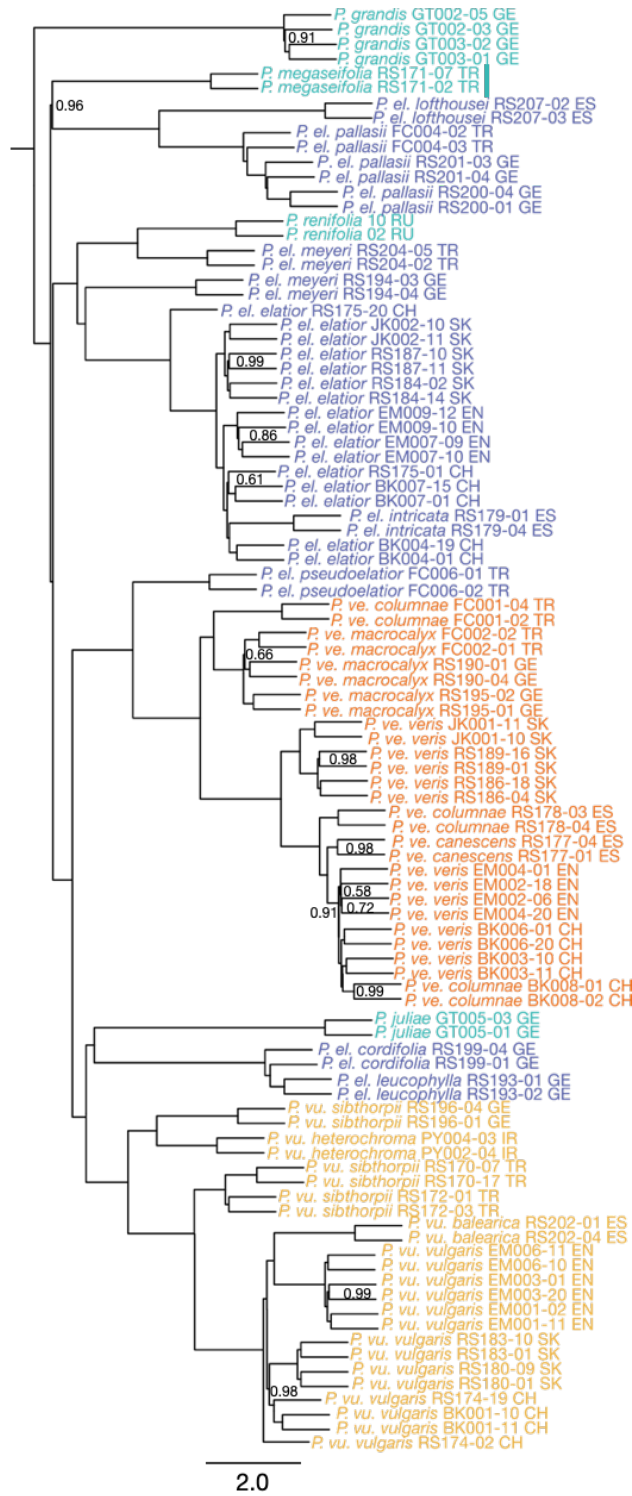
**Table S5** Posterior probabilities for every state in ancestral state estimation with phylogram.

**Methods S1** Geographic Sampling.

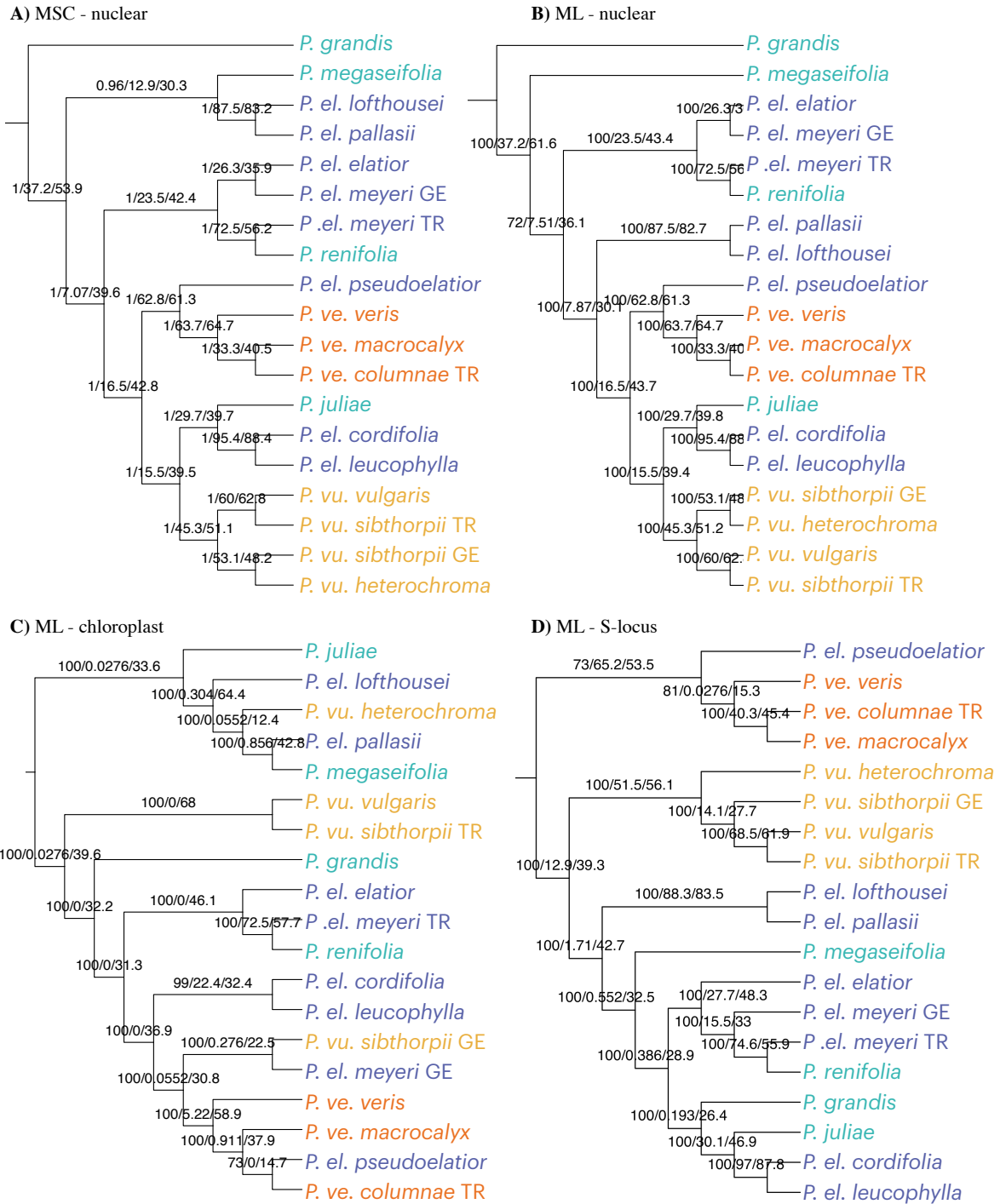
**Methods S2** Species networks estimation with NANUQ.

**Methods S3** Supplementary D-statistic analyses.

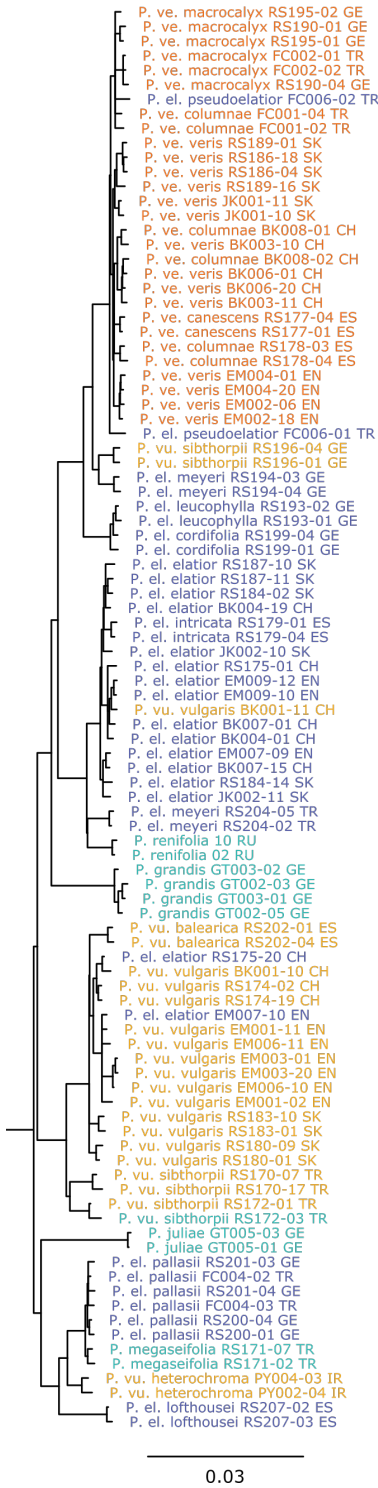
**Methods S4** Ancestral Range Estimation.



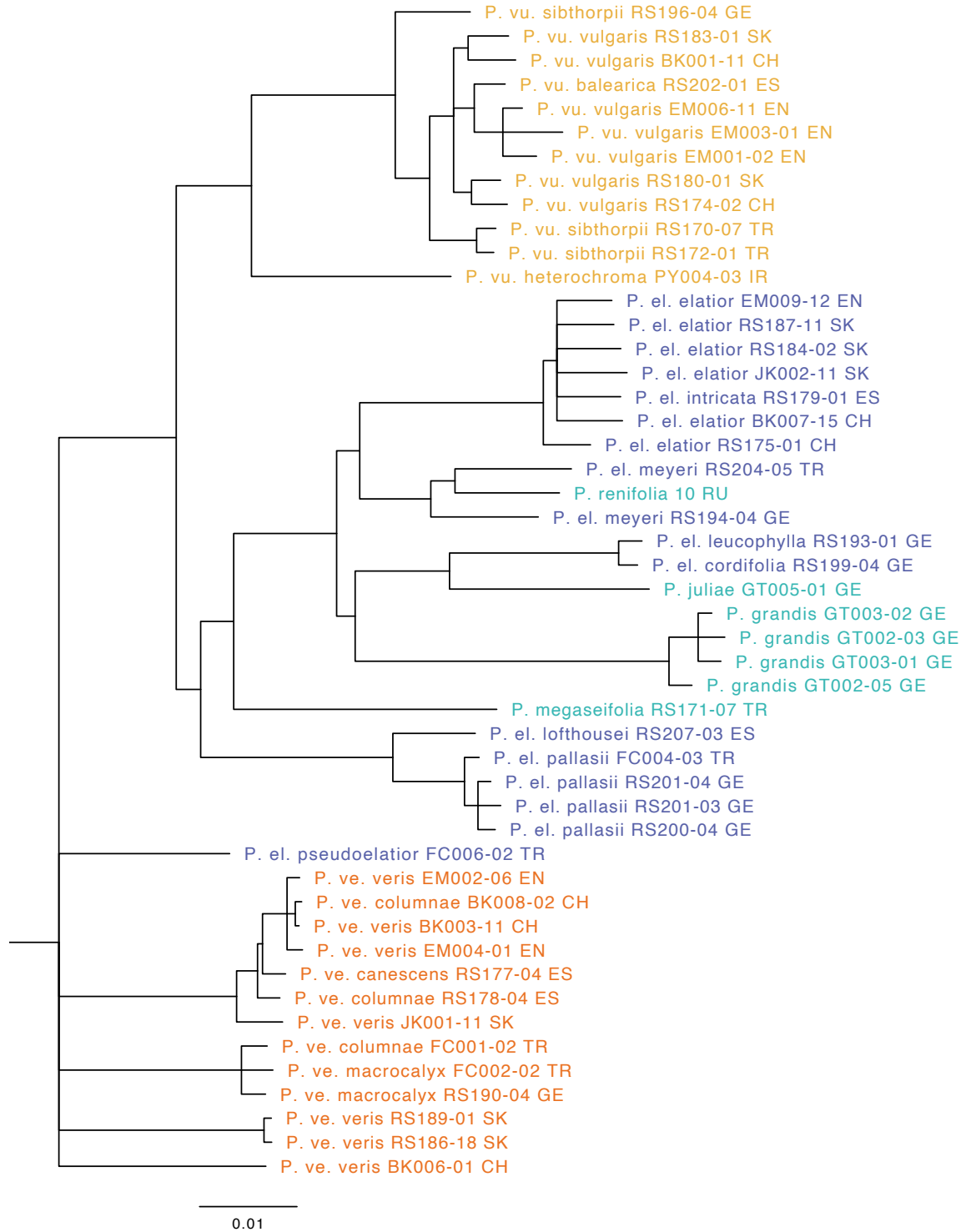
**Fig. S1** Multispecies coalescent phylogeny of *Primula* sect. *Primula* made in ASTRAL-III. Branches with <1.0 local posterior probability (PP) are labeled. Branch lengths are presented in coalescent units. Outgroups not shown. Abbreviations: *P. ve.* = *P. veris*, *P. vu.* = *P. vulgaris*, *P. el.* = *P. elatior*, EN = England, CH = Switzerland, SK = Slovakia, GE = Georgia, TR = Turkey, ES = Spain, IR = Iran, RU = Russia.



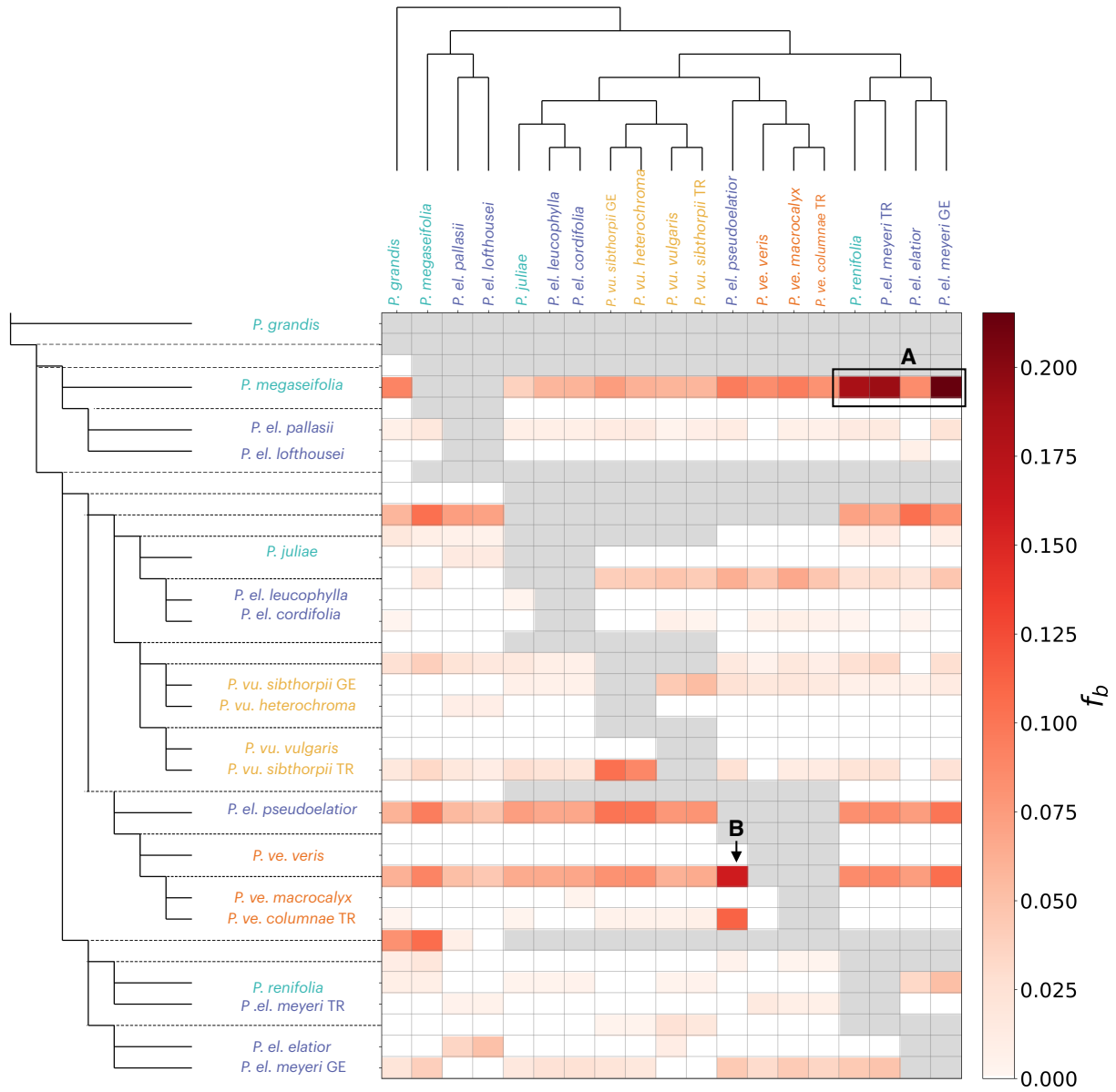
**Fig. S2** Gene and site concordance factors (gCF and sCF, respectively) for different genomic compartments. Branch labels are as follows (from left to right): branch support, gCF, sCF. Branch support is local posterior probability in A and bootstrap support in B, C, and D. MSC = Multispecies Coalescent, ML= Maximum Likelihood.



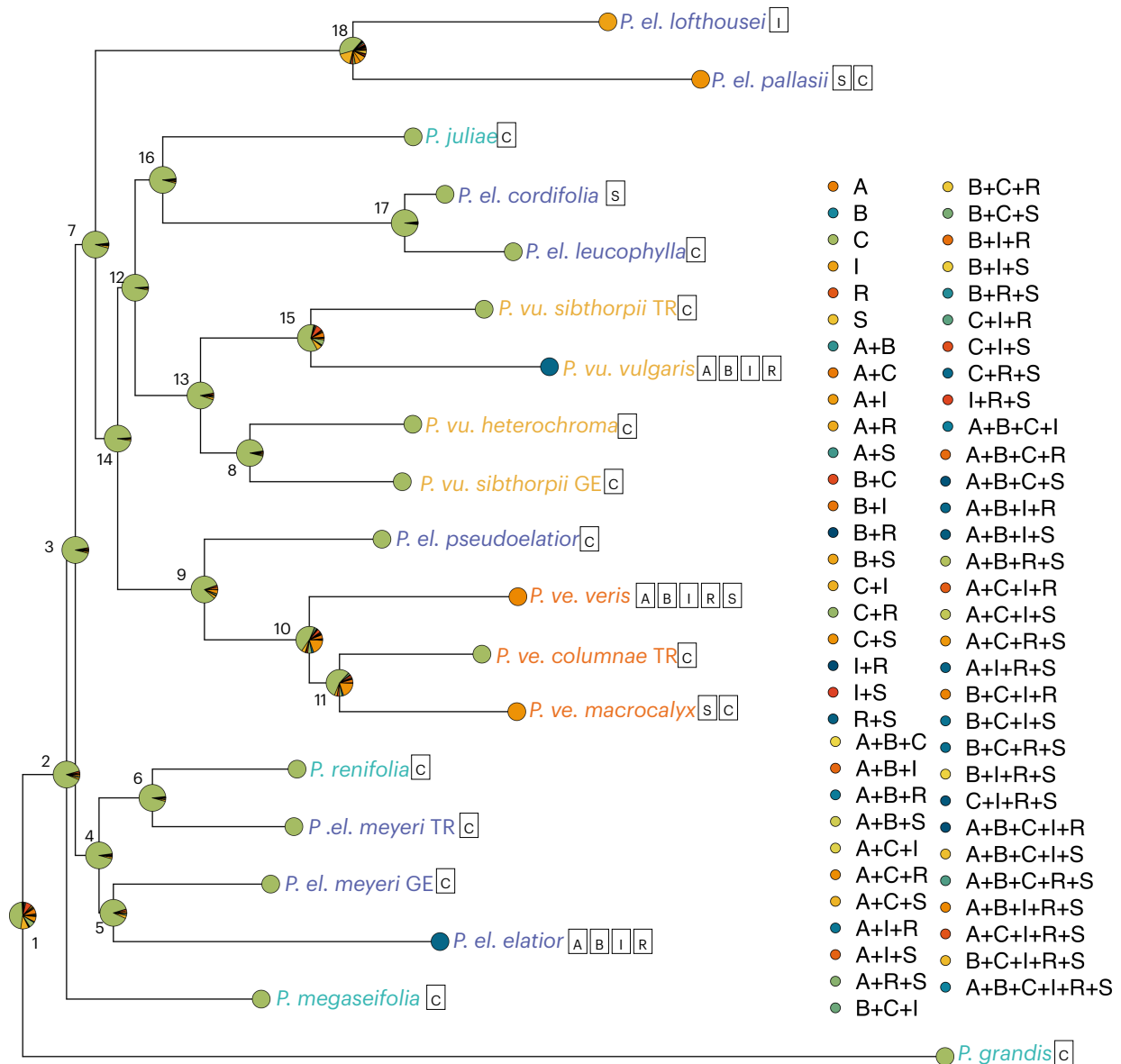
**Fig. S3** Chloroplast phylogeny of *Primula* sect. *Primula*. Branches with <90% bootstrap (BS) are collapsed. Outgroups not shown. Abbreviations: *P. ve.* = *P. veris*, *P. vu.* = *P. vulgaris*, *P. el.* = *P. elatior*, EN = England, CH = Switzerland, SK = Slovakia, GE = Georgia, TR = Turkey, ES = Spain, IR = Iran, RU = Russia.



**Fig. S4** S-locus phylogeny of *Primula* sect. *Primula*. Branches with <90% bootstrap (BS) are collapsed. S-locus phylogeny constructed from specimens with S-morph (short-styled) and homostylous specimens. Outgroups not shown. Abbreviations: *P. ve.* = *P. veris*, *P. vu.* = *P. vulgaris*, *P. el.* = *P. elatior*, EN = England, CH = Switzerland, SK = Slovakia, GE = Georgia, TR = Turkey, ES = Spain, IR = Iran, RU = Russia.

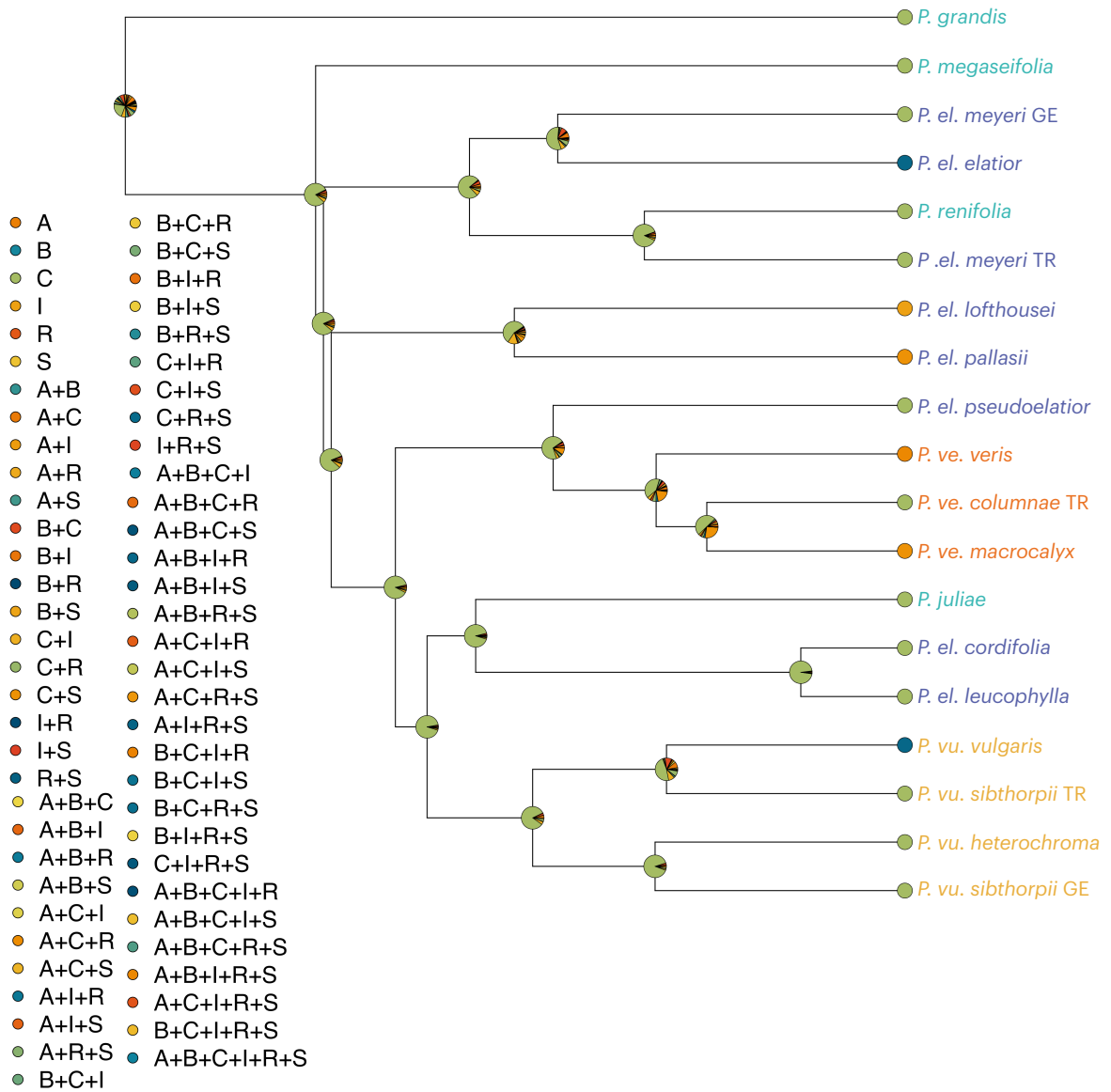


**Fig. S5** Evidence of gene flow in *Primula* sect. *Primula* with multispecies coalescent topology. Results of the Fbranch ( $f_b$ ) analysis in Dsuite. The values in the matrix signify excess allele sharing between the branch identified on the tree on the y-axis, which includes internal branches, and the species identified on the x-axis, relative to its sister branch. The light violet to dark purple gradient in the matrix refers to excess allele sharing, and white squares correspond to 0, non-significant values, or correspond to tests that are not consistent with the phylogeny. The tree is displayed in an ‘expanded’ form along the y axis, so that each branch, including internal branches, points to a corresponding row in the matrix. The two highest number of shared alleles are designated with A and B. A) Excess of shared alleles between *P. megaseifolia* and the ancestor of *P. el. elatior*, *P. el. meyeri*, and *P. renifolia*. B) Excess of shared alleles between *P. el. pseudoelatior* and the ancestor of *P. ve. macrocalyx* and *P. columnae*.



**Fig. S6** Ancestral range estimation under a Bayesian framework with phylogram. Branch lengths in units of molecular divergence. Pie chart at each node corresponds to the probability of each state at that node. All nodes reconstructed the Caucasus (green) as the range with the highest probability. All nodes are numbered to correspond to Supplementary Table S5, which provides the probability of every state at each node. A = Alps, B = British Isles, C = Caucasus, I = Iberian Peninsula, R = Carpathians, S = Siberia/northern Asia.





**Fig. S7** Ancestral range estimation under a Bayesian framework with chronogram. Branch lengths in units of time. Pie chart at each node corresponds to the probability of each state at that node. All nodes reconstructed the Caucasus (C) as the range with the highest probability. A = Alps, B = British Isles, C = Caucasus, I = Iberian Peninsula, R = Carpathians, S = Siberia/northern Asia.

TABLE S1. *Primula* specimens used in study. A = Alps, B = British Isles, C = Caucasus, I = Iberian Peninsula, R = Carpathians, S = Siberia/northern Asia.

Species	Subspecies	Collector Number	Specimen Number	Pin or Thrum	Country	Distribution	Date	Latitude Longitude	Herbarium
<i>P. elatior</i>	<i>cordifolia</i>	RS199	01	pin	GE	C	9 May 2019	41.7080, 43.5072	TB
			04	thrum					
<i>P. elatior</i>	<i>elatior</i>	BK004	01	thrum	CH	A, B, R	15 Apr 2019	47.3095, 7.71539	Z
			19	pin					
<i>P. elatior</i>	<i>elatior</i>	BK007	01	pin	CH	A, B, R	17 Apr 2019	46.5129, 7.3908	Z
			15	thrum					
<i>P. elatior</i>	<i>elatior</i>	EM007	09	pin	EN	A, B, R	9 Apr 2019	52.1367, -0.1290	Z
			10	thrum					
<i>P. elatior</i>	<i>elatior</i>	EM009	10	pin	EN	A, B, R	10 Apr 2019	52.1591, -0.1155	Z
			12	thrum					
<i>P. elatior</i>	<i>elatior</i>	JK002	10	pin	SK	A, B, R	1 May 2019	48.7727, 20.1044	Z
			11	thrum					
<i>P. elatior</i>	<i>elatior</i>	RS175	01	thrum	CH	A, B, R	19 Mar 2019	47.1983, 9.0120	Z
			20	pin					
<i>P. elatior</i>	<i>elatior</i>	RS184	02	thrum	SK	A, B, R	24 Apr 2019	48.8243, 19.0301	Z
			14	pin					
<i>P. elatior</i>	<i>elatior</i>	RS187	10	pin	SK	A, B, R	25 Apr 2019	49.1090, 19.1910	Z
			11	thrum					
<i>P. elatior</i>	<i>intricata</i>	RS179	01	thrum	ES	I	11 Apr 2019	42.7029, 0.7893	Z
			04	pin					
<i>P. elatior</i>	<i>leucophylla</i>	RS193	01	thrum	GE	C	6 May 2019	42.7054, 44.6216	TB
			02	pin					
<i>P. elatior</i>	<i>lofthousei</i>	RS207	02	pin	ES	C	15 Jul 2019	37.0113, -3.3842	Z
			03	thrum					
<i>P. elatior</i>	<i>meyeri</i>	RS194	03	thrum	GE	C	6 May 2019	42.6558, 44.6589	TB
			04	pin					

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Species	Subspecies	Collector Number	Specimen Number	Pin or Thrum	Country	Distribution	Date	Latitude Longitude	Herbarium
<i>P. elatior</i>	<i>meyeri</i>	RS204	02	pin	TR	C	24 Jun 2019	40.5225, 40.3863	ADO
			05	thrum					
<i>P. elatior</i>	<i>pallasii</i>	FC004	02	pin	TR	C, S	25 May 2019	40.0369, 40.5114	ADO
			03	thrum					
<i>P. elatior</i>	<i>pallasii</i>	RS200	01	pin	GE	C, S	9 May 2019	41.6931, 43.5155	TB
			04	thrum					
<i>P. elatior</i>	<i>pallasii</i>	RS201	02	pin	GE	C, S	9 May 2019	41.6926, 43.5516	TB
			03	thrum					
			04	thrum					
<i>P. elatior</i>	<i>pseudo-elatior</i>	FC006	02	thrum	TR	C	26 May 2019	40.8797, 41.1278	ADO
			03	thrum					
<i>P. grandis</i>		GT002	03	Homo-stylous	GE	C	7 Jul 2019	43.2061, 43.0814	TB
			05	Homo-stylous					
<i>P. grandis</i>		GT003	02	Homo-stylous	GE	C	7 Jul 2019	43.1244, 43.1261	TB
			03	Homo-stylous					
<i>P. juliae</i>		GT005	01	thrum	GE	C	15 Apr 2019	42.0053, 46.3564	TB
			03	pin					
<i>P. megaseifolia</i>		RS171	02	pin	TR	C	15 Mar 2019	41.0792, 40.8888	ADO
			07	thrum					
<i>P. renifolia</i>			02	pin	RU	C	8 Sep 2011	43.2400, 41.4400	GB
			10	thrum					
<i>P. veris</i>	<i>canescens</i>	RS177	01	pin	ES	I	11 Apr 2019	42.7068, 0.9105	Z
			04	thrum					
<i>P. veris</i>	<i>columnae</i>	BK008	01	thrum	CH	A	1 May 2019	47.4183, 7.7310	Z
			02	pin					
<i>P. veris</i>	<i>columnae</i>	FC001	02	thrum	TR	C	24 May 2019	40.6125, 40.2633	ADO
			04	pin					

TABLE S1. *Primula* specimens used in study. A = Alps, B = British Isles, C = Caucasus, I = Iberian Peninsula, R = Carpathians, S = Siberia/northern Asia.

Species	Subspecies	Collector Number	Specimen Number	Pin or Thrum	Country	Distribution	Date	Latitude Longitude	Herbarium
<i>P. veris</i>	<i>columnnae</i>	RS178	03	pin	ES	I	10	42.1112, 1.8331	Z
			04	thrum			Apr 2019		
<i>P. veris</i>	<i>macrocalyx</i>	FC002	01	pin	TR	C	25	41.0439, 42.2611	ADO
			02	thrum			May 2019		
<i>P. veris</i>	<i>macrocalyx</i>	RS190	01	pin	GE	C	5	41.6433, 44.6950	TB
			04	thrum			May 2019		
<i>P. veris</i>	<i>macrocalyx</i>	RS195	01	pin	GE	C	8	41.8725, 44.7698	TB
			02	pin			May 2019		
<i>P. veris</i>	<i>veris</i>	BK003	10	pin	CH	A, B, R, S	10	46.4433, 6.9147	Z
			11	thrum			Apr 2019		
<i>P. veris</i>	<i>veris</i>	BK006	01	thrum	CH	A, B, R, S	15	47.3095, 7.7154	Z
			20	pin			Apr 2019		
<i>P. veris</i>	<i>veris</i>	EM002	06	thrum	EN	A, B, R, S	5	51.3700, -2.3377	Z
			18	pin			Apr 2019		
<i>P. veris</i>	<i>veris</i>	EM004	01	thrum	EN	A, B, R, S	6	51.3536, -2.3286	Z
			20	pin			Apr 2019		
<i>P. veris</i>	<i>veris</i>	JK001	10	pin	SK	A, B, R, S	1	48.7727, 20.1044	Z
			11	thrum			May 2019		
<i>P. veris</i>	<i>veris</i>	RS181	01	thrum	SK	A, B, R, S	24	48.7704, 19.0547	Z
			20	pin			Apr 2019		
<i>P. veris</i>	<i>veris</i>	RS186	04	pin	SK	A, B, R, S	25	49.1090, 19.1910	Z
			18	thrum			Apr 2019		
<i>P. veris</i>	<i>veris</i>	RS189	01	thrum	SK	A, B, R, S	25	48.8294, 19.3067	Z
			16	pin			Apr 2019		
<i>P. vulgaris</i>	<i>balearica</i>	RS202	01	thrum	ES	I		39.6346,	Z

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Species	Subspecies	Collector Number	Specimen Number	Pin or Thrum	Country	Distribution	Date	Latitude Longitude	Herbarium
			04	pin			23 May 2019	2.4862	
<i>P. vulgaris</i>	<i>heterochroma</i>	PY001	03	thrum	IR	C	12 Apr 2019	37.1250, 49.8425	Z
<i>P. vulgaris</i>	<i>sibthorpii</i>	RS170	07	thrum	TR	C	14 Mar 2019	40.9381, 39.7507	ADO
<i>P. vulgaris</i>	<i>sibthorpii</i>	RS172	17	pin					
<i>P. vulgaris</i>	<i>sibthorpii</i>	RS172	01	thrum	TR	C	16 Mar 2019	41.0775, 40.7067	ADO
<i>P. vulgaris</i>	<i>sibthorpii</i>	RS172	03	pin					
<i>P. vulgaris</i>	<i>sibthorpii</i>	RS196	01	pin	GE	C	8 May 2019	41.8111, 43.5196	TB
<i>P. vulgaris</i>	<i>sibthorpii</i>	RS196	04	thrum					
<i>P. vulgaris</i>	<i>vulgaris</i>	BK001	10	pin	CH	A, B, R	10 Apr 2019	46.4433, 6.9147	Z
<i>P. vulgaris</i>	<i>vulgaris</i>	BK001	11	thrum					
<i>P. vulgaris</i>	<i>vulgaris</i>	EM001	02	thrum	EN	A, B, R	29 Mar 2019	51.0276, -2.6296	Z
<i>P. vulgaris</i>	<i>vulgaris</i>	EM001	11	pin					
<i>P. vulgaris</i>	<i>vulgaris</i>	EM003	01	thrum	EN	A, B, R	6 Apr 2019	51.3536, -2.3286	Z
<i>P. vulgaris</i>	<i>vulgaris</i>	EM003	20	pin					
<i>P. vulgaris</i>	<i>vulgaris</i>	EM006	10	pin	EN	A, B, R	9 Apr 2019	52.1367, -0.1290	Z
<i>P. vulgaris</i>	<i>vulgaris</i>	EM006	11	thrum					
<i>P. vulgaris</i>	<i>vulgaris</i>	RS174	02	thrum	CH	A, B, R	19 Mar 2019	47.1983, 9.0120	Z
<i>P. vulgaris</i>	<i>vulgaris</i>	RS174	19	pin					
<i>P. vulgaris</i>	<i>vulgaris</i>	RS180	01	thrum	SK	A, B, R	24 Apr 2019	48.7704, 19.0547	Z
<i>P. vulgaris</i>	<i>vulgaris</i>	RS180	09	pin					
<i>P. vulgaris</i>	<i>vulgaris</i>	RS183	01	thrum	SK	A, B, R	24 Apr 2019	48.8243, 19.0301	Z
<i>P. vulgaris</i>	<i>vulgaris</i>	RS183	10	pin					

TABLE S1. *Primula* specimens used in study. A = Alps, B = British Isles, C = Caucasus, I = Iberian Peninsula, R = Carpathians, S = Siberia/northern Asia.

Species	Subspecies	Collector Number	Specimen Number	Pin or Thrum	Country	Distribution	Date	Latitude Longitude	Herbarium
<i>P. siamensis</i>		375			TH		23 Jun 2002		Z
<i>P. souliei</i>		386			CN		1 May 2002		Z
<i>P. verticillata</i>		392			YE		1 Apr 1995		Z
<i>P. bouveana</i>		340			EG		1 Sep 2011		SCU
<i>Dionysia revoluta</i> ssp. <i>canescens</i>		149	07		IR		2 Apr 2001		Z
<i>P. halleri</i>		120703	01		AT		12 Jul 2003		Z
<i>P. mistassinica</i>		130904	01		CA		13 Sep 2004		Z
<i>P. nutans</i>		30705	02		NO		3 Jul 2005		Z



Branch	branch_descendants	Gra	Meg	ElaEla t	ElaMe yeGE	ElaMe yeTR	Ren	ElaPal l	ElaLo ft	ElaPs eu	VerVe ri	VerM acr	VerCo luTR	Jul	ElaCo rd	ElaLe uc	VulSi btGE	VulHe te	VulVul g	VulSi btTR
<b>B26</b>	Jul	0	0	0	0	0	0	0.015	0.015	0	0	0	0	nan	nan	nan	0	0	0	0
<b>B27</b>	Jul,ElaCord,ElaLeuc	0.018	0.008	0	0.010	0.011	0.010	0.006	0.005	0	0	0	0	nan	nan	nan	nan	nan	nan	nan
<b>B28</b>	ElaCord	0.002	0	0.002	0	0	0.002	0	0	0	0.006	0.008	0.005	0	nan	nan	0	0	0.007	0.003
<b>B29</b>	ElaCord,ElaLeuc	0	0.018	0.020	0.047	0.029	0.026	0	0	0.063	0.046	0.066	0.047	nan	nan	nan	0.041	0.042	0.044	0.051
<b>B30</b>	ElaLeuc	0	0	0	0	0	0	0	0	0	0	0	0	0.003	nan	nan	0	0	0	0
<b>B31</b>	VulSibtGE,VulHete,VulVulg,VulSibtTR,Jul,ElaCord,ElaLeuc	0.056	0.100	0.104	0.078	0.062	0.068	0.071	0.070	nan	nan	nan	nan	nan	nan	nan	nan	nan	nan	nan
<b>B32</b>	VulSibtGE	0	0	0.006	0.014	0.007	0.007	0	0	0.026	0.018	0.019	0.016	0.007	0.007	0.006	nan	nan	0.038	0.066
<b>B33</b>	VulSibtGE,VulHete	0.028	0.042	0	0.029	0.033	0.028	0.024	0.018	0.018	0.004	0.018	0.010	0.018	0.008	0.010	nan	nan	nan	nan
<b>B34</b>	VulHete	0	0	0	0	0	0	0.010	0.009	0	0	0	0	0	0	0	nan	nan	0	0
<b>B35</b>	VulSibtGE,VulHete,VulVulg,VulSibtTR	0	0	0	0	0	0	0	0	0	0	0	0	nan	nan	nan	nan	nan	nan	nan
<b>B36</b>	VulVulg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	nan	nan
<b>B37</b>	VulVulg,VulSibtTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	nan	nan	nan	nan
<b>B38</b>	VulSibtTR	0.021	0.038	0	0.028	0.028	0.026	0.020	0.013	0.030	0	0.016	0.017	0.032	0.026	0.027	0.115	0.100	nan	nan



SUPPLEMENTARY TABLE S3. Results from D<sub>FOIL</sub> analysis for *Primula* sect. *Primula*.

(P1,P2),(P3,P4),O	total	dtotal	T1 2	T3 4	T12 34	DFO_left	DFO_r ight	DFO_t otal	DFO_ stat	DFO_c hisq	DFO_P value	DIL_ left	DIL_r ight	DIL_t otal	DIL_ stat	DIL_c hisq	DIL_P value	DFL_ left	DFL_r ight	DFL_t otal	DFL_ stat	DFL_c hisq	DFL_P value	DOL_ left	DOL_r ight	DOL_t otal	DOL_ stat	DOL_c hisq	DOL_P value	introgre sion
(P. megaseifolia, P. megaseifolia), (P. renifolia, P. el. meyeri TR)	5056801	255863	0.005	0.012	0.023	88109	93171	181280	-0.028	141.350	0.0	8827	93053	181280	-0.027	128.477	0.0	44898	44341	89239	0.006	3.477	0.062	45016	44223	89239	0.009	7.047	0.008	14
(P. megaseifolia, P. megaseifolia), (P. el. elatior, P. el. meyeri GE)	4960390	344749	0.005	0.021	0.025	100419	173110	273529	-0.266	19317.811	0.0	100409	173120	273529	-0.266	19328.442	0.0	44112	43410	87522	0.008	5.631	0.018	44102	43420	87522	0.008	5.314	0.021	124
(P. el. pseudoelatior, P. el. pseudoelatior), (P. ve. columnae TR, P. ve. macrocalyx)	5129942	258490	0.005	0.011	0.020	101660	80012	181672	0.119	2579.571	0.0	101166	80506	181672	0.114	2349.485	0.0	51779	50125	101904	0.016	26.846	0.000	51285	50619	101904	0.007	4.353	0.037	13
(P. el. pseudoelatior, P. el. pseudoelatior), (P. ve. veris, P. ve. columnae TR)	5131224	283384	0.005	0.013	0.020	89127	117540	206667	-0.137	3906.277	0.0	89763	116904	206667	-0.131	3564.352	0.0	51223	50814	102037	0.004	1.639	0.200	51859	50178	102037	0.016	27.693	0.000	14
(P. el. pseudoelatior, P. el. pseudoelatior), (P. ve. veris, P. ve. macrocalyx))	5129465	288249	0.005	0.014	0.022	100848	107343	208191	-0.031	202.627	0.0	100923	107268	208191	-0.030	193.375	0.0	51212	50709	101921	0.005	2.482	0.115	51287	50634	101921	0.006	4.184	0.041	124

Supplementary Table S4. D-statistics and F4-ratios from Dsuite for all species trios in *Primula* sect. *Primula*.

<b>P1</b>	<b>P2</b>	<b>P3</b>	<b>Dstatistic</b>	<b>Z-score</b>	<b>p-value</b>	<b>f4-ratio</b>	<b>BBA</b>	<b>ABBA</b>	<b>BABA</b>
P. el. cordifolia	P. el. elatior	P. el. pallasii	0.078	11.204	0.000	0.030	88716	72521	62082
P. el. cordifolia	P. el. elatior	P. grandis	0.125	28.762	0.000	0.051	204301	66965	52079
P. el. cordifolia	P. el. leucophylla	P. juliae	0.017	3.575	0.000	0.003	276456	19880	19207
P. el. cordifolia	P. el. meyeri	P. grandis	0.185	44.943	0.000	0.072	205200	66521	45771
P. el. cordifolia	P. el. meyeri	P. grandis	0.177	37.115	0.000	0.072	198640	68585	47935
P. el. cordifolia	P. juliae	P. el. lofthousei	0.050	9.248	0.000	0.015	114874	53812	48665
P. el. cordifolia	P. juliae	P. el. pallasii	0.044	7.999	0.000	0.014	114123	55104	50433
P. el. cordifolia	P. megaseifolia	P. el. elatior	0.035	6.160	0.000	0.021	57485	70555	65836
P. el. cordifolia	P. megaseifolia	P. el. lofthousei	0.007	1.161	0.123	0.003	83197	62780	61872
P. el. cordifolia	P. megaseifolia	P. el. meyeri	0.024	4.088	0.000	0.021	50440	69906	66610
P. el. cordifolia	P. megaseifolia	P. el. pallasii	0.009	1.429	0.077	0.003	82062	65054	63921
P. el. cordifolia	P. megaseifolia	P. grandis	0.141	29.475	0.000	0.059	194457	68438	51537
P. el. cordifolia	P. megaseifolia	P. renifolia	0.081	13.752	0.000	0.055	52222	72693	61799
P. el. cordifolia	P. renifolia	P. grandis	0.199	43.726	0.000	0.080	199348	69873	46685
P. el. cordifolia	P. ve. veris	P. el. pseudoelatior	0.088	7.775	0.000	0.087	38725	101052	84781
P. el. cordifolia	P. vu. heterochroma	P. el. lofthousei	0.031	5.625	0.000	0.009	110526	56244	52883
P. el. cordifolia	P. vu. heterochroma	P. el. pallasii	0.031	5.527	0.000	0.010	109617	58177	54675
P. el. cordifolia	P. vu. sibthorpii GE	P. el. lofthousei	0.000	0.095	0.462	0.000	112388	53059	53007
P. el. cordifolia	P. vu. sibthorpii GE	P. el. pallasii	0.001	0.277	0.391	0.000	111482	54963	54803
P. el. elatior	P. el. cordifolia	P. ve. veris	0.131	21.341	0.000	0.070	105826	69111	53101
P. el. elatior	P. el. leucophylla	P. ve. veris	0.119	19.894	0.000	0.064	106156	68452	53892
P. el. elatior	P. el. meyeri	P. el. cordifolia	0.079	16.635	0.000	0.025	99448	53830	45918
P. el. elatior	P. el. meyeri	P. el. leucophylla	0.082	16.762	0.000	0.025	99281	54006	45795
P. el. elatior	P. el. meyeri	P. el. leucophylla	0.001	0.218	0.414	0.000	88704	53106	52988
P. el. elatior	P. el. meyeri	P. el. meyeri	0.062	11.227	0.000	0.048	69508	58775	51909
P. el. elatior	P. el. meyeri	P. el. pseudoelatior	0.095	18.346	0.000	0.044	111133	53342	44079
P. el. elatior	P. el. meyeri	P. el. pseudoelatior	0.022	4.843	0.000	0.011	99560	53116	50830
P. el. elatior	P. el. meyeri	P. grandis	0.065	17.654	0.000	0.022	235666	50011	43927
P. el. elatior	P. el. meyeri	P. grandis	0.062	16.237	0.000	0.023	220714	53804	47528
P. el. elatior	P. el. meyeri	P. juliae	0.051	11.128	0.000	0.017	104648	51641	46645
P. el. elatior	P. el. meyeri	P. megaseifolia	0.068	16.256	0.000	0.040	94496	52387	45705
P. el. elatior	P. el. meyeri	P. megaseifolia	0.058	11.347	0.000	0.037	80899	56159	49953
P. el. elatior	P. el. meyeri	P. ve. columnae	0.094	17.908	0.000	0.035	129044	51672	42755
P. el. elatior	P. el. meyeri	P. ve. columnae	0.033	6.953	0.000	0.013	116394	52317	48936
P. el. elatior	P. el. meyeri	P. ve. macrocalyx	0.096	19.426	0.000	0.043	129869	51948	42845
P. el. elatior	P. el. meyeri	P. ve. macrocalyx	0.031	6.567	0.000	0.015	117392	52404	49217
P. el. elatior	P. el. meyeri	P. ve. veris	0.077	14.479	0.000	0.030	149655	48808	41861
P. el. elatior	P. el. meyeri	P. ve. veris	0.032	6.287	0.000	0.014	136084	50712	47529
P. el. elatior	P. el. meyeri	P. vu. heterochroma	0.040	8.882	0.000	0.018	107247	52443	48438
P. el. elatior	P. el. meyeri	P. vu. sibthorpii GE	0.049	9.500	0.000	0.022	105422	53057	48100
P. el. elatior	P. el. meyeri	P. vu. sibthorpii TR	0.010	2.315	0.010	0.004	110420	52584	51505
P. el. elatior	P. el. pseudoelatior	P. el. cordifolia	0.069	7.735	0.000	0.033	55772	78950	68714

<b>P1</b>	<b>P2</b>	<b>P3</b>	<b>Dstatistic</b>	<b>Z-score</b>	<b>p-value</b>	<b>f4-ratio</b>	<b>BBAA</b>	<b>ABBA</b>	<b>BABA</b>
P. el. elatior	P. el. pseudoelatior	P. el. leucophylla	0.069	7.806	0.000	0.031	56293	78965	68814
P. el. elatior	P. el. pseudoelatior	P. juliae	0.018	2.182	0.015	0.009	62090	72464	69935
P. el. elatior	P. el. pseudoelatior	P. vu. heterochroma	0.027	3.439	0.000	0.018	62798	75156	71254
P. el. elatior	P. el. pseudoelatior	P. vu. sibthorpii GE	0.052	6.211	0.000	0.034	60438	77830	70140
P. el. elatior	P. el. pseudoelatior	P. vu. sibthorpii TR	0.016	2.093	0.018	0.010	65042	76296	73839
P. el. elatior	P. juliae	P. ve. columnae	0.051	8.818	0.000	0.026	87195	67667	61058
P. el. elatior	P. juliae	P. ve. macrocalyx	0.047	7.953	0.000	0.029	88241	67549	61540
P. el. elatior	P. juliae	P. ve. veris	0.034	5.516	0.000	0.019	106350	63778	59534
P. el. elatior	P. megaseifolia	P. grandis	0.020	5.167	0.000	0.008	199486	59384	57052
P. el. elatior	P. renifolia	P. el. cordifolia	0.013	2.504	0.006	0.004	92931	52153	50863
P. el. elatior	P. renifolia	P. el. leucophylla	0.013	2.514	0.006	0.004	93051	52189	50857
P. el. elatior	P. renifolia	P. el. pseudoelatior	0.020	3.828	0.000	0.010	104584	51274	49253
P. el. elatior	P. renifolia	P. grandis	0.087	21.426	0.000	0.031	225240	53786	45143
P. el. elatior	P. renifolia	P. juliae	0.003	0.612	0.270	0.001	97490	51281	50956
P. el. elatior	P. renifolia	P. megaseifolia	0.075	14.940	0.000	0.046	84988	55371	47681
P. el. elatior	P. renifolia	P. ve. columnae	0.015	2.565	0.005	0.006	122287	49305	47875
P. el. elatior	P. renifolia	P. ve. macrocalyx	0.014	2.574	0.005	0.007	123249	49498	48093
P. el. elatior	P. ve. veris	P. el. pseudoelatior	0.199	20.889	0.000	0.184	39144	118403	79134
P. el. elatior	P. vu. heterochroma	P. ve. columnae	0.064	11.062	0.000	0.032	89120	70095	61712
P. el. elatior	P. vu. heterochroma	P. ve. macrocalyx	0.057	9.919	0.000	0.035	90292	69767	62292
P. el. elatior	P. vu. heterochroma	P. ve. veris	0.047	7.567	0.000	0.026	108947	66151	60227
P. el. elatior	P. vu. sibthorpii GE	P. ve. columnae	0.094	15.926	0.000	0.048	88145	71998	59656
P. el. elatior	P. vu. sibthorpii GE	P. ve. macrocalyx	0.087	14.766	0.000	0.054	89225	71571	60157
P. el. elatior	P. vu. sibthorpii GE	P. ve. veris	0.079	12.784	0.000	0.044	107690	67971	58030
P. el. elatior	P. vu. sibthorpii TR	P. ve. columnae	0.055	9.034	0.000	0.029	92091	71634	64101
P. el. elatior	P. vu. sibthorpii TR	P. ve. macrocalyx	0.040	6.690	0.000	0.025	93482	70243	64892
P. el. elatior	P. vu. sibthorpii TR	P. ve. veris	0.032	5.154	0.000	0.018	112319	66877	62764
P. el. elatior	P. vu. vulgaris	P. ve. columnae	0.022	3.233	0.001	0.012	95900	71100	68030
P. el. elatior	P. vu. vulgaris	P. ve. macrocalyx	0.014	2.079	0.019	0.009	97060	70540	68606
P. el. elatior	P. vu. vulgaris	P. ve. veris	0.032	4.497	0.000	0.019	114955	69772	65470
P. el. leucophylla	P. el. cordifolia	P. el. elatior	0.010	2.577	0.005	0.002	319960	18172	17796
P. el. leucophylla	P. el. cordifolia	P. el. lothousei	0.006	1.321	0.093	0.001	340056	16829	16627
P. el. leucophylla	P. el. cordifolia	P. el. meyeri	0.002	0.336	0.368	0.000	309797	18135	18080
P. el. leucophylla	P. el. cordifolia	P. el. meyeri	0.004	1.038	0.150	0.001	314515	17638	17485
P. el. leucophylla	P. el. cordifolia	P. el. pallasii	0.005	1.103	0.135	0.000	342003	17483	17313
P. el. leucophylla	P. el. cordifolia	P. el. pseudoelatior	0.009	1.917	0.028	0.002	307918	18789	18464
P. el. leucophylla	P. el. cordifolia	P. grandis	0.020	5.487	0.000	0.002	466203	16684	16028
P. el. leucophylla	P. el. cordifolia	P. megaseifolia	0.005	1.256	0.104	0.001	323772	17321	17144
P. el. leucophylla	P. el. cordifolia	P. renifolia	0.011	2.415	0.008	0.002	315369	17906	17526
P. el. leucophylla	P. el. cordifolia	P. ve. columnae	0.032	4.359	0.000	0.005	331544	19006	17830
P. el. leucophylla	P. el. cordifolia	P. ve. macrocalyx	0.040	4.736	0.000	0.008	332293	19833	18315
P. el. leucophylla	P. el. cordifolia	P. ve. veris	0.035	5.094	0.000	0.006	356073	17563	16376
P. el. leucophylla	P. el. cordifolia	P. vu. heterochroma	0.003	0.844	0.199	0.001	290480	19355	19224

<b>P1</b>	<b>P2</b>	<b>P3</b>	<b>Dstatistic</b>	<b>Z-score</b>	<b>p-value</b>	<b>f4-ratio</b>	<b>BBAA</b>	<b>ABBA</b>	<b>BABA</b>
P. el. leucophylla	P. el. cordifolia	P. vu. sibthorpii GE	0.003	0.766	0.222	0.001	287777	19352	19230
P. el. leucophylla	P. el. cordifolia	P. vu. sibthorpii TR	0.017	3.685	0.000	0.003	290325	20245	19565
P. el. leucophylla	P. el. cordifolia	P. vu. vulgaris	0.043	9.899	0.000	0.007	298390	20591	18906
P. el. leucophylla	P. el. elatior	P. el. pallasii	0.080	11.711	0.000	0.032	88903	73095	62247
P. el. leucophylla	P. el. elatior	P. grandis	0.130	30.128	0.000	0.054	202809	67277	51791
P. el. leucophylla	P. el. meyeri	P. el. lofthousei	0.003	0.532	0.297	0.001	89317	60136	59751
P. el. leucophylla	P. el. meyeri	P. el. pallasii	0.001	0.194	0.423	0.000	88245	61931	61788
P. el. leucophylla	P. el. meyeri	P. grandis	0.190	47.616	0.000	0.075	203950	66733	45420
P. el. leucophylla	P. el. meyeri	P. grandis	0.182	39.259	0.000	0.075	197387	68820	47625
P. el. leucophylla	P. juliae	P. el. lofthousei	0.054	9.979	0.000	0.016	115882	54183	48631
P. el. leucophylla	P. juliae	P. el. pallasii	0.048	8.743	0.000	0.015	115095	55453	50393
P. el. leucophylla	P. megaseifolia	P. el. elatior	0.038	6.723	0.000	0.024	57662	70902	65738
P. el. leucophylla	P. megaseifolia	P. el. lofthousei	0.011	1.827	0.034	0.004	83569	63339	61921
P. el. leucophylla	P. megaseifolia	P. el. meyeri	0.025	4.161	0.000	0.022	50493	70066	66668
P. el. leucophylla	P. megaseifolia	P. el. pallasii	0.013	2.063	0.020	0.005	82372	65600	63959
P. el. leucophylla	P. megaseifolia	P. grandis	0.146	30.380	0.000	0.062	193226	68745	51225
P. el. leucophylla	P. renifolia	P. grandis	0.204	45.828	0.000	0.083	197927	70184	46412
P. el. leucophylla	P. ve. veris	P. el. pseudoelatior	0.089	7.920	0.000	0.089	38318	101850	85286
P. el. leucophylla	P. vu. heterochroma	P. el. lofthousei	0.034	6.166	0.000	0.010	110939	56784	53042
P. el. leucophylla	P. vu. heterochroma	P. el. pallasii	0.034	5.943	0.000	0.011	109948	58707	54830
P. el. leucophylla	P. vu. sibthorpii GE	P. el. lofthousei	0.004	0.839	0.201	0.001	112773	53591	53122
P. el. leucophylla	P. vu. sibthorpii GE	P. el. pallasii	0.005	0.936	0.175	0.002	111817	55468	54914
P. el. lofthousei	P. el. cordifolia	P. el. elatior	0.087	9.146	0.000	0.062	59192	88901	74700
P. el. lofthousei	P. el. cordifolia	P. grandis	0.082	17.953	0.000	0.037	189024	70974	60226
P. el. lofthousei	P. el. elatior	P. grandis	0.189	43.150	0.000	0.087	199590	79630	54350
P. el. lofthousei	P. el. leucophylla	P. el. elatior	0.084	9.010	0.000	0.061	59343	89121	75284
P. el. lofthousei	P. el. leucophylla	P. grandis	0.076	16.863	0.000	0.036	187801	70951	60886
P. el. lofthousei	P. el. meyeri	P. grandis	0.226	54.513	0.000	0.107	179536	84193	53153
P. el. lofthousei	P. el. meyeri	P. grandis	0.229	52.500	0.000	0.108	180881	83271	52220
P. el. lofthousei	P. el. pallasii	P. el. cordifolia	0.043	8.695	0.000	0.009	260619	36312	33347
P. el. lofthousei	P. el. pallasii	P. el. leucophylla	0.043	8.955	0.000	0.009	260943	36553	33547
P. el. lofthousei	P. el. pallasii	P. el. meyeri	0.063	12.086	0.000	0.023	264739	37303	32882
P. el. lofthousei	P. el. pallasii	P. el. meyeri	0.044	8.450	0.000	0.015	260627	36706	33636
P. el. lofthousei	P. el. pallasii	P. el. pseudoelatior	0.046	8.128	0.000	0.013	278993	35874	32724
P. el. lofthousei	P. el. pallasii	P. grandis	0.035	10.911	0.000	0.008	389859	33776	31462
P. el. lofthousei	P. el. pallasii	P. juliae	0.038	7.523	0.000	0.009	254076	36375	33686
P. el. lofthousei	P. el. pallasii	P. megaseifolia	0.048	9.994	0.000	0.018	260842	37293	33849
P. el. lofthousei	P. el. pallasii	P. renifolia	0.048	9.474	0.000	0.015	263649	36684	33310
P. el. lofthousei	P. el. pallasii	P. ve. columnae	0.030	5.210	0.000	0.007	298786	34409	32428
P. el. lofthousei	P. el. pallasii	P. ve. macrocalyx	0.028	5.035	0.000	0.008	300531	34417	32522
P. el. lofthousei	P. el. pallasii	P. ve. veris	0.004	0.698	0.242	0.001	319552	32569	32294
P. el. lofthousei	P. el. pallasii	P. vu. heterochroma	0.047	9.573	0.000	0.015	260078	37763	34355
P. el. lofthousei	P. el. pallasii	P. vu. sibthorpii GE	0.048	9.488	0.000	0.014	262496	37562	34141

<b>P1</b>	<b>P2</b>	<b>P3</b>	<b>Dstatistic</b>	<b>Z-score</b>	<b>p-value</b>	<b>f4-ratio</b>	<b>BBAA</b>	<b>ABBA</b>	<b>BABA</b>
P. el. lofthousei	P. el. pallasii	P. vu. sibthorpii TR	0.040	7.812	0.000	0.011	269625	37729	34861
P. el. lofthousei	P. el. pallasii	P. vu. vulgaris	0.012	2.309	0.010	0.003	276102	36959	36100
P. el. lofthousei	P. el. pseudoelator	P. el. elatior	0.009	1.154	0.124	0.007	54091	88951	87347
P. el. lofthousei	P. el. pseudoelator	P. el. meyeri	0.122	15.021	0.000	0.097	53713	90373	70786
P. el. lofthousei	P. el. pseudoelator	P. juliae	0.133	15.166	0.000	0.075	50312	94595	72398
P. el. lofthousei	P. el. pseudoelator	P. megaseifolia	0.040	4.597	0.000	0.032	57520	82067	75797
P. el. lofthousei	P. el. pseudoelator	P. vu. heterochroma	0.151	21.378	0.000	0.111	51649	98416	72543
P. el. lofthousei	P. juliae	P. el. elatior	0.060	6.784	0.000	0.042	64460	83999	74505
P. el. lofthousei	P. juliae	P. grandis	0.071	16.134	0.000	0.032	192624	68206	59154
P. el. lofthousei	P. megaseifolia	P. grandis	0.208	41.463	0.000	0.095	182198	79470	52148
P. el. lofthousei	P. megaseifolia	P. ve. veris	0.169	24.178	0.000	0.086	111179	76668	54532
P. el. lofthousei	P. renifolia	P. grandis	0.243	55.812	0.000	0.116	179157	85385	51961
P. el. lofthousei	P. ve. columnae	P. el. cordifolia	0.101	10.667	0.000	0.056	46572	101053	82448
P. el. lofthousei	P. ve. columnae	P. el. leucophylla	0.097	10.341	0.000	0.051	47488	100765	83013
P. el. lofthousei	P. ve. columnae	P. el. meyeri	0.061	5.743	0.000	0.056	49766	94187	83341
P. el. lofthousei	P. ve. columnae	P. el. meyeri	0.017	1.943	0.026	0.015	50861	89660	86587
P. el. lofthousei	P. ve. columnae	P. juliae	0.007	0.760	0.223	0.004	48754	90484	89266
P. el. lofthousei	P. ve. columnae	P. renifolia	0.016	1.539	0.062	0.012	51874	88991	86231
P. el. lofthousei	P. ve. columnae	P. vu. heterochroma	0.022	2.823	0.002	0.017	50061	94067	90043
P. el. lofthousei	P. ve. columnae	P. vu. sibthorpii GE	0.063	7.422	0.000	0.047	49752	97565	85996
P. el. lofthousei	P. ve. columnae	P. vu. sibthorpii TR	0.058	7.063	0.000	0.040	54582	97988	87231
P. el. lofthousei	P. ve. columnae	P. vu. vulgaris	0.062	7.498	0.000	0.037	59283	98541	87067
P. el. lofthousei	P. ve. macrocalyx	P. el. cordifolia	0.107	10.540	0.000	0.059	46205	102664	82826
P. el. lofthousei	P. ve. macrocalyx	P. el. leucophylla	0.101	10.261	0.000	0.053	47142	102039	83395
P. el. lofthousei	P. ve. macrocalyx	P. el. meyeri	0.059	5.402	0.000	0.055	49750	94687	84066
P. el. lofthousei	P. ve. macrocalyx	P. el. meyeri	0.014	1.530	0.063	0.012	50967	89962	87471
P. el. lofthousei	P. ve. macrocalyx	P. juliae	0.001	0.117	0.453	0.001	49000	90494	90300
P. el. lofthousei	P. ve. macrocalyx	P. renifolia	0.013	1.263	0.103	0.010	51922	89393	87053
P. el. lofthousei	P. ve. macrocalyx	P. vu. heterochroma	0.015	1.858	0.032	0.012	50315	93788	91099
P. el. lofthousei	P. ve. macrocalyx	P. vu. sibthorpii GE	0.056	6.418	0.000	0.041	49972	97226	86965
P. el. lofthousei	P. ve. macrocalyx	P. vu. sibthorpii TR	0.045	5.400	0.000	0.030	55052	96712	88464
P. el. lofthousei	P. ve. macrocalyx	P. vu. vulgaris	0.054	6.316	0.000	0.032	59562	98086	88089
P. el. lofthousei	P. ve. veris	P. el. pseudoelator	0.335	44.674	0.000	0.310	35182	147775	73533
P. el. lofthousei	P. vu. heterochroma	P. el. elatior	0.059	6.553	0.000	0.042	64753	86496	76856
P. el. lofthousei	P. vu. heterochroma	P. grandis	0.049	11.107	0.000	0.022	195041	68700	62322
P. el. lofthousei	P. vu. sibthorpii GE	P. el. elatior	0.066	7.599	0.000	0.048	61989	88493	77516
P. el. lofthousei	P. vu. sibthorpii GE	P. grandis	0.048	10.390	0.000	0.022	192397	69600	63206
P. el. lofthousei	P. vu. sibthorpii TR	P. el. elatior	0.057	6.748	0.000	0.043	61907	91769	81866
P. el. lofthousei	P. vu. sibthorpii TR	P. grandis	0.009	1.628	0.052	0.004	193834	69635	68457
P. el. lofthousei	P. vu. vulgaris	P. el. elatior	0.053	6.599	0.000	0.042	61223	95948	86208
P. el. lofthousei	P. vu. vulgaris	P. megaseifolia	0.045	6.961	0.000	0.036	65617	82901	75816
P. el. meyeri	P. el. cordifolia	P. el. lofthousei	0.025	4.618	0.000	0.008	95304	58018	55152
P. el. meyeri	P. el. cordifolia	P. el. lofthousei	0.001	0.157	0.438	0.000	88913	59654	59540

<b>P1</b>	<b>P2</b>	<b>P3</b>	<b>Dstatistic</b>	<b>Z-score</b>	<b>p-value</b>	<b>f4-ratio</b>	<b>BBAA</b>	<b>ABBA</b>	<b>BABA</b>
P. el. meyeri	P. el. cordifolia	P. el. pallasii	0.015	2.712	0.003	0.005	93842	59486	57765
P. el. meyeri	P. el. cordifolia	P. el. pallasii	0.003	0.440	0.330	0.001	87872	61682	61354
P. el. meyeri	P. el. cordifolia	P. ve. columnae	0.088	13.070	0.000	0.044	85563	66018	55298
P. el. meyeri	P. el. cordifolia	P. ve. macrocalyx	0.100	14.840	0.000	0.061	85799	67439	55206
P. el. meyeri	P. el. cordifolia	P. ve. veris	0.080	11.636	0.000	0.041	105384	61576	52503
P. el. meyeri	P. el. cordifolia	P. ve. veris	0.105	17.157	0.000	0.057	101136	66135	53558
P. el. meyeri	P. el. elatior	P. el. cordifolia	0.001	0.228	0.410	0.000	88626	53039	52915
P. el. meyeri	P. el. elatior	P. el. lofthousei	0.175	18.913	0.000	0.050	128324	61667	43317
P. el. meyeri	P. el. elatior	P. el. lofthousei	0.137	17.083	0.000	0.043	113099	63971	48591
P. el. meyeri	P. el. elatior	P. el. pallasii	0.114	15.048	0.000	0.035	128656	58681	46638
P. el. meyeri	P. el. elatior	P. el. pallasii	0.093	13.288	0.000	0.031	113623	61684	51148
P. el. meyeri	P. el. elatior	P. juliae	0.007	1.412	0.079	0.003	93131	52951	52209
P. el. meyeri	P. el. elatior	P. vu. heterochroma	0.014	3.132	0.001	0.007	95241	54551	52996
P. el. meyeri	P. el. elatior	P. vu. sibthorpii GE	0.016	3.189	0.001	0.007	93874	54666	52971
P. el. meyeri	P. el. elatior	P. vu. sibthorpii TR	0.050	11.304	0.000	0.022	98751	58113	52576
P. el. meyeri	P. el. elatior	P. vu. vulgaris	0.034	6.787	0.000	0.012	114665	55464	51838
P. el. meyeri	P. el. elatior	P. vu. vulgaris	0.095	20.077	0.000	0.037	103205	62313	51464
P. el. meyeri	P. el. leucophylla	P. el. lofthousei	0.021	3.923	0.000	0.007	95808	58148	55739
P. el. meyeri	P. el. leucophylla	P. el. pallasii	0.011	2.024	0.021	0.004	94258	59581	58288
P. el. meyeri	P. el. leucophylla	P. ve. columnae	0.077	11.600	0.000	0.038	86122	65320	56007
P. el. meyeri	P. el. leucophylla	P. ve. macrocalyx	0.086	13.819	0.000	0.053	86421	66447	55957
P. el. meyeri	P. el. leucophylla	P. ve. veris	0.067	10.045	0.000	0.035	105947	60856	53206
P. el. meyeri	P. el. leucophylla	P. ve. veris	0.093	15.828	0.000	0.051	101678	65479	54319
P. el. meyeri	P. el. meyeri	P. el. cordifolia	0.080	17.476	0.000	0.026	87679	53502	45561
P. el. meyeri	P. el. meyeri	P. el. leucophylla	0.081	17.247	0.000	0.025	87621	53593	45601
P. el. meyeri	P. el. meyeri	P. el. lofthousei	0.031	5.479	0.000	0.008	118362	47546	44718
P. el. meyeri	P. el. meyeri	P. el. pallasii	0.015	2.791	0.003	0.004	117646	48732	47288
P. el. meyeri	P. el. meyeri	P. el. pseudoelatior	0.071	14.497	0.000	0.033	97831	51974	45107
P. el. meyeri	P. el. meyeri	P. grandis	0.002	0.439	0.330	0.001	220282	47326	47156
P. el. meyeri	P. el. meyeri	P. juliae	0.058	11.929	0.000	0.020	93034	51371	45706
P. el. meyeri	P. el. meyeri	P. megaseifolia	0.005	0.915	0.180	0.003	80404	49446	48982
P. el. meyeri	P. el. meyeri	P. ve. columnae	0.058	11.480	0.000	0.022	114509	49906	44474
P. el. meyeri	P. el. meyeri	P. ve. macrocalyx	0.062	12.250	0.000	0.028	115368	50244	44422
P. el. meyeri	P. el. meyeri	P. ve. veris	0.041	7.493	0.000	0.016	134432	47051	43381
P. el. meyeri	P. el. meyeri	P. vu. heterochroma	0.056	12.462	0.000	0.025	95398	52241	46716
P. el. meyeri	P. el. meyeri	P. vu. sibthorpii GE	0.067	13.766	0.000	0.029	93683	52938	46335
P. el. meyeri	P. el. meyeri	P. vu. sibthorpii TR	0.066	14.903	0.000	0.026	99364	53346	46732
P. el. meyeri	P. el. meyeri	P. vu. vulgaris	0.072	16.136	0.000	0.025	104528	53610	46369
P. el. meyeri	P. el. pseudoelatior	P. el. cordifolia	0.018	2.071	0.019	0.008	56803	70729	68250
P. el. meyeri	P. el. pseudoelatior	P. el. cordifolia	0.074	8.421	0.000	0.034	55583	76186	65657
P. el. meyeri	P. el. pseudoelatior	P. el. leucophylla	0.015	1.786	0.037	0.007	57212	70665	68576
P. el. meyeri	P. el. pseudoelatior	P. el. leucophylla	0.072	8.234	0.000	0.032	56066	76167	65953
P. el. meyeri	P. el. pseudoelatior	P. juliae	0.026	3.093	0.001	0.013	62052	70014	66436

<b>P1</b>	<b>P2</b>	<b>P3</b>	<b>Dstatistic</b>	<b>Z-score</b>	<b>p-value</b>	<b>f4-ratio</b>	<b>BBAA</b>	<b>ABBA</b>	<b>BABA</b>
P. el. meyeri	P. el. pseudoelator	P. vu. heterochroma	0.001	0.091	0.464	0.000	64991	68073	67983
P. el. meyeri	P. el. pseudoelator	P. vu. sibthorpii GE	0.021	2.728	0.003	0.013	62172	70294	67390
P. el. meyeri	P. el. pseudoelator	P. vu. vulgaris	0.001	0.124	0.450	0.000	73046	68724	68602
P. el. meyeri	P. juliae	P. el. lofthousei	0.067	11.597	0.000	0.023	88500	64125	56046
P. el. meyeri	P. juliae	P. el. lofthousei	0.042	6.556	0.000	0.015	83644	64996	59749
P. el. meyeri	P. juliae	P. el. pallasii	0.051	9.580	0.000	0.019	87198	65433	59047
P. el. meyeri	P. juliae	P. el. pallasii	0.039	6.447	0.000	0.015	82773	66829	61850
P. el. meyeri	P. juliae	P. el. pseudoelator	0.009	1.411	0.079	0.006	67602	65309	64122
P. el. meyeri	P. juliae	P. ve. columnae	0.025	3.976	0.000	0.013	82731	64968	61785
P. el. meyeri	P. juliae	P. ve. macrocalyx	0.022	3.518	0.000	0.014	83778	64892	62084
P. el. meyeri	P. juliae	P. ve. veris	0.009	1.235	0.108	0.005	101301	61173	60124
P. el. meyeri	P. megaseifolia	P. el. lofthousei	0.036	6.582	0.000	0.011	95806	56181	52291
P. el. meyeri	P. megaseifolia	P. el. lofthousei	0.010	1.773	0.038	0.003	94358	55341	54299
P. el. meyeri	P. megaseifolia	P. el. pallasii	0.026	4.772	0.000	0.009	94569	58024	55044
P. el. meyeri	P. megaseifolia	P. el. pallasii	0.013	2.400	0.008	0.004	93500	57524	56049
P. el. meyeri	P. renifolia	P. el. cordifolia	0.018	3.798	0.000	0.004	137542	39331	37943
P. el. meyeri	P. renifolia	P. el. elatior	0.069	14.915	0.000	0.033	106584	47657	41499
P. el. meyeri	P. renifolia	P. el. leucophylla	0.015	3.152	0.001	0.004	136998	39303	38108
P. el. meyeri	P. renifolia	P. el. lofthousei	0.010	2.257	0.012	0.003	123828	44570	43646
P. el. meyeri	P. renifolia	P. el. meyeri	0.073	13.652	0.000	0.052	98330	46896	40546
P. el. meyeri	P. renifolia	P. grandis	0.027	6.699	0.000	0.009	224853	47130	44644
P. el. meyeri	P. renifolia	P. grandis	0.031	7.997	0.000	0.009	267514	39026	36708
P. el. meyeri	P. renifolia	P. juliae	0.014	2.894	0.002	0.004	141977	38712	37636
P. el. meyeri	P. renifolia	P. megaseifolia	0.010	2.017	0.022	0.006	84357	47890	46910
P. el. meyeri	P. renifolia	P. megaseifolia	0.018	3.711	0.000	0.009	127213	39759	38328
P. el. meyeri	P. renifolia	P. vu. heterochroma	0.008	1.701	0.044	0.003	145070	39194	38594
P. el. meyeri	P. renifolia	P. vu. sibthorpii GE	0.010	2.268	0.012	0.003	143564	39334	38552
P. el. meyeri	P. renifolia	P. vu. sibthorpii TR	0.014	3.192	0.001	0.004	149513	39817	38742
P. el. meyeri	P. renifolia	P. vu. vulgaris	0.012	2.713	0.003	0.003	154951	39544	38605
P. el. meyeri	P. ve. veris	P. el. pseudoelator	0.159	14.761	0.000	0.149	37939	109683	79583
P. el. meyeri	P. ve. veris	P. el. pseudoelator	0.195	19.954	0.000	0.179	38780	113631	76502
P. el. meyeri	P. vu. heterochroma	P. el. lofthousei	0.051	8.711	0.000	0.017	90364	64789	58467
P. el. meyeri	P. vu. heterochroma	P. el. lofthousei	0.028	4.594	0.000	0.010	85514	65481	61973
P. el. meyeri	P. vu. heterochroma	P. el. pallasii	0.041	6.864	0.000	0.015	89076	66754	61504
P. el. meyeri	P. vu. heterochroma	P. el. pallasii	0.029	4.903	0.000	0.011	84621	67935	64084
P. el. meyeri	P. vu. heterochroma	P. ve. columnae	0.038	6.029	0.000	0.019	83719	67315	62421
P. el. meyeri	P. vu. heterochroma	P. ve. macrocalyx	0.032	5.319	0.000	0.021	84863	67004	62792
P. el. meyeri	P. vu. heterochroma	P. ve. veris	0.021	3.144	0.001	0.012	102937	63433	60813
P. el. meyeri	P. vu. sibthorpii GE	P. el. lofthousei	0.024	4.265	0.000	0.008	92767	61484	58645
P. el. meyeri	P. vu. sibthorpii GE	P. el. lofthousei	0.001	0.124	0.450	0.000	87151	62547	62461
P. el. meyeri	P. vu. sibthorpii GE	P. el. pallasii	0.014	2.511	0.006	0.005	91445	63372	61625
P. el. meyeri	P. vu. sibthorpii GE	P. el. pallasii	0.004	0.641	0.261	0.001	86261	65015	64553
P. el. meyeri	P. vu. sibthorpii GE	P. ve. columnae	0.027	4.091	0.000	0.014	85178	64578	61134

<b>P1</b>	<b>P2</b>	<b>P3</b>	<b>Dstatistic</b>	<b>Z-score</b>	<b>p-value</b>	<b>f4-ratio</b>	<b>BBAA</b>	<b>ABBA</b>	<b>BABA</b>
P. el. meyeri	P. vu. sibthorpii GE	P. ve. columnnae	0.068	11.280	0.000	0.035	82627	69146	60324
P. el. meyeri	P. vu. sibthorpii GE	P. ve. macrocalyx	0.018	2.867	0.002	0.012	86083	64007	61689
P. el. meyeri	P. vu. sibthorpii GE	P. ve. macrocalyx	0.063	10.684	0.000	0.040	83687	68754	60639
P. el. meyeri	P. vu. sibthorpii GE	P. ve. veris	0.025	3.663	0.000	0.014	104985	61185	58167
P. el. meyeri	P. vu. sibthorpii GE	P. ve. veris	0.053	8.610	0.000	0.030	101603	65232	58608
P. el. meyeri	P. vu. sibthorpii TR	P. ve. columnnae	0.030	4.678	0.000	0.016	83502	69643	65595
P. el. meyeri	P. vu. sibthorpii TR	P. ve. macrocalyx	0.016	2.602	0.005	0.010	84878	68305	66183
P. el. meyeri	P. vu. sibthorpii TR	P. ve. veris	0.006	0.991	0.161	0.004	103085	64937	64105
P. el. meyeri	P. vu. vulgaris	P. el. cordifolia	0.102	12.531	0.000	0.052	53687	85894	69959
P. el. meyeri	P. vu. vulgaris	P. el. leucophylla	0.093	11.108	0.000	0.045	54315	84673	70334
P. el. meyeri	P. vu. vulgaris	P. el. pseudoelator	0.018	2.783	0.003	0.013	66344	73822	71166
P. el. meyeri	P. vu. vulgaris	P. ve. veris	0.008	1.039	0.149	0.005	101292	68689	67663
P. el. pallasii	P. el. cordifolia	P. grandis	0.064	14.490	0.000	0.028	194852	70284	61876
P. el. pallasii	P. el. elatior	P. grandis	0.170	39.308	0.000	0.077	201209	80111	56813
P. el. pallasii	P. el. leucophylla	P. grandis	0.058	13.393	0.000	0.026	193565	70232	62515
P. el. pallasii	P. el. lofthousei	P. el. elatior	0.024	4.271	0.000	0.008	255511	40373	38481
P. el. pallasii	P. el. meyeri	P. grandis	0.211	51.815	0.000	0.098	186153	83607	54424
P. el. pallasii	P. el. meyeri	P. grandis	0.213	48.064	0.000	0.099	186436	83011	53830
P. el. pallasii	P. el. pseudoelator	P. el. elatior	0.019	2.449	0.007	0.014	56895	88790	85539
P. el. pallasii	P. el. pseudoelator	P. el. meyeri	0.101	12.736	0.000	0.081	55684	89434	73016
P. el. pallasii	P. el. pseudoelator	P. juliae	0.116	13.874	0.000	0.065	52206	93779	74302
P. el. pallasii	P. el. pseudoelator	P. megaseifolia	0.015	1.831	0.034	0.012	59464	80890	78477
P. el. pallasii	P. el. pseudoelator	P. renifolia	0.109	12.088	0.000	0.077	56212	89803	72170
P. el. pallasii	P. el. pseudoelator	P. vu. heterochroma	0.130	19.058	0.000	0.096	53515	97484	75002
P. el. pallasii	P. juliae	P. grandis	0.052	12.293	0.000	0.023	198125	67721	61039
P. el. pallasii	P. megaseifolia	P. grandis	0.191	38.353	0.000	0.085	188136	79096	53735
P. el. pallasii	P. megaseifolia	P. ve. veris	0.167	25.038	0.000	0.084	115598	76143	54352
P. el. pallasii	P. renifolia	P. grandis	0.228	52.908	0.000	0.106	184951	85102	53486
P. el. pallasii	P. ve. columnnae	P. el. cordifolia	0.082	8.859	0.000	0.045	47188	100391	85169
P. el. pallasii	P. ve. columnnae	P. el. leucophylla	0.077	8.481	0.000	0.041	48070	100062	85736
P. el. pallasii	P. ve. columnnae	P. el. meyeri	0.033	3.198	0.001	0.030	50290	93087	87206
P. el. pallasii	P. ve. columnnae	P. vu. heterochroma	0.001	0.079	0.469	0.000	51147	93453	93342
P. el. pallasii	P. ve. columnnae	P. vu. sibthorpii GE	0.041	5.099	0.000	0.031	50763	96958	89241
P. el. pallasii	P. ve. columnnae	P. vu. sibthorpii TR	0.040	5.136	0.000	0.027	55826	97451	89982
P. el. pallasii	P. ve. columnnae	P. vu. vulgaris	0.055	6.649	0.000	0.032	61205	98465	88260
P. el. pallasii	P. ve. macrocalyx	P. el. cordifolia	0.088	8.897	0.000	0.049	46721	102064	85590
P. el. pallasii	P. ve. macrocalyx	P. el. leucophylla	0.081	8.546	0.000	0.043	47653	101396	86183
P. el. pallasii	P. ve. macrocalyx	P. el. meyeri	0.031	2.933	0.002	0.029	50209	93653	88033
P. el. pallasii	P. ve. macrocalyx	P. vu. sibthorpii GE	0.034	4.103	0.000	0.025	50944	96683	90347
P. el. pallasii	P. ve. macrocalyx	P. vu. sibthorpii TR	0.026	3.364	0.000	0.018	56256	96205	91335
P. el. pallasii	P. ve. macrocalyx	P. vu. vulgaris	0.046	5.548	0.000	0.027	61406	98036	89349
P. el. pallasii	P. ve. veris	P. el. pseudoelator	0.317	38.885	0.000	0.295	34619	148157	76856
P. el. pallasii	P. vu. heterochroma	P. grandis	0.030	7.265	0.000	0.013	201252	68134	64203



<b>P1</b>	<b>P2</b>	<b>P3</b>	<b>Dstatistic</b>	<b>Z-score</b>	<b>p-value</b>	<b>f4-ratio</b>	<b>BBA</b>	<b>ABBA</b>	<b>BABA</b>
P. el. pallasii	P. vu. sibthorpii GE	P. grandis	0.029	6.690	0.000	0.013	198648	69071	65137
P. el. pallasii	P. vu. sibthorpii TR	P. el. elatior	0.068	9.166	0.000	0.049	64717	91934	80192
P. el. pallasii	P. vu. vulgaris	P. el. elatior	0.063	8.878	0.000	0.048	62463	96750	85221
P. el. pallasii	P. vu. vulgaris	P. el. meyeri	0.070	10.522	0.000	0.056	64035	87200	75739
P. el. pallasii	P. vu. vulgaris	P. megaseifolia	0.019	2.960	0.002	0.016	65998	82380	79319
P. el. pseudoelatior	P. el. cordifolia	P. el. lofthousei	0.150	21.193	0.000	0.046	105358	65485	48393
P. el. pseudoelatior	P. el. cordifolia	P. el. pallasii	0.150	20.070	0.000	0.049	104349	67443	49851
P. el. pseudoelatior	P. el. cordifolia	P. grandis	0.131	16.271	0.000	0.048	224135	62352	47884
P. el. pseudoelatior	P. el. cordifolia	P. megaseifolia	0.122	13.160	0.000	0.075	84904	66135	51708
P. el. pseudoelatior	P. el. elatior	P. grandis	0.233	30.363	0.000	0.097	203944	79275	49311
P. el. pseudoelatior	P. el. elatior	P. vu. vulgaris	0.024	3.275	0.001	0.013	69582	78195	74523
P. el. pseudoelatior	P. el. leucophylla	P. el. lofthousei	0.146	20.585	0.000	0.045	105714	65828	49073
P. el. pseudoelatior	P. el. leucophylla	P. el. pallasii	0.146	19.569	0.000	0.048	104654	67790	50509
P. el. pseudoelatior	P. el. leucophylla	P. grandis	0.124	15.495	0.000	0.046	222739	62197	48433
P. el. pseudoelatior	P. el. leucophylla	P. megaseifolia	0.120	12.958	0.000	0.075	84842	66440	52215
P. el. pseudoelatior	P. el. lofthousei	P. grandis	0.024	3.003	0.001	0.012	184807	73026	69608
P. el. pseudoelatior	P. el. meyeri	P. el. lofthousei	0.122	16.552	0.000	0.038	95955	66854	52317
P. el. pseudoelatior	P. el. meyeri	P. el. pallasii	0.131	17.330	0.000	0.045	94617	70002	53765
P. el. pseudoelatior	P. el. meyeri	P. grandis	0.295	46.863	0.000	0.116	205709	78219	42615
P. el. pseudoelatior	P. el. meyeri	P. grandis	0.283	41.583	0.000	0.116	200102	79937	44686
P. el. pseudoelatior	P. el. pallasii	P. grandis	0.042	5.493	0.000	0.020	190673	75175	69052
P. el. pseudoelatior	P. juliae	P. grandis	0.108	13.581	0.000	0.042	214701	64474	51952
P. el. pseudoelatior	P. megaseifolia	P. el. meyeri	0.101	11.012	0.000	0.088	47115	81545	66577
P. el. pseudoelatior	P. megaseifolia	P. grandis	0.242	34.791	0.000	0.104	192908	81275	49644
P. el. pseudoelatior	P. renifolia	P. el. lofthousei	0.124	16.668	0.000	0.041	90858	69688	54311
P. el. pseudoelatior	P. renifolia	P. grandis	0.301	49.496	0.000	0.124	199647	81857	43977
P. el. pseudoelatior	P. ve. veris	P. ve. columnae	0.128	9.191	0.000	0.145	32918	99145	76595
P. el. pseudoelatior	P. ve. veris	P. ve. macrocalyx	0.240	20.743	0.000	0.319	35945	103498	63465
P. el. pseudoelatior	P. vu. heterochroma	P. el. meyeri	0.032	3.769	0.000	0.022	72702	66946	62771
P. el. pseudoelatior	P. vu. heterochroma	P. grandis	0.087	11.575	0.000	0.033	219751	63769	53528
P. el. pseudoelatior	P. vu. sibthorpii GE	P. el. lofthousei	0.145	21.276	0.000	0.046	102686	68425	51069
P. el. pseudoelatior	P. vu. sibthorpii GE	P. el. meyeri	0.042	5.261	0.000	0.028	75368	65797	60449
P. el. pseudoelatior	P. vu. sibthorpii GE	P. el. pallasii	0.145	20.829	0.000	0.050	101822	70868	52875
P. el. pseudoelatior	P. vu. sibthorpii GE	P. grandis	0.089	11.917	0.000	0.033	223251	62345	52198
P. el. pseudoelatior	P. vu. sibthorpii GE	P. renifolia	0.051	5.696	0.000	0.030	75512	66663	60202
P. el. pseudoelatior	P. vu. sibthorpii TR	P. el. lofthousei	0.107	14.863	0.000	0.035	102015	69532	56144
P. el. pseudoelatior	P. vu. sibthorpii TR	P. el. meyeri	0.003	0.335	0.369	0.002	69720	68190	67785
P. el. pseudoelatior	P. vu. sibthorpii TR	P. el. meyeri	0.005	0.530	0.298	0.003	74695	66414	65814
P. el. pseudoelatior	P. vu. sibthorpii TR	P. el. pallasii	0.102	14.182	0.000	0.036	101225	71445	58234
P. el. pseudoelatior	P. vu. sibthorpii TR	P. grandis	0.042	5.242	0.000	0.016	223270	62685	57670
P. el. pseudoelatior	P. vu. sibthorpii TR	P. megaseifolia	0.065	7.667	0.000	0.043	82270	69123	60738
P. el. pseudoelatior	P. vu. sibthorpii TR	P. renifolia	0.015	1.673	0.047	0.009	74590	67410	65381
P. el. pseudoelatior	P. vu. vulgaris	P. el. cordifolia	0.086	7.713	0.000	0.045	54353	86182	72534

<b>P1</b>	<b>P2</b>	<b>P3</b>	<b>Dstatistic</b>	<b>Z-score</b>	<b>p-value</b>	<b>f4-ratio</b>	<b>BBAA</b>	<b>ABBA</b>	<b>BABA</b>
P. el. pseudoelator	P. vu. vulgaris	P. el. leucophylla	0.079	7.117	0.000	0.039	55145	85222	72797
P. el. pseudoelator	P. vu. vulgaris	P. el. lothousei	0.065	7.949	0.000	0.022	101349	69930	61430
P. el. pseudoelator	P. vu. vulgaris	P. el. pallasii	0.045	5.444	0.000	0.017	101001	70310	64218
P. el. pseudoelator	P. vu. vulgaris	P. megaseifolia	0.007	0.768	0.221	0.005	82033	67697	66735
P. grandis	P. ve. columnae	P. el. meyeri	0.363	45.406	0.000	0.365	40402	204104	95299
P. grandis	P. ve. columnae	P. el. meyeri	0.349	46.060	0.000	0.334	42148	199599	96319
P. grandis	P. ve. columnae	P. megaseifolia	0.318	39.898	0.000	0.300	47971	190588	98651
P. grandis	P. ve. columnae	P. renifolia	0.333	42.907	0.000	0.299	41854	197935	99003
P. grandis	P. ve. macrocalyx	P. el. meyeri	0.361	44.271	0.000	0.363	40191	204883	96133
P. grandis	P. ve. macrocalyx	P. el. meyeri	0.346	45.403	0.000	0.332	42034	200122	97294
P. grandis	P. ve. macrocalyx	P. megaseifolia	0.314	39.251	0.000	0.297	47920	190890	99580
P. grandis	P. ve. macrocalyx	P. renifolia	0.331	41.932	0.000	0.297	41679	198554	99890
P. grandis	P. ve. veris	P. el. cordifolia	0.372	49.362	0.000	0.250	42918	214733	98344
P. grandis	P. ve. veris	P. el. elatior	0.269	33.944	0.000	0.234	43798	201249	116040
P. grandis	P. ve. veris	P. el. leucophylla	0.367	49.450	0.000	0.238	43724	212598	98379
P. grandis	P. ve. veris	P. el. meyeri	0.273	34.807	0.000	0.288	37719	201331	114966
P. grandis	P. ve. veris	P. el. meyeri	0.264	35.191	0.000	0.268	39170	198266	115365
P. grandis	P. ve. veris	P. el. pallasii	0.249	32.394	0.000	0.154	64233	185081	111397
P. grandis	P. ve. veris	P. juliae	0.348	47.940	0.000	0.245	47285	206704	100009
P. grandis	P. ve. veris	P. megaseifolia	0.229	29.419	0.000	0.227	45392	188200	118186
P. grandis	P. ve. veris	P. renifolia	0.244	31.664	0.000	0.230	39335	195428	118787
P. juliae	P. el. cordifolia	P. el. elatior	0.044	7.456	0.000	0.022	95334	57388	52545
P. juliae	P. el. cordifolia	P. el. meyeri	0.071	11.110	0.000	0.047	88518	58703	50971
P. juliae	P. el. cordifolia	P. el. meyeri	0.051	8.382	0.000	0.030	93481	56046	50571
P. juliae	P. el. cordifolia	P. el. pseudoelator	0.111	19.472	0.000	0.064	89632	62510	50013
P. juliae	P. el. cordifolia	P. grandis	0.018	3.930	0.000	0.006	237625	49722	47999
P. juliae	P. el. cordifolia	P. megaseifolia	0.033	5.121	0.000	0.019	99748	54016	50614
P. juliae	P. el. cordifolia	P. renifolia	0.053	8.729	0.000	0.028	93013	56646	50914
P. juliae	P. el. cordifolia	P. ve. columnae	0.119	19.186	0.000	0.052	108579	59951	47244
P. juliae	P. el. cordifolia	P. ve. macrocalyx	0.138	20.744	0.000	0.075	109267	61671	46699
P. juliae	P. el. cordifolia	P. ve. veris	0.114	17.002	0.000	0.052	128631	56183	44687
P. juliae	P. el. cordifolia	P. vu. heterochroma	0.065	8.823	0.000	0.043	74696	65260	57244
P. juliae	P. el. elatior	P. el. pallasii	0.040	5.485	0.000	0.017	83991	72694	67161
P. juliae	P. el. elatior	P. grandis	0.134	27.043	0.000	0.056	201189	69324	52891
P. juliae	P. el. leucophylla	P. el. elatior	0.040	6.731	0.000	0.020	96105	57151	52773
P. juliae	P. el. leucophylla	P. el. meyeri	0.069	10.606	0.000	0.047	89165	58646	51080
P. juliae	P. el. leucophylla	P. el. meyeri	0.049	7.769	0.000	0.029	94144	55971	50773
P. juliae	P. el. leucophylla	P. el. pseudoelator	0.107	18.994	0.000	0.063	90494	62296	50217
P. juliae	P. el. leucophylla	P. grandis	0.010	2.157	0.016	0.003	237004	49270	48309
P. juliae	P. el. leucophylla	P. megaseifolia	0.030	4.719	0.000	0.018	100424	53984	50861
P. juliae	P. el. leucophylla	P. renifolia	0.049	7.792	0.000	0.026	93784	56466	51216
P. juliae	P. el. leucophylla	P. ve. columnae	0.106	17.628	0.000	0.047	109709	59138	47808
P. juliae	P. el. leucophylla	P. ve. macrocalyx	0.123	19.750	0.000	0.066	110473	60568	47331

<b>P1</b>	<b>P2</b>	<b>P3</b>	<b>Dstatistic</b>	<b>Z-score</b>	<b>p-value</b>	<b>f4-ratio</b>	<b>BBA</b>	<b>ABBA</b>	<b>BABA</b>
P. juliae	P. el. leucophylla	P. ve. veris	0.100	15.703	0.000	0.046	129858	55431	45340
P. juliae	P. el. leucophylla	P. vu. heterochroma	0.064	8.670	0.000	0.042	75378	65092	57211
P. juliae	P. el. leucophylla	P. vu. vulgaris	0.093	12.137	0.000	0.044	83814	67230	55818
P. juliae	P. el. meyeri	P. grandis	0.191	41.430	0.000	0.077	199909	69612	47284
P. juliae	P. el. meyeri	P. grandis	0.185	36.889	0.000	0.078	195058	71101	48860
P. juliae	P. el. meyeri	P. ve. columnae	0.018	2.465	0.007	0.009	84719	62865	60672
P. juliae	P. el. meyeri	P. ve. macrocalyx	0.024	3.445	0.000	0.015	85628	63434	60456
P. juliae	P. el. meyeri	P. ve. veris	0.022	2.934	0.002	0.012	104123	59986	57365
P. juliae	P. megaseifolia	P. el. meyeri	0.080	12.247	0.000	0.068	51621	74387	63351
P. juliae	P. megaseifolia	P. grandis	0.152	29.501	0.000	0.064	192220	70110	51646
P. juliae	P. renifolia	P. grandis	0.205	42.090	0.000	0.086	195618	72416	47808
P. juliae	P. ve. veris	P. el. pseudoelator	0.153	14.604	0.000	0.148	36818	110247	81014
P. juliae	P. vu. heterochroma	P. el. elatior	0.001	0.115	0.454	0.000	85812	60516	60442
P. juliae	P. vu. heterochroma	P. el. pseudoelator	0.016	2.820	0.002	0.010	82011	61334	59452
P. juliae	P. vu. heterochroma	P. megaseifolia	0.010	1.806	0.035	0.006	88982	58216	57090
P. juliae	P. vu. heterochroma	P. ve. columnae	0.015	2.740	0.003	0.007	100821	58139	56459
P. juliae	P. vu. heterochroma	P. ve. macrocalyx	0.012	2.167	0.015	0.007	102171	57927	56572
P. juliae	P. vu. heterochroma	P. ve. veris	0.015	2.609	0.005	0.007	120876	55276	53663
P. juliae	P. vu. sibthorpii GE	P. el. elatior	0.012	2.215	0.013	0.006	86106	60520	59080
P. juliae	P. vu. sibthorpii GE	P. el. meyeri	0.012	2.325	0.010	0.009	80063	59636	58213
P. juliae	P. vu. sibthorpii GE	P. el. meyeri	0.005	0.903	0.183	0.003	84556	57747	57188
P. juliae	P. vu. sibthorpii GE	P. el. pseudoelator	0.057	9.906	0.000	0.035	80993	63711	56803
P. juliae	P. vu. sibthorpii GE	P. megaseifolia	0.016	2.809	0.002	0.010	89561	57831	56002
P. juliae	P. vu. sibthorpii GE	P. renifolia	0.002	0.407	0.342	0.001	84284	58031	57770
P. juliae	P. vu. sibthorpii GE	P. ve. columnae	0.050	8.747	0.000	0.023	99957	59737	54088
P. juliae	P. vu. sibthorpii GE	P. ve. macrocalyx	0.046	7.912	0.000	0.026	101237	59465	54192
P. juliae	P. vu. sibthorpii GE	P. ve. veris	0.052	8.505	0.000	0.026	119781	56887	51263
P. juliae	P. vu. sibthorpii TR	P. el. elatior	0.003	0.474	0.318	0.001	87055	63161	62826
P. juliae	P. vu. sibthorpii TR	P. el. pseudoelator	0.006	1.112	0.133	0.004	83165	62417	61615
P. juliae	P. vu. sibthorpii TR	P. ve. columnae	0.007	1.212	0.113	0.004	102402	59701	58813
P. juliae	P. vu. vulgaris	P. el. elatior	0.001	0.126	0.450	0.000	83601	68173	68063
P. juliae	P. vu. vulgaris	P. ve. veris	0.001	0.093	0.463	0.000	118598	60564	60483
P. megaseifolia	P. el. elatior	P. el. lothousei	0.112	13.571	0.000	0.040	90466	71518	57139
P. megaseifolia	P. el. elatior	P. el. pallasii	0.070	9.895	0.000	0.026	90511	69407	60376
P. megaseifolia	P. el. elatior	P. el. pseudoelator	0.086	17.940	0.000	0.047	82819	64958	54650
P. megaseifolia	P. el. elatior	P. juliae	0.056	10.213	0.000	0.023	74087	64563	57769
P. megaseifolia	P. el. elatior	P. ve. columnae	0.103	20.530	0.000	0.044	100472	63802	51893
P. megaseifolia	P. el. elatior	P. ve. macrocalyx	0.107	21.878	0.000	0.055	101375	64140	51784
P. megaseifolia	P. el. elatior	P. ve. veris	0.122	24.587	0.000	0.056	120351	62599	49024
P. megaseifolia	P. el. elatior	P. vu. heterochroma	0.046	8.987	0.000	0.026	75454	65795	59999
P. megaseifolia	P. el. elatior	P. vu. sibthorpii GE	0.051	10.064	0.000	0.028	74491	66252	59785
P. megaseifolia	P. el. meyeri	P. el. cordifolia	0.071	14.113	0.000	0.026	72061	61326	53196
P. megaseifolia	P. el. meyeri	P. el. leucophylla	0.071	14.007	0.000	0.025	72265	61374	53275

<b>P1</b>	<b>P2</b>	<b>P3</b>	<b>Dstatistic</b>	<b>Z-score</b>	<b>p-value</b>	<b>f4-ratio</b>	<b>BBAA</b>	<b>ABBA</b>	<b>BABA</b>
P. megaseifolia	P. el. meyeri	P. el. pseudoelator	0.112	21.717	0.000	0.057	83146	62061	49608
P. megaseifolia	P. el. meyeri	P. grandis	0.034	7.900	0.000	0.014	199290	56881	53165
P. megaseifolia	P. el. meyeri	P. grandis	0.035	8.457	0.000	0.014	198121	56958	53072
P. megaseifolia	P. el. meyeri	P. juliae	0.053	10.058	0.000	0.021	75792	59626	53640
P. megaseifolia	P. el. meyeri	P. ve. columnae	0.189	33.998	0.000	0.078	99019	65229	44538
P. megaseifolia	P. el. meyeri	P. ve. columnae	0.139	25.559	0.000	0.057	99954	61876	46775
P. megaseifolia	P. el. meyeri	P. ve. macrocalyx	0.194	37.184	0.000	0.096	99803	65653	44325
P. megaseifolia	P. el. meyeri	P. ve. macrocalyx	0.141	26.375	0.000	0.070	100961	62078	46760
P. megaseifolia	P. el. meyeri	P. ve. veris	0.195	33.909	0.000	0.085	119047	62524	42127
P. megaseifolia	P. el. meyeri	P. ve. veris	0.158	27.726	0.000	0.069	119349	60586	44030
P. megaseifolia	P. el. meyeri	P. vu. heterochroma	0.083	15.318	0.000	0.044	75824	63666	53914
P. megaseifolia	P. el. meyeri	P. vu. heterochroma	0.036	6.850	0.000	0.019	77092	60014	55829
P. megaseifolia	P. el. meyeri	P. vu. sibthorpii GE	0.041	7.370	0.000	0.021	76082	60323	55579
P. megaseifolia	P. el. meyeri	P. vu. sibthorpii TR	0.096	17.020	0.000	0.044	80081	65208	53753
P. megaseifolia	P. el. meyeri	P. vu. sibthorpii TR	0.041	7.528	0.000	0.019	81699	60891	56056
P. megaseifolia	P. el. meyeri	P. vu. vulgaris	0.119	21.471	0.000	0.047	85899	66138	52093
P. megaseifolia	P. el. meyeri	P. vu. vulgaris	0.059	10.719	0.000	0.023	87610	61339	54531
P. megaseifolia	P. el. pseudoelator	P. juliae	0.066	7.981	0.000	0.033	57248	77606	68058
P. megaseifolia	P. el. pseudoelator	P. vu. heterochroma	0.067	9.514	0.000	0.045	57236	79771	69736
P. megaseifolia	P. el. pseudoelator	P. vu. sibthorpii GE	0.095	12.125	0.000	0.062	55317	82831	68432
P. megaseifolia	P. juliae	P. el. lofthousei	0.033	5.127	0.000	0.012	79269	66537	62229
P. megaseifolia	P. juliae	P. el. pallasii	0.027	4.477	0.000	0.011	78294	68334	64759
P. megaseifolia	P. juliae	P. ve. veris	0.143	22.149	0.000	0.074	104506	70025	52546
P. megaseifolia	P. renifolia	P. el. leucophylla	0.082	16.477	0.000	0.028	73002	61715	52374
P. megaseifolia	P. renifolia	P. el. pseudoelator	0.110	21.222	0.000	0.056	84515	61480	49275
P. megaseifolia	P. renifolia	P. grandis	0.057	13.220	0.000	0.023	198863	58076	51814
P. megaseifolia	P. renifolia	P. juliae	0.063	11.170	0.000	0.024	76537	59989	52865
P. megaseifolia	P. renifolia	P. ve. columnae	0.124	22.010	0.000	0.050	102056	60048	46821
P. megaseifolia	P. renifolia	P. ve. macrocalyx	0.127	23.761	0.000	0.062	102948	60347	46701
P. megaseifolia	P. renifolia	P. ve. veris	0.128	22.290	0.000	0.055	122183	57637	44556
P. megaseifolia	P. renifolia	P. vu. heterochroma	0.042	7.916	0.000	0.022	78085	60057	55210
P. megaseifolia	P. renifolia	P. vu. sibthorpii GE	0.048	8.529	0.000	0.024	76987	60457	54890
P. megaseifolia	P. renifolia	P. vu. sibthorpii TR	0.051	9.284	0.000	0.023	82406	61093	55138
P. megaseifolia	P. renifolia	P. vu. vulgaris	0.068	12.623	0.000	0.026	88441	61485	53678
P. megaseifolia	P. ve. veris	P. el. pseudoelator	0.245	26.232	0.000	0.226	34851	126713	76897
P. megaseifolia	P. vu. heterochroma	P. el. lofthousei	0.019	3.050	0.001	0.007	82495	66620	64132
P. megaseifolia	P. vu. heterochroma	P. el. pallasii	0.017	2.902	0.002	0.007	81465	69015	66660
P. megaseifolia	P. vu. heterochroma	P. ve. veris	0.155	25.035	0.000	0.080	107585	71958	52625
P. megaseifolia	P. vu. sibthorpii TR	P. ve. veris	0.135	21.817	0.000	0.073	107591	73965	56340
P. megaseifolia	P. vu. vulgaris	P. ve. veris	0.129	18.393	0.000	0.074	104367	78320	60473
P. renifolia	P. el. cordifolia	P. el. lofthousei	0.016	2.930	0.002	0.005	90570	59829	57929
P. renifolia	P. el. cordifolia	P. el. pallasii	0.015	2.677	0.004	0.005	89449	61721	59937
P. renifolia	P. el. cordifolia	P. ve. veris	0.138	21.183	0.000	0.072	103908	66899	50710

<b>P1</b>	<b>P2</b>	<b>P3</b>	<b>Dstatistic</b>	<b>Z-score</b>	<b>p-value</b>	<b>f4-ratio</b>	<b>BBAA</b>	<b>ABBA</b>	<b>BABA</b>
P. renifolia	P. el. elatior	P. el. lofthousei	0.160	17.488	0.000	0.048	118612	63305	45859
P. renifolia	P. el. elatior	P. el. meyeri	0.035	3.911	0.000	0.037	53511	64992	60581
P. renifolia	P. el. elatior	P. el. pallasii	0.112	15.274	0.000	0.035	119089	60779	48520
P. renifolia	P. el. elatior	P. ve. veris	0.005	0.799	0.212	0.002	142881	47060	46638
P. renifolia	P. el. elatior	P. vu. heterochroma	0.009	1.989	0.023	0.004	99894	52718	51762
P. renifolia	P. el. elatior	P. vu. sibthorpii GE	0.009	1.715	0.043	0.004	98428	52753	51843
P. renifolia	P. el. elatior	P. vu. sibthorpii TR	0.041	9.278	0.000	0.017	103181	55976	51525
P. renifolia	P. el. elatior	P. vu. vulgaris	0.090	20.114	0.000	0.034	107751	60261	50338
P. renifolia	P. el. leucophylla	P. el. lofthousei	0.012	2.168	0.015	0.004	90836	59983	58593
P. renifolia	P. el. leucophylla	P. el. pallasii	0.011	1.978	0.024	0.004	89683	61906	60602
P. renifolia	P. el. leucophylla	P. ve. veris	0.125	19.469	0.000	0.065	104289	66269	51549
P. renifolia	P. el. meyeri	P. el. cordifolia	0.069	14.741	0.000	0.021	91873	51054	44501
P. renifolia	P. el. meyeri	P. el. leucophylla	0.071	15.023	0.000	0.021	91836	51201	44391
P. renifolia	P. el. meyeri	P. el. lofthousei	0.025	4.432	0.000	0.005	164841	38237	36338
P. renifolia	P. el. meyeri	P. el. pallasii	0.002	0.403	0.343	0.000	122984	45979	45823
P. renifolia	P. el. meyeri	P. el. pallasii	0.021	3.625	0.000	0.005	165729	39414	37809
P. renifolia	P. el. meyeri	P. el. pseudoelatior	0.077	15.564	0.000	0.035	102819	50242	43041
P. renifolia	P. el. meyeri	P. el. pseudoelatior	0.004	0.788	0.215	0.001	148661	38237	37941
P. renifolia	P. el. meyeri	P. juliae	0.050	10.366	0.000	0.016	97363	49186	44512
P. renifolia	P. el. meyeri	P. ve. columnae	0.083	17.014	0.000	0.029	120334	48646	41206
P. renifolia	P. el. meyeri	P. ve. columnae	0.026	4.608	0.000	0.008	166077	38048	36095
P. renifolia	P. el. meyeri	P. ve. macrocalyx	0.085	18.448	0.000	0.037	121088	48866	41219
P. renifolia	P. el. meyeri	P. ve. macrocalyx	0.024	4.238	0.000	0.008	167253	38082	36321
P. renifolia	P. el. meyeri	P. ve. veris	0.085	16.740	0.000	0.032	141155	46389	39099
P. renifolia	P. el. meyeri	P. ve. veris	0.050	8.466	0.000	0.016	186830	37511	33959
P. renifolia	P. el. meyeri	P. vu. heterochroma	0.052	11.247	0.000	0.023	99944	50139	45181
P. renifolia	P. el. meyeri	P. vu. sibthorpii GE	0.061	12.331	0.000	0.026	98122	50738	44888
P. renifolia	P. el. meyeri	P. vu. sibthorpii TR	0.058	12.390	0.000	0.022	103737	50973	45427
P. renifolia	P. el. meyeri	P. vu. vulgaris	0.065	14.048	0.000	0.021	109053	51345	45044
P. renifolia	P. el. pseudoelatior	P. el. cordifolia	0.064	7.160	0.000	0.030	55133	76119	66989
P. renifolia	P. el. pseudoelatior	P. el. leucophylla	0.063	7.085	0.000	0.028	55680	76125	67119
P. renifolia	P. el. pseudoelatior	P. juliae	0.018	2.128	0.017	0.009	61729	70064	67602
P. renifolia	P. el. pseudoelatior	P. vu. heterochroma	0.037	4.616	0.000	0.024	62609	72893	67743
P. renifolia	P. juliae	P. el. lofthousei	0.058	10.028	0.000	0.020	85132	65391	58232
P. renifolia	P. juliae	P. el. pallasii	0.051	9.534	0.000	0.019	84133	67094	60545
P. renifolia	P. juliae	P. ve. columnae	0.041	6.018	0.000	0.021	84640	65390	60236
P. renifolia	P. juliae	P. ve. macrocalyx	0.037	5.471	0.000	0.022	85576	65211	60599
P. renifolia	P. juliae	P. ve. veris	0.039	5.275	0.000	0.021	103929	62049	57444
P. renifolia	P. megaseifolia	P. el. lofthousei	0.027	5.170	0.000	0.008	96075	55506	52565
P. renifolia	P. megaseifolia	P. el. pallasii	0.028	5.311	0.000	0.009	95145	57639	54545
P. renifolia	P. ve. veris	P. el. pseudoelatior	0.192	18.995	0.000	0.179	36832	115693	78449
P. renifolia	P. vu. heterochroma	P. el. lofthousei	0.043	7.395	0.000	0.015	86716	66031	60615
P. renifolia	P. vu. heterochroma	P. el. pallasii	0.041	7.127	0.000	0.016	85725	68416	62992

<b>P1</b>	<b>P2</b>	<b>P3</b>	<b>Dstatistic</b>	<b>Z-score</b>	<b>p-value</b>	<b>f4-ratio</b>	<b>BBAA</b>	<b>ABBA</b>	<b>BABA</b>
P. renifolia	P. vu. heterochroma	P. ve. columnae	0.053	7.447	0.000	0.027	85264	67895	61010
P. renifolia	P. vu. heterochroma	P. ve. macrocalyx	0.047	6.722	0.000	0.029	86322	67485	61468
P. renifolia	P. vu. heterochroma	P. ve. veris	0.051	6.864	0.000	0.028	105170	64454	58186
P. renifolia	P. vu. sibthorpii GE	P. el. lofthousei	0.016	2.840	0.002	0.005	88509	63026	61081
P. renifolia	P. vu. sibthorpii GE	P. el. pallasii	0.016	2.821	0.002	0.006	87448	65351	63351
P. renifolia	P. vu. sibthorpii GE	P. ve. columnae	0.085	12.732	0.000	0.043	84253	69670	58810
P. renifolia	P. vu. sibthorpii GE	P. ve. macrocalyx	0.078	12.123	0.000	0.048	85261	69202	59241
P. renifolia	P. vu. sibthorpii GE	P. ve. veris	0.084	12.372	0.000	0.045	103954	66208	55928
P. renifolia	P. vu. sibthorpii TR	P. ve. columnae	0.045	6.630	0.000	0.024	85259	69949	63893
P. renifolia	P. vu. sibthorpii TR	P. ve. macrocalyx	0.030	4.582	0.000	0.019	86538	68516	64567
P. renifolia	P. vu. sibthorpii TR	P. ve. veris	0.036	5.163	0.000	0.020	105612	65765	61256
P. renifolia	P. vu. vulgaris	P. el. pseudoelator	0.020	2.924	0.002	0.014	67290	73813	70870
P. renifolia	P. vu. vulgaris	P. ve. columnae	0.012	1.593	0.056	0.006	84575	70409	68768
P. renifolia	P. vu. vulgaris	P. ve. macrocalyx	0.004	0.576	0.282	0.003	85603	69787	69221
P. renifolia	P. vu. vulgaris	P. ve. veris	0.035	4.633	0.000	0.021	103742	69614	64917
P. ve. columnae	P. el. cordifolia	P. grandis	0.268	29.263	0.000	0.103	219404	79284	45818
P. ve. columnae	P. el. elatior	P. el. cordifolia	0.075	7.159	0.000	0.037	54570	86270	74183
P. ve. columnae	P. el. elatior	P. el. leucophylla	0.081	8.049	0.000	0.038	55334	86569	73533
P. ve. columnae	P. el. elatior	P. grandis	0.346	40.789	0.000	0.150	202482	96507	46932
P. ve. columnae	P. el. leucophylla	P. grandis	0.260	28.542	0.000	0.102	217312	79326	46616
P. ve. columnae	P. el. lofthousei	P. el. elatior	0.087	10.908	0.000	0.067	51576	104172	87528
P. ve. columnae	P. el. lofthousei	P. grandis	0.140	15.513	0.000	0.070	182572	89531	67607
P. ve. columnae	P. el. lofthousei	P. megaseifolia	0.076	7.887	0.000	0.063	55542	92677	79655
P. ve. columnae	P. el. meyeri	P. el. cordifolia	0.072	7.117	0.000	0.034	55099	82110	71058
P. ve. columnae	P. el. meyeri	P. el. leucophylla	0.080	8.174	0.000	0.036	55837	82629	70418
P. ve. columnae	P. el. pallasii	P. el. elatior	0.081	10.016	0.000	0.061	53484	103137	87658
P. ve. columnae	P. el. pallasii	P. el. meyeri	0.003	0.329	0.371	0.003	51933	89528	89015
P. ve. columnae	P. el. pallasii	P. grandis	0.158	18.046	0.000	0.077	187458	92318	67193
P. ve. columnae	P. el. pallasii	P. juliae	0.011	1.276	0.101	0.007	49831	91930	89950
P. ve. columnae	P. el. pallasii	P. megaseifolia	0.099	10.790	0.000	0.081	56653	96148	78787
P. ve. columnae	P. el. pallasii	P. renifolia	0.007	0.700	0.242	0.005	52829	89416	88168
P. ve. columnae	P. el. pseudoelator	P. el. cordifolia	0.211	24.297	0.000	0.068	121775	62704	40862
P. ve. columnae	P. el. pseudoelator	P. el. elatior	0.194	24.837	0.000	0.073	140973	57991	39181
P. ve. columnae	P. el. pseudoelator	P. el. leucophylla	0.219	25.341	0.000	0.067	122156	63131	40426
P. ve. columnae	P. el. pseudoelator	P. el. lofthousei	0.212	28.364	0.000	0.047	169551	53884	35045
P. ve. columnae	P. el. pseudoelator	P. el. meyeri	0.194	24.651	0.000	0.099	131306	58025	39201
P. ve. columnae	P. el. pseudoelator	P. el. meyeri	0.179	24.292	0.000	0.082	135874	55997	38992
P. ve. columnae	P. el. pseudoelator	P. el. pallasii	0.223	31.231	0.000	0.054	170288	56206	35743
P. ve. columnae	P. el. pseudoelator	P. grandis	0.216	30.378	0.000	0.058	290291	53581	34547
P. ve. columnae	P. el. pseudoelator	P. juliae	0.220	29.947	0.000	0.071	131347	59750	38201
P. ve. columnae	P. el. pseudoelator	P. megaseifolia	0.215	28.493	0.000	0.092	148708	56021	36218
P. ve. columnae	P. el. pseudoelator	P. renifolia	0.199	25.181	0.000	0.081	137539	57130	38166
P. ve. columnae	P. el. pseudoelator	P. vu. heterochroma	0.224	30.552	0.000	0.095	131733	61428	38984

<b>P1</b>	<b>P2</b>	<b>P3</b>	<b>Dstatistic</b>	<b>Z-score</b>	<b>p-value</b>	<b>f4-ratio</b>	<b>BBAA</b>	<b>ABBA</b>	<b>BABA</b>
P. ve. columnnae	P. el. pseudoelator	P. vu. sibthorpii GE	0.229	32.227	0.000	0.096	127846	62700	39314
P. ve. columnnae	P. el. pseudoelator	P. vu. sibthorpii TR	0.218	28.048	0.000	0.083	134309	62624	40208
P. ve. columnnae	P. el. pseudoelator	P. vu. vulgaris	0.202	25.550	0.000	0.067	139251	61217	40625
P. ve. columnnae	P. juliae	P. grandis	0.236	26.032	0.000	0.097	210103	81242	50178
P. ve. columnnae	P. megaseifolia	P. el. cordifolia	0.018	1.815	0.035	0.009	49531	83761	80748
P. ve. columnnae	P. megaseifolia	P. el. leucophylla	0.026	2.656	0.004	0.013	50327	84273	80014
P. ve. columnnae	P. megaseifolia	P. juliae	0.075	8.910	0.000	0.039	55249	85428	73440
P. ve. columnnae	P. megaseifolia	P. vu. heterochroma	0.076	9.768	0.000	0.053	55263	87828	75367
P. ve. columnnae	P. megaseifolia	P. vu. sibthorpii GE	0.055	6.599	0.000	0.037	53560	86567	77617
P. ve. columnnae	P. megaseifolia	P. vu. sibthorpii TR	0.056	6.746	0.000	0.035	58864	87495	78215
P. ve. columnnae	P. megaseifolia	P. vu. vulgaris	0.038	4.431	0.000	0.020	64179	85439	79151
P. ve. columnnae	P. renifolia	P. el. cordifolia	0.082	8.199	0.000	0.040	53425	84202	71405
P. ve. columnnae	P. renifolia	P. el. leucophylla	0.089	9.106	0.000	0.041	54227	84545	70774
P. ve. columnnae	P. ve. macrocalyx	P. el. cordifolia	0.019	2.919	0.002	0.004	185185	36042	34718
P. ve. columnnae	P. ve. macrocalyx	P. el. leucophylla	0.014	2.164	0.015	0.003	185718	35785	34819
P. ve. columnnae	P. ve. macrocalyx	P. ve. veris	0.013	1.308	0.095	0.014	92057	45993	44821
P. ve. columnnae	P. vu. heterochroma	P. grandis	0.222	24.934	0.000	0.090	214844	81100	51653
P. ve. columnnae	P. vu. sibthorpii GE	P. grandis	0.225	25.490	0.000	0.089	217447	79659	50444
P. ve. columnnae	P. vu. sibthorpii TR	P. grandis	0.179	19.115	0.000	0.074	218670	80229	55811
P. ve. columnnae	P. vu. vulgaris	P. grandis	0.129	12.306	0.000	0.054	219468	78859	60888
P. ve. macrocalyx	P. el. cordifolia	P. grandis	0.275	29.183	0.000	0.105	221465	79763	45376
P. ve. macrocalyx	P. el. elatior	P. el. cordifolia	0.067	5.861	0.000	0.033	54440	86682	75770
P. ve. macrocalyx	P. el. elatior	P. el. leucophylla	0.076	6.991	0.000	0.036	55268	87050	74828
P. ve. macrocalyx	P. el. elatior	P. grandis	0.351	40.478	0.000	0.152	203231	97466	46839
P. ve. macrocalyx	P. el. leucophylla	P. grandis	0.267	28.422	0.000	0.105	219033	79828	46196
P. ve. macrocalyx	P. el. lofthousei	P. el. elatior	0.089	10.884	0.000	0.069	51626	105101	87952
P. ve. macrocalyx	P. el. lofthousei	P. grandis	0.145	15.500	0.000	0.073	183033	90453	67592
P. ve. macrocalyx	P. el. lofthousei	P. megaseifolia	0.080	8.141	0.000	0.066	55731	93603	79752
P. ve. macrocalyx	P. el. meyeri	P. el. cordifolia	0.063	5.725	0.000	0.031	54800	82553	72704
P. ve. macrocalyx	P. el. meyeri	P. el. leucophylla	0.073	7.066	0.000	0.034	55600	83123	71749
P. ve. macrocalyx	P. el. pallasii	P. el. elatior	0.083	10.048	0.000	0.062	53469	104138	88111
P. ve. macrocalyx	P. el. pallasii	P. el. meyeri	0.007	0.735	0.231	0.006	51997	90530	89353
P. ve. macrocalyx	P. el. pallasii	P. grandis	0.163	17.970	0.000	0.080	187889	93331	67224
P. ve. macrocalyx	P. el. pallasii	P. juliae	0.017	1.899	0.029	0.010	49977	93004	89978
P. ve. macrocalyx	P. el. pallasii	P. megaseifolia	0.104	11.034	0.000	0.085	56793	97198	78950
P. ve. macrocalyx	P. el. pallasii	P. renifolia	0.010	0.942	0.173	0.007	52848	90357	88629
P. ve. macrocalyx	P. el. pallasii	P. vu. heterochroma	0.007	0.914	0.180	0.005	51332	94503	93219
P. ve. macrocalyx	P. el. pseudoelator	P. el. cordifolia	0.186	19.384	0.000	0.064	108759	65598	44995
P. ve. macrocalyx	P. el. pseudoelator	P. el. elatior	0.188	23.879	0.000	0.075	127889	61087	41789
P. ve. macrocalyx	P. el. pseudoelator	P. el. leucophylla	0.198	21.512	0.000	0.064	109446	66127	44296
P. ve. macrocalyx	P. el. pseudoelator	P. el. lofthousei	0.208	28.353	0.000	0.049	156954	56666	37188
P. ve. macrocalyx	P. el. pseudoelator	P. el. meyeri	0.186	23.390	0.000	0.100	118259	61018	41903
P. ve. macrocalyx	P. el. pseudoelator	P. el. meyeri	0.176	24.728	0.000	0.085	122970	59017	41324

<b>P1</b>	<b>P2</b>	<b>P3</b>	<b>Dstatistic</b>	<b>Z-score</b>	<b>p-value</b>	<b>f4-ratio</b>	<b>BBAA</b>	<b>ABBA</b>	<b>BABA</b>
P. ve. macrocalyx	P. el. pseudoelator	P. el. pallasii	0.219	31.079	0.000	0.055	157358	59122	37859
P. ve. macrocalyx	P. el. pseudoelator	P. grandis	0.214	29.497	0.000	0.061	277475	56474	36545
P. ve. macrocalyx	P. el. pseudoelator	P. juliae	0.218	28.967	0.000	0.074	118885	63150	40511
P. ve. macrocalyx	P. el. pseudoelator	P. megaseifolia	0.212	28.364	0.000	0.096	135770	58992	38342
P. ve. macrocalyx	P. el. pseudoelator	P. renifolia	0.194	24.632	0.000	0.083	124465	60100	40600
P. ve. macrocalyx	P. el. pseudoelator	P. vu. heterochroma	0.225	30.982	0.000	0.100	119203	64988	41137
P. ve. macrocalyx	P. el. pseudoelator	P. vu. sibthorpii GE	0.230	32.819	0.000	0.101	115373	66263	41440
P. ve. macrocalyx	P. el. pseudoelator	P. vu. sibthorpii TR	0.233	33.879	0.000	0.092	121946	66424	41355
P. ve. macrocalyx	P. el. pseudoelator	P. vu. vulgaris	0.207	26.981	0.000	0.071	126553	64693	42501
P. ve. macrocalyx	P. juliae	P. grandis	0.242	25.603	0.000	0.099	210392	82253	50218
P. ve. macrocalyx	P. megaseifolia	P. el. cordifolia	0.011	0.989	0.161	0.006	49063	84202	82400
P. ve. macrocalyx	P. megaseifolia	P. el. leucophylla	0.020	1.975	0.024	0.010	49911	84777	81377
P. ve. macrocalyx	P. megaseifolia	P. juliae	0.082	9.421	0.000	0.043	55325	86456	73357
P. ve. macrocalyx	P. megaseifolia	P. vu. heterochroma	0.085	10.614	0.000	0.058	55419	88951	75075
P. ve. macrocalyx	P. megaseifolia	P. vu. sibthorpii GE	0.063	7.481	0.000	0.042	53682	87635	77254
P. ve. macrocalyx	P. megaseifolia	P. vu. sibthorpii TR	0.072	8.802	0.000	0.044	59268	88863	76932
P. ve. macrocalyx	P. megaseifolia	P. vu. vulgaris	0.048	5.441	0.000	0.025	64381	86560	78692
P. ve. macrocalyx	P. renifolia	P. el. cordifolia	0.074	6.754	0.000	0.036	53193	84521	72913
P. ve. macrocalyx	P. renifolia	P. el. leucophylla	0.082	8.002	0.000	0.038	54067	84946	72001
P. ve. macrocalyx	P. ve. columnae	P. el. elatior	0.006	1.024	0.153	0.002	205763	33553	33153
P. ve. macrocalyx	P. ve. columnae	P. el. lofthousei	0.009	1.582	0.057	0.001	233754	30812	30249
P. ve. macrocalyx	P. ve. columnae	P. el. meyeri	0.003	0.499	0.309	0.001	195394	33315	33121
P. ve. macrocalyx	P. ve. columnae	P. el. meyeri	0.009	1.708	0.044	0.003	199103	32789	32181
P. ve. macrocalyx	P. ve. columnae	P. el. pallasii	0.011	1.990	0.023	0.002	236308	31896	31179
P. ve. macrocalyx	P. ve. columnae	P. el. pseudoelator	0.176	16.500	0.000	0.112	123703	54463	38184
P. ve. macrocalyx	P. ve. columnae	P. grandis	0.013	2.435	0.007	0.002	357116	30684	29878
P. ve. macrocalyx	P. ve. columnae	P. juliae	0.015	2.402	0.008	0.003	195882	33655	32660
P. ve. macrocalyx	P. ve. columnae	P. megaseifolia	0.012	2.057	0.020	0.004	214183	31915	31142
P. ve. macrocalyx	P. ve. columnae	P. renifolia	0.007	1.120	0.131	0.002	202001	32774	32351
P. ve. macrocalyx	P. ve. columnae	P. vu. heterochroma	0.019	3.220	0.001	0.005	197326	34550	33243
P. ve. macrocalyx	P. ve. columnae	P. vu. sibthorpii GE	0.019	3.121	0.001	0.005	193360	34937	33611
P. ve. macrocalyx	P. ve. columnae	P. vu. sibthorpii TR	0.037	5.608	0.000	0.009	200564	36080	33521
P. ve. macrocalyx	P. ve. columnae	P. vu. vulgaris	0.021	3.658	0.000	0.005	204457	35322	33835
P. ve. macrocalyx	P. vu. heterochroma	P. grandis	0.227	24.455	0.000	0.092	214830	82139	51702
P. ve. macrocalyx	P. vu. sibthorpii GE	P. grandis	0.230	25.126	0.000	0.092	217376	80626	50459
P. ve. macrocalyx	P. vu. sibthorpii TR	P. grandis	0.185	18.955	0.000	0.076	217639	81480	56084
P. ve. macrocalyx	P. vu. vulgaris	P. grandis	0.134	12.408	0.000	0.057	219321	79886	60996
P. ve. veris	P. el. lofthousei	P. el. cordifolia	0.024	2.712	0.003	0.014	45433	100715	95981
P. ve. veris	P. el. lofthousei	P. el. elatior	0.178	23.512	0.000	0.138	49851	122551	85444
P. ve. veris	P. el. lofthousei	P. el. leucophylla	0.029	3.287	0.001	0.016	46311	101295	95661
P. ve. veris	P. el. lofthousei	P. el. meyeri	0.058	5.722	0.000	0.054	48511	101737	90641
P. ve. veris	P. el. lofthousei	P. el. meyeri	0.087	10.174	0.000	0.076	49322	104431	87660
P. ve. veris	P. el. lofthousei	P. grandis	0.252	29.422	0.000	0.129	181513	107758	64382



<b>P1</b>	<b>P2</b>	<b>P3</b>	<b>Dstatistic</b>	<b>Z-score</b>	<b>p-value</b>	<b>f4-ratio</b>	<b>BBAA</b>	<b>ABBA</b>	<b>BABA</b>
P. ve. veris	P. el. lofthousei	P. juliae	0.106	12.405	0.000	0.065	47753	107441	86803
P. ve. veris	P. el. lofthousei	P. renifolia	0.100	10.208	0.000	0.077	50788	104780	85803
P. ve. veris	P. el. lofthousei	P. vu. heterochroma	0.093	12.651	0.000	0.073	49048	108745	90290
P. ve. veris	P. el. lofthousei	P. vu. sibthorpii GE	0.054	6.745	0.000	0.041	48617	104387	93705
P. ve. veris	P. el. lofthousei	P. vu. sibthorpii TR	0.064	8.384	0.000	0.045	53639	106190	93347
P. ve. veris	P. el. lofthousei	P. vu. vulgaris	0.038	4.536	0.000	0.024	57140	104854	97201
P. ve. veris	P. el. pallasii	P. el. cordifolia	0.044	5.103	0.000	0.025	44756	104363	95650
P. ve. veris	P. el. pallasii	P. el. elatior	0.175	22.289	0.000	0.132	50435	122448	85949
P. ve. veris	P. el. pallasii	P. el. leucophylla	0.048	5.768	0.000	0.027	45634	104960	95302
P. ve. veris	P. el. pallasii	P. el. meyeri	0.085	8.825	0.000	0.079	47740	106581	89907
P. ve. veris	P. el. pallasii	P. el. meyeri	0.107	12.810	0.000	0.093	49069	108284	87319
P. ve. veris	P. el. pallasii	P. juliae	0.124	15.308	0.000	0.074	47495	110917	86519
P. ve. veris	P. el. pallasii	P. renifolia	0.122	12.728	0.000	0.093	50454	108921	85318
P. ve. veris	P. el. pallasii	P. vu. heterochroma	0.113	16.042	0.000	0.089	48777	112969	89963
P. ve. veris	P. el. pallasii	P. vu. sibthorpii GE	0.075	9.824	0.000	0.057	48342	108624	93436
P. ve. veris	P. el. pallasii	P. vu. sibthorpii TR	0.083	11.451	0.000	0.057	53550	109883	93110
P. ve. veris	P. el. pallasii	P. vu. vulgaris	0.046	5.588	0.000	0.029	57670	106923	97475
P. ve. veris	P. el. pseudoelatior	P. grandis	0.386	51.135	0.000	0.117	267969	73990	32802
P. ve. veris	P. megaseifolia	P. el. cordifolia	0.151	16.354	0.000	0.078	46879	103193	76119
P. ve. veris	P. megaseifolia	P. el. leucophylla	0.158	17.740	0.000	0.078	47685	103719	75379
P. ve. veris	P. megaseifolia	P. vu. sibthorpii GE	0.177	22.672	0.000	0.120	50850	106080	74138
P. ve. veris	P. ve. columnae	P. el. cordifolia	0.288	38.074	0.000	0.069	158283	54027	29851
P. ve. veris	P. ve. columnae	P. el. elatior	0.259	33.700	0.000	0.076	176592	51578	30385
P. ve. veris	P. ve. columnae	P. el. leucophylla	0.289	37.463	0.000	0.066	159213	54030	29819
P. ve. veris	P. ve. columnae	P. el. lofthousei	0.258	29.498	0.000	0.046	205939	47539	28037
P. ve. veris	P. ve. columnae	P. el. meyeri	0.282	39.087	0.000	0.106	167381	51913	29091
P. ve. veris	P. ve. columnae	P. el. meyeri	0.260	34.826	0.000	0.091	170358	50271	29533
P. ve. veris	P. ve. columnae	P. el. pallasii	0.282	35.001	0.000	0.053	207641	49520	27749
P. ve. veris	P. ve. columnae	P. grandis	0.298	39.969	0.000	0.063	328107	48216	26053
P. ve. veris	P. ve. columnae	P. juliae	0.282	37.413	0.000	0.068	168127	51520	28884
P. ve. veris	P. ve. columnae	P. megaseifolia	0.288	41.343	0.000	0.093	185615	49676	27448
P. ve. veris	P. ve. columnae	P. renifolia	0.284	37.940	0.000	0.088	173797	51132	28491
P. ve. veris	P. ve. columnae	P. vu. heterochroma	0.283	37.403	0.000	0.089	169002	52938	29603
P. ve. veris	P. ve. columnae	P. vu. sibthorpii GE	0.278	36.753	0.000	0.086	165139	53247	30096
P. ve. veris	P. ve. columnae	P. vu. sibthorpii TR	0.288	38.777	0.000	0.083	172136	54758	30239
P. ve. veris	P. ve. columnae	P. vu. vulgaris	0.232	28.180	0.000	0.060	174799	52865	32942
P. ve. veris	P. ve. macrocalyx	P. el. cordifolia	0.305	38.349	0.000	0.073	159307	54962	29259
P. ve. veris	P. ve. macrocalyx	P. el. elatior	0.257	30.553	0.000	0.074	178073	51193	30256
P. ve. veris	P. ve. macrocalyx	P. el. leucophylla	0.302	37.936	0.000	0.069	160349	54687	29308
P. ve. veris	P. ve. macrocalyx	P. el. lofthousei	0.255	27.538	0.000	0.045	207462	46935	27849
P. ve. veris	P. ve. macrocalyx	P. el. meyeri	0.283	36.355	0.000	0.106	168710	51617	28855
P. ve. veris	P. ve. macrocalyx	P. el. meyeri	0.256	32.570	0.000	0.088	171890	49721	29463
P. ve. veris	P. ve. macrocalyx	P. el. pallasii	0.277	32.309	0.000	0.052	209300	48887	27680

<b>P1</b>	<b>P2</b>	<b>P3</b>	<b>Dstatistic</b>	<b>Z-score</b>	<b>p-value</b>	<b>f4-ratio</b>	<b>BBA</b>	<b>ABBA</b>	<b>BABA</b>
P. ve. veris	P. ve. macrocalyx	P. grandis	0.292	35.880	0.000	0.061	330100	47546	26055
P. ve. veris	P. ve. macrocalyx	P. juliae	0.274	34.474	0.000	0.066	169728	50684	28886
P. ve. veris	P. ve. macrocalyx	P. megaseifolia	0.283	35.723	0.000	0.090	187260	49043	27431
P. ve. veris	P. ve. macrocalyx	P. renifolia	0.283	35.731	0.000	0.086	175224	50698	28344
P. ve. veris	P. ve. macrocalyx	P. vu. heterochroma	0.272	34.004	0.000	0.084	170697	51853	29688
P. ve. veris	P. ve. macrocalyx	P. vu. sibthorpii GE	0.267	34.172	0.000	0.081	166740	52113	30148
P. ve. veris	P. ve. macrocalyx	P. vu. sibthorpii TR	0.266	33.039	0.000	0.074	174053	52621	30514
P. ve. veris	P. ve. macrocalyx	P. vu. vulgaris	0.220	25.006	0.000	0.056	176479	51535	32964
P. ve. veris	P. vu. heterochroma	P. grandis	0.347	39.748	0.000	0.147	211269	100368	48632
P. ve. veris	P. vu. sibthorpii GE	P. grandis	0.351	40.008	0.000	0.147	213854	98679	47351
P. ve. veris	P. vu. sibthorpii TR	P. grandis	0.307	32.349	0.000	0.132	214262	99820	52895
P. ve. veris	P. vu. vulgaris	P. grandis	0.262	24.777	0.000	0.114	218635	97411	56932
P. vu. heterochroma	P. el. cordifolia	P. el. elatior	0.041	7.938	0.000	0.021	89686	60880	56052
P. vu. heterochroma	P. el. cordifolia	P. el. meyeri	0.076	15.070	0.000	0.053	83113	62419	53650
P. vu. heterochroma	P. el. cordifolia	P. el. meyeri	0.055	10.992	0.000	0.034	87910	59470	53257
P. vu. heterochroma	P. el. cordifolia	P. el. pseudoelatior	0.091	16.747	0.000	0.055	83602	65395	54529
P. vu. heterochroma	P. el. cordifolia	P. grandis	0.044	10.596	0.000	0.015	233703	53540	49030
P. vu. heterochroma	P. el. cordifolia	P. megaseifolia	0.020	3.642	0.000	0.012	93576	56691	54449
P. vu. heterochroma	P. el. cordifolia	P. renifolia	0.062	12.947	0.000	0.034	87570	60342	53315
P. vu. heterochroma	P. el. cordifolia	P. ve. columnae	0.099	16.323	0.000	0.046	102995	62646	51379
P. vu. heterochroma	P. el. cordifolia	P. ve. macrocalyx	0.120	19.010	0.000	0.069	103713	64426	50590
P. vu. heterochroma	P. el. cordifolia	P. ve. veris	0.094	15.630	0.000	0.046	123430	58632	48561
P. vu. heterochroma	P. el. elatior	P. el. pallasii	0.048	7.290	0.000	0.020	86552	74989	68140
P. vu. heterochroma	P. el. elatior	P. grandis	0.157	31.850	0.000	0.065	205116	72082	52509
P. vu. heterochroma	P. el. leucophylla	P. el. elatior	0.037	7.360	0.000	0.019	89780	60837	56449
P. vu. heterochroma	P. el. leucophylla	P. el. meyeri	0.074	14.548	0.000	0.052	83114	62579	53946
P. vu. heterochroma	P. el. leucophylla	P. el. meyeri	0.053	10.444	0.000	0.033	87945	59586	53568
P. vu. heterochroma	P. el. leucophylla	P. el. pseudoelatior	0.087	16.153	0.000	0.054	83832	65404	54923
P. vu. heterochroma	P. el. leucophylla	P. grandis	0.037	8.924	0.000	0.013	232372	53263	49458
P. vu. heterochroma	P. el. leucophylla	P. megaseifolia	0.018	3.297	0.000	0.011	93570	56823	54802
P. vu. heterochroma	P. el. leucophylla	P. renifolia	0.058	11.818	0.000	0.032	87639	60301	53723
P. vu. heterochroma	P. el. leucophylla	P. ve. columnae	0.087	14.829	0.000	0.041	103429	61990	52057
P. vu. heterochroma	P. el. leucophylla	P. ve. macrocalyx	0.106	17.853	0.000	0.061	104238	63509	51367
P. vu. heterochroma	P. el. leucophylla	P. ve. veris	0.081	14.171	0.000	0.040	123911	57990	49294
P. vu. heterochroma	P. el. meyeri	P. grandis	0.213	47.652	0.000	0.086	202931	72424	47030
P. vu. heterochroma	P. el. meyeri	P. grandis	0.207	42.847	0.000	0.086	198195	73839	48510
P. vu. heterochroma	P. el. meyeri	P. ve. columnae	0.004	0.570	0.284	0.002	85652	63663	63146
P. vu. heterochroma	P. el. meyeri	P. ve. macrocalyx	0.013	1.834	0.033	0.008	86645	64274	62659
P. vu. heterochroma	P. el. meyeri	P. ve. veris	0.008	1.138	0.127	0.005	105682	60764	59748
P. vu. heterochroma	P. juliae	P. el. lofthousei	0.016	2.660	0.004	0.005	101838	57703	55920
P. vu. heterochroma	P. juliae	P. el. meyeri	0.007	1.448	0.074	0.005	80188	59983	59109
P. vu. heterochroma	P. juliae	P. el. meyeri	0.006	1.080	0.140	0.004	84191	58502	57839
P. vu. heterochroma	P. juliae	P. el. pallasii	0.010	1.743	0.041	0.003	101124	59264	58097

<b>P1</b>	<b>P2</b>	<b>P3</b>	<b>Dstatistic</b>	<b>Z-score</b>	<b>p-value</b>	<b>f4-ratio</b>	<b>BBA</b>	<b>ABBA</b>	<b>BABA</b>
P. vu. heterochroma	P. juliae	P. grandis	0.026	6.339	0.000	0.010	227212	54348	51575
P. vu. heterochroma	P. juliae	P. renifolia	0.010	1.906	0.028	0.006	84083	59238	58046
P. vu. heterochroma	P. megaseifolia	P. grandis	0.175	33.944	0.000	0.073	196676	72480	50915
P. vu. heterochroma	P. renifolia	P. grandis	0.226	49.291	0.000	0.094	198352	75396	47551
P. vu. heterochroma	P. ve. veris	P. el. pseudoelator	0.139	13.585	0.000	0.136	37705	110502	83494
P. vu. heterochroma	P. vu. sibthorpii GE	P. el. cordifolia	0.020	3.381	0.000	0.007	145747	46216	44374
P. vu. heterochroma	P. vu. sibthorpii GE	P. el. elatior	0.016	3.683	0.000	0.006	177474	42379	41019
P. vu. heterochroma	P. vu. sibthorpii GE	P. el. leucophylla	0.021	3.433	0.000	0.006	144874	46409	44514
P. vu. heterochroma	P. vu. sibthorpii GE	P. el. meyeri	0.028	5.705	0.000	0.014	171364	42129	39824
P. vu. heterochroma	P. vu. sibthorpii GE	P. el. meyeri	0.015	3.167	0.001	0.007	175362	40719	39504
P. vu. heterochroma	P. vu. sibthorpii GE	P. el. pseudoelator	0.060	10.573	0.000	0.026	171027	44751	39707
P. vu. heterochroma	P. vu. sibthorpii GE	P. juliae	0.020	3.568	0.000	0.007	151541	44672	42914
P. vu. heterochroma	P. vu. sibthorpii GE	P. megaseifolia	0.009	2.038	0.021	0.004	180424	40393	39668
P. vu. heterochroma	P. vu. sibthorpii GE	P. renifolia	0.017	3.496	0.000	0.007	175912	41171	39756
P. vu. heterochroma	P. vu. sibthorpii GE	P. ve. columnae	0.049	9.081	0.000	0.016	192500	42017	38082
P. vu. heterochroma	P. vu. sibthorpii GE	P. ve. macrocalyx	0.049	9.193	0.000	0.019	194275	41932	38033
P. vu. heterochroma	P. vu. sibthorpii GE	P. ve. veris	0.053	9.852	0.000	0.018	214128	39846	35859
P. vu. heterochroma	P. vu. sibthorpii GE	P. vu. sibthorpii TR	0.085	11.133	0.000	0.066	96747	64833	54660
P. vu. heterochroma	P. vu. sibthorpii GE	P. vu. vulgaris	0.067	8.521	0.000	0.038	109230	60882	53184
P. vu. heterochroma	P. vu. sibthorpii TR	P. el. cordifolia	0.023	4.164	0.000	0.009	114149	56478	53958
P. vu. heterochroma	P. vu. sibthorpii TR	P. el. elatior	0.002	0.459	0.323	0.001	145569	50733	50500
P. vu. heterochroma	P. vu. sibthorpii TR	P. el. leucophylla	0.018	3.361	0.000	0.007	113877	56285	54264
P. vu. sibthorpii GE	P. el. cordifolia	P. el. elatior	0.030	5.749	0.000	0.015	89752	59213	55738
P. vu. sibthorpii GE	P. el. cordifolia	P. el. meyeri	0.056	10.200	0.000	0.039	82827	60363	53916
P. vu. sibthorpii GE	P. el. cordifolia	P. el. meyeri	0.045	8.349	0.000	0.027	88147	57902	52938
P. vu. sibthorpii GE	P. el. cordifolia	P. el. pseudoelator	0.049	8.054	0.000	0.030	82294	62394	56607
P. vu. sibthorpii GE	P. el. cordifolia	P. grandis	0.044	10.384	0.000	0.015	234623	52812	48360
P. vu. sibthorpii GE	P. el. cordifolia	P. megaseifolia	0.013	2.394	0.008	0.008	93962	55361	53887
P. vu. sibthorpii GE	P. el. cordifolia	P. renifolia	0.050	9.615	0.000	0.027	87639	58617	53050
P. vu. sibthorpii GE	P. el. cordifolia	P. ve. columnae	0.064	10.694	0.000	0.030	101918	60042	52770
P. vu. sibthorpii GE	P. el. cordifolia	P. ve. macrocalyx	0.087	14.044	0.000	0.050	102552	61773	51879
P. vu. sibthorpii GE	P. el. cordifolia	P. ve. veris	0.057	9.588	0.000	0.028	122173	56049	49972
P. vu. sibthorpii GE	P. el. elatior	P. el. pallasii	0.073	11.069	0.000	0.030	88502	75590	65320
P. vu. sibthorpii GE	P. el. elatior	P. grandis	0.158	31.373	0.000	0.065	205888	71559	52022
P. vu. sibthorpii GE	P. el. leucophylla	P. el. elatior	0.026	5.016	0.000	0.013	89862	59125	56119
P. vu. sibthorpii GE	P. el. leucophylla	P. el. meyeri	0.055	9.773	0.000	0.039	82812	60449	54166
P. vu. sibthorpii GE	P. el. leucophylla	P. el. meyeri	0.042	7.885	0.000	0.026	88156	57962	53246
P. vu. sibthorpii GE	P. el. leucophylla	P. el. pseudoelator	0.045	7.519	0.000	0.029	82548	62375	56967
P. vu. sibthorpii GE	P. el. leucophylla	P. grandis	0.037	8.664	0.000	0.013	233298	52495	48777
P. vu. sibthorpii GE	P. el. leucophylla	P. megaseifolia	0.011	1.974	0.024	0.007	93974	55452	54222
P. vu. sibthorpii GE	P. el. leucophylla	P. renifolia	0.045	8.738	0.000	0.025	87719	58543	53448
P. vu. sibthorpii GE	P. el. leucophylla	P. ve. columnae	0.052	8.815	0.000	0.025	102373	59346	53439
P. vu. sibthorpii GE	P. el. leucophylla	P. ve. macrocalyx	0.072	12.368	0.000	0.042	103105	60829	52646

<b>P1</b>	<b>P2</b>	<b>P3</b>	<b>Dstatistic</b>	<b>Z-score</b>	<b>p-value</b>	<b>f4-ratio</b>	<b>BBAA</b>	<b>ABBA</b>	<b>BABA</b>
P. vu. sibthorpii GE	P. el. leucophylla	P. ve. veris	0.044	7.756	0.000	0.022	122693	55392	50694
P. vu. sibthorpii GE	P. el. meyeri	P. grandis	0.215	47.515	0.000	0.086	204307	71575	46245
P. vu. sibthorpii GE	P. el. meyeri	P. grandis	0.208	42.809	0.000	0.086	198744	73248	48000
P. vu. sibthorpii GE	P. juliae	P. el. cordifolia	0.054	6.506	0.000	0.027	57235	72864	65336
P. vu. sibthorpii GE	P. juliae	P. el. leucophylla	0.060	7.090	0.000	0.029	57168	73526	65176
P. vu. sibthorpii GE	P. juliae	P. el. lofthousei	0.046	8.405	0.000	0.014	103953	58155	53086
P. vu. sibthorpii GE	P. juliae	P. el. pallasii	0.039	7.162	0.000	0.013	103337	59780	55335
P. vu. sibthorpii GE	P. juliae	P. grandis	0.026	6.568	0.000	0.009	228206	53772	51031
P. vu. sibthorpii GE	P. megaseifolia	P. el. lofthousei	0.007	1.267	0.103	0.003	83796	64759	63812
P. vu. sibthorpii GE	P. megaseifolia	P. el. meyeri	0.070	10.822	0.000	0.060	53278	74438	64649
P. vu. sibthorpii GE	P. megaseifolia	P. el. pallasii	0.008	1.389	0.082	0.003	82734	67222	66161
P. vu. sibthorpii GE	P. megaseifolia	P. grandis	0.175	33.361	0.000	0.073	197000	72168	50663
P. vu. sibthorpii GE	P. renifolia	P. grandis	0.228	48.947	0.000	0.094	199028	74731	46966
P. vu. sibthorpii GE	P. ve. veris	P. el. pseudoelator	0.115	10.436	0.000	0.114	38163	106769	84743
P. vu. sibthorpii GE	P. vu. heterochroma	P. el. lofthousei	0.042	9.122	0.000	0.009	194218	41206	37858
P. vu. sibthorpii GE	P. vu. heterochroma	P. el. pallasii	0.041	8.822	0.000	0.010	195977	42907	39541
P. vu. sibthorpii GE	P. vu. heterochroma	P. grandis	0.000	0.010	0.496	0.000	324553	37179	37176
P. vu. sibthorpii GE	P. vu. sibthorpii TR	P. el. cordifolia	0.006	1.108	0.134	0.002	120346	52750	52069
P. vu. sibthorpii GE	P. vu. sibthorpii TR	P. el. leucophylla	0.001	0.226	0.411	0.000	119984	52534	52396
P. vu. sibthorpii TR	P. el. cordifolia	P. el. elatior	0.039	6.781	0.000	0.020	93748	62231	57616
P. vu. sibthorpii TR	P. el. cordifolia	P. el. lofthousei	0.039	6.649	0.000	0.012	117268	56725	52478
P. vu. sibthorpii TR	P. el. cordifolia	P. el. meyeri	0.097	17.921	0.000	0.067	87757	64414	52978
P. vu. sibthorpii TR	P. el. cordifolia	P. el. meyeri	0.087	15.331	0.000	0.053	92936	61779	51866
P. vu. sibthorpii TR	P. el. cordifolia	P. el. pallasii	0.043	7.584	0.000	0.014	116510	58786	53885
P. vu. sibthorpii TR	P. el. cordifolia	P. el. pseudoelator	0.099	16.783	0.000	0.060	87600	66617	54666
P. vu. sibthorpii TR	P. el. cordifolia	P. grandis	0.095	19.563	0.000	0.033	240385	57036	47148
P. vu. sibthorpii TR	P. el. cordifolia	P. megaseifolia	0.058	8.930	0.000	0.035	99000	59424	52872
P. vu. sibthorpii TR	P. el. cordifolia	P. renifolia	0.089	16.144	0.000	0.048	92364	62371	52135
P. vu. sibthorpii TR	P. el. cordifolia	P. ve. columnae	0.104	16.114	0.000	0.049	107368	63991	51896
P. vu. sibthorpii TR	P. el. cordifolia	P. ve. macrocalyx	0.137	21.038	0.000	0.078	108316	66004	50065
P. vu. sibthorpii TR	P. el. cordifolia	P. ve. veris	0.109	17.324	0.000	0.053	128294	60207	48388
P. vu. sibthorpii TR	P. el. elatior	P. grandis	0.197	36.905	0.000	0.082	210155	76455	51332
P. vu. sibthorpii TR	P. el. leucophylla	P. el. elatior	0.034	6.145	0.000	0.018	93405	62252	58116
P. vu. sibthorpii TR	P. el. leucophylla	P. el. lofthousei	0.035	5.826	0.000	0.010	117227	56940	53139
P. vu. sibthorpii TR	P. el. leucophylla	P. el. meyeri	0.095	17.481	0.000	0.067	87300	64613	53375
P. vu. sibthorpii TR	P. el. leucophylla	P. el. meyeri	0.084	14.604	0.000	0.052	92536	61968	52356
P. vu. sibthorpii TR	P. el. leucophylla	P. el. pallasii	0.039	6.778	0.000	0.013	116396	59002	54545
P. vu. sibthorpii TR	P. el. leucophylla	P. el. pseudoelator	0.094	16.259	0.000	0.059	87415	66695	55192
P. vu. sibthorpii TR	P. el. leucophylla	P. grandis	0.087	17.862	0.000	0.031	238598	56811	47720
P. vu. sibthorpii TR	P. el. leucophylla	P. megaseifolia	0.055	8.411	0.000	0.034	98553	59623	53372
P. vu. sibthorpii TR	P. el. leucophylla	P. renifolia	0.084	15.186	0.000	0.047	92021	62425	52704
P. vu. sibthorpii TR	P. el. leucophylla	P. ve. columnae	0.092	14.444	0.000	0.043	107348	63382	52704
P. vu. sibthorpii TR	P. el. leucophylla	P. ve. macrocalyx	0.122	20.057	0.000	0.070	108385	65127	50964

<b>P1</b>	<b>P2</b>	<b>P3</b>	<b>Dstatistic</b>	<b>Z-score</b>	<b>p-value</b>	<b>f4-ratio</b>	<b>BBAA</b>	<b>ABBA</b>	<b>BABA</b>
P. vu. sibthorpii TR	P. el. leucophylla	P. ve. veris	0.095	15.765	0.000	0.047	128347	59630	49272
P. vu. sibthorpii TR	P. el. meyeri	P. el. lofthousei	0.011	1.953	0.025	0.004	93147	63726	62316
P. vu. sibthorpii TR	P. el. meyeri	P. el. lofthousei	0.031	5.513	0.000	0.011	87636	67576	63478
P. vu. sibthorpii TR	P. el. meyeri	P. el. pallasii	0.025	4.484	0.000	0.009	91913	66991	63706
P. vu. sibthorpii TR	P. el. meyeri	P. el. pallasii	0.034	6.007	0.000	0.013	86792	69923	65377
P. vu. sibthorpii TR	P. el. meyeri	P. grandis	0.251	52.217	0.000	0.102	205435	77245	46288
P. vu. sibthorpii TR	P. el. meyeri	P. grandis	0.242	47.199	0.000	0.102	199918	78945	48162
P. vu. sibthorpii TR	P. el. meyeri	P. ve. columnae	0.011	1.608	0.054	0.006	86132	66538	65115
P. vu. sibthorpii TR	P. el. meyeri	P. ve. macrocalyx	0.029	4.524	0.000	0.018	87338	67366	63585
P. vu. sibthorpii TR	P. el. meyeri	P. ve. veris	0.023	3.382	0.000	0.013	106535	63766	60910
P. vu. sibthorpii TR	P. el. pallasii	P. grandis	0.011	2.224	0.013	0.005	199551	70597	69089
P. vu. sibthorpii TR	P. juliae	P. el. cordifolia	0.048	5.506	0.000	0.025	56964	75785	68791
P. vu. sibthorpii TR	P. juliae	P. el. leucophylla	0.058	6.464	0.000	0.029	57057	76548	68204
P. vu. sibthorpii TR	P. juliae	P. el. lofthousei	0.081	13.554	0.000	0.026	105844	62663	53246
P. vu. sibthorpii TR	P. juliae	P. el. meyeri	0.029	5.068	0.000	0.021	82044	63013	59488
P. vu. sibthorpii TR	P. juliae	P. el. meyeri	0.036	6.291	0.000	0.023	86514	61818	57544
P. vu. sibthorpii TR	P. juliae	P. el. pallasii	0.079	13.613	0.000	0.028	105317	64535	55033
P. vu. sibthorpii TR	P. juliae	P. grandis	0.074	15.677	0.000	0.027	230905	58706	50649
P. vu. sibthorpii TR	P. juliae	P. megaseifolia	0.026	4.330	0.000	0.017	91587	60749	57661
P. vu. sibthorpii TR	P. juliae	P. renifolia	0.036	6.154	0.000	0.021	86003	62256	57915
P. vu. sibthorpii TR	P. juliae	P. ve. macrocalyx	0.006	1.007	0.157	0.003	103996	59179	58492
P. vu. sibthorpii TR	P. juliae	P. ve. veris	0.001	0.194	0.423	0.001	122831	56173	56041
P. vu. sibthorpii TR	P. megaseifolia	P. el. elatior	0.064	10.237	0.000	0.041	59316	79210	69742
P. vu. sibthorpii TR	P. megaseifolia	P. el. lofthousei	0.039	6.421	0.000	0.014	84235	69991	64769
P. vu. sibthorpii TR	P. megaseifolia	P. el. pallasii	0.044	7.557	0.000	0.018	83174	72692	66560
P. vu. sibthorpii TR	P. megaseifolia	P. grandis	0.210	39.029	0.000	0.089	198071	77812	50782
P. vu. sibthorpii TR	P. renifolia	P. el. lofthousei	0.018	3.164	0.001	0.006	89067	66011	63689
P. vu. sibthorpii TR	P. renifolia	P. el. pallasii	0.023	4.140	0.000	0.009	88095	68605	65515
P. vu. sibthorpii TR	P. renifolia	P. grandis	0.262	53.926	0.000	0.110	200379	80324	46932
P. vu. sibthorpii TR	P. ve. veris	P. el. pseudoelatior	0.141	13.036	0.000	0.139	38191	113182	85141
P. vu. sibthorpii TR	P. vu. heterochroma	P. el. lofthousei	0.082	16.278	0.000	0.021	164363	51130	43399
P. vu. sibthorpii TR	P. vu. heterochroma	P. el. meyeri	0.027	5.192	0.000	0.016	140721	50335	47649
P. vu. sibthorpii TR	P. vu. heterochroma	P. el. meyeri	0.038	7.491	0.000	0.019	144962	49824	46136
P. vu. sibthorpii TR	P. vu. heterochroma	P. el. pallasii	0.087	18.202	0.000	0.024	165407	53264	44753
P. vu. sibthorpii TR	P. vu. heterochroma	P. el. pseudoelatior	0.011	2.031	0.021	0.006	141037	50727	49595
P. vu. sibthorpii TR	P. vu. heterochroma	P. grandis	0.061	14.343	0.000	0.018	293890	47039	41616
P. vu. sibthorpii TR	P. vu. heterochroma	P. juliae	0.012	1.849	0.032	0.005	121254	53502	52246
P. vu. sibthorpii TR	P. vu. heterochroma	P. megaseifolia	0.045	8.499	0.000	0.023	149903	50079	45759
P. vu. sibthorpii TR	P. vu. heterochroma	P. renifolia	0.033	6.221	0.000	0.015	145041	49904	46691
P. vu. sibthorpii TR	P. vu. heterochroma	P. ve. columnae	0.009	1.396	0.081	0.003	162026	48348	47505
P. vu. sibthorpii TR	P. vu. heterochroma	P. ve. macrocalyx	0.022	3.876	0.000	0.010	163972	48548	46438
P. vu. sibthorpii TR	P. vu. heterochroma	P. ve. veris	0.020	3.329	0.000	0.008	183774	46042	44268
P. vu. sibthorpii TR	P. vu. sibthorpii GE	P. el. elatior	0.012	2.285	0.011	0.005	152300	48693	47583

<b>P1</b>	<b>P2</b>	<b>P3</b>	<b>Dstatistic</b>	<b>Z-score</b>	<b>p-value</b>	<b>f4-ratio</b>	<b>BBA</b>	<b>ABBA</b>	<b>BABA</b>
P. vu. sibthorpii TR	P. vu. sibthorpii GE	P. el. lofthousei	0.048	9.280	0.000	0.012	172858	46522	42262
P. vu. sibthorpii TR	P. vu. sibthorpii GE	P. el. meyeri	0.053	10.019	0.000	0.029	147114	49184	44224
P. vu. sibthorpii TR	P. vu. sibthorpii GE	P. el. meyeri	0.053	11.010	0.000	0.026	151741	48023	43152
P. vu. sibthorpii TR	P. vu. sibthorpii GE	P. el. pallasii	0.055	11.847	0.000	0.014	173948	48540	43492
P. vu. sibthorpii TR	P. vu. sibthorpii GE	P. el. pseudoelator	0.064	12.088	0.000	0.031	146237	51242	45087
P. vu. sibthorpii TR	P. vu. sibthorpii GE	P. grandis	0.063	15.446	0.000	0.018	301511	45003	39643
P. vu. sibthorpii TR	P. vu. sibthorpii GE	P. juliae	0.030	4.787	0.000	0.011	127651	51741	48743
P. vu. sibthorpii TR	P. vu. sibthorpii GE	P. megaseifolia	0.055	10.266	0.000	0.027	156962	48002	43023
P. vu. sibthorpii TR	P. vu. sibthorpii GE	P. renifolia	0.050	9.778	0.000	0.022	151755	48218	43618
P. vu. sibthorpii TR	P. vu. sibthorpii GE	P. ve. columnae	0.052	8.683	0.000	0.019	167527	48245	43443
P. vu. sibthorpii TR	P. vu. sibthorpii GE	P. ve. macrocalyx	0.066	12.365	0.000	0.029	169525	48444	42418
P. vu. sibthorpii TR	P. vu. sibthorpii GE	P. ve. veris	0.067	11.796	0.000	0.026	189238	46052	40261
P. vu. sibthorpii TR	P. vu. vulgaris	P. ve. veris	0.003	0.415	0.339	0.001	269366	34822	34640
P. vu. vulgaris	P. el. cordifolia	P. el. elatior	0.037	5.503	0.000	0.021	91079	67015	62188
P. vu. vulgaris	P. el. cordifolia	P. el. lofthousei	0.079	11.600	0.000	0.025	115838	62385	53245
P. vu. vulgaris	P. el. cordifolia	P. el. meyeri	0.128	20.348	0.000	0.079	91204	67347	52082
P. vu. vulgaris	P. el. cordifolia	P. el. pallasii	0.102	16.700	0.000	0.034	115484	65073	53065
P. vu. vulgaris	P. el. cordifolia	P. grandis	0.149	27.885	0.000	0.053	238987	62929	46572
P. vu. vulgaris	P. el. cordifolia	P. megaseifolia	0.119	18.542	0.000	0.072	97885	65690	51740
P. vu. vulgaris	P. el. cordifolia	P. renifolia	0.131	22.362	0.000	0.073	90693	68081	52283
P. vu. vulgaris	P. el. cordifolia	P. ve. columnae	0.135	19.491	0.000	0.065	105268	69208	52721
P. vu. vulgaris	P. el. cordifolia	P. ve. macrocalyx	0.157	22.398	0.000	0.093	105921	70971	51665
P. vu. vulgaris	P. el. cordifolia	P. ve. veris	0.100	13.495	0.000	0.052	124872	64087	52436
P. vu. vulgaris	P. el. elatior	P. grandis	0.242	45.167	0.000	0.101	215003	81448	49685
P. vu. vulgaris	P. el. leucophylla	P. el. elatior	0.033	5.024	0.000	0.019	89954	67217	62863
P. vu. vulgaris	P. el. leucophylla	P. el. lofthousei	0.074	10.807	0.000	0.023	115012	62753	54111
P. vu. vulgaris	P. el. leucophylla	P. el. meyeri	0.124	19.684	0.000	0.078	90026	67711	52797
P. vu. vulgaris	P. el. leucophylla	P. el. pallasii	0.096	15.895	0.000	0.032	114563	65436	53933
P. vu. vulgaris	P. el. leucophylla	P. grandis	0.141	26.414	0.000	0.051	236365	62820	47337
P. vu. vulgaris	P. el. leucophylla	P. megaseifolia	0.114	17.863	0.000	0.071	96629	66037	52481
P. vu. vulgaris	P. el. leucophylla	P. renifolia	0.125	21.363	0.000	0.071	89568	68298	53087
P. vu. vulgaris	P. el. leucophylla	P. ve. columnae	0.122	17.816	0.000	0.060	104460	68773	53773
P. vu. vulgaris	P. el. leucophylla	P. ve. macrocalyx	0.142	21.332	0.000	0.085	105201	70269	52793
P. vu. vulgaris	P. el. leucophylla	P. ve. veris	0.087	12.018	0.000	0.046	124124	63676	53528
P. vu. vulgaris	P. el. lofthousei	P. grandis	0.036	6.590	0.000	0.017	194504	73991	68915
P. vu. vulgaris	P. el. meyeri	P. el. lofthousei	0.049	7.588	0.000	0.017	93554	68760	62378
P. vu. vulgaris	P. el. meyeri	P. el. lofthousei	0.066	10.616	0.000	0.024	87572	72697	63673
P. vu. vulgaris	P. el. meyeri	P. el. pallasii	0.078	13.430	0.000	0.029	92747	72651	62177
P. vu. vulgaris	P. el. meyeri	P. grandis	0.293	58.302	0.000	0.121	206270	82834	45309
P. vu. vulgaris	P. el. meyeri	P. grandis	0.283	54.250	0.000	0.121	200240	84594	47288
P. vu. vulgaris	P. el. meyeri	P. ve. columnae	0.043	5.842	0.000	0.023	86005	71192	65365
P. vu. vulgaris	P. el. meyeri	P. ve. columnae	0.003	0.364	0.358	0.001	82882	70336	69985
P. vu. vulgaris	P. el. meyeri	P. ve. macrocalyx	0.052	7.496	0.000	0.034	86939	71781	64631

<b>P1</b>	<b>P2</b>	<b>P3</b>	<b>Dstatistic</b>	<b>Z-score</b>	<b>p-value</b>	<b>f4-ratio</b>	<b>BBAA</b>	<b>ABBA</b>	<b>BABA</b>
P. vu. vulgaris	P. el. meyeri	P. ve. macrocalyx	0.009	1.348	0.089	0.006	84002	70717	69471
P. vu. vulgaris	P. el. meyeri	P. ve. veris	0.020	2.680	0.004	0.012	105207	67188	64552
P. vu. vulgaris	P. el. pallasii	P. grandis	0.055	10.885	0.000	0.026	198643	76725	68721
P. vu. vulgaris	P. el. pseudoelator	P. grandis	0.012	1.356	0.088	0.005	222845	63322	61815
P. vu. vulgaris	P. juliae	P. el. cordifolia	0.094	10.284	0.000	0.050	55435	82853	68558
P. vu. vulgaris	P. juliae	P. el. lofthousei	0.116	18.359	0.000	0.039	103639	68742	54445
P. vu. vulgaris	P. juliae	P. el. meyeri	0.064	10.745	0.000	0.048	79329	68921	60616
P. vu. vulgaris	P. juliae	P. el. meyeri	0.076	12.422	0.000	0.050	83908	67770	58181
P. vu. vulgaris	P. juliae	P. el. pallasii	0.132	22.394	0.000	0.047	103496	71299	54694
P. vu. vulgaris	P. juliae	P. el. pseudoelator	0.041	6.419	0.000	0.026	80905	67935	62592
P. vu. vulgaris	P. juliae	P. grandis	0.126	24.601	0.000	0.047	228641	64940	50456
P. vu. vulgaris	P. juliae	P. megaseifolia	0.083	13.382	0.000	0.054	89677	67464	57078
P. vu. vulgaris	P. juliae	P. renifolia	0.078	12.611	0.000	0.046	83522	68382	58526
P. vu. vulgaris	P. juliae	P. ve. columnae	0.028	4.196	0.000	0.014	99391	64359	60907
P. vu. vulgaris	P. juliae	P. ve. macrocalyx	0.032	4.965	0.000	0.019	100725	64505	60530
P. vu. vulgaris	P. megaseifolia	P. el. elatior	0.061	8.572	0.000	0.042	56962	84399	74692
P. vu. vulgaris	P. megaseifolia	P. grandis	0.250	45.440	0.000	0.109	197018	84111	50514
P. vu. vulgaris	P. renifolia	P. el. lofthousei	0.054	8.536	0.000	0.020	88969	71259	63982
P. vu. vulgaris	P. renifolia	P. el. pallasii	0.074	13.166	0.000	0.029	88442	74527	64246
P. vu. vulgaris	P. renifolia	P. grandis	0.302	60.493	0.000	0.129	200651	86122	46150
P. vu. vulgaris	P. ve. veris	P. el. pseudoelator	0.172	16.247	0.000	0.165	41794	116669	82349
P. vu. vulgaris	P. vu. heterochroma	P. el. cordifolia	0.041	6.806	0.000	0.017	108175	61741	56827
P. vu. vulgaris	P. vu. heterochroma	P. el. elatior	0.000	0.002	0.499	0.000	137617	56500	56498
P. vu. vulgaris	P. vu. heterochroma	P. el. leucophylla	0.054	8.701	0.000	0.021	108308	62295	55923
P. vu. vulgaris	P. vu. heterochroma	P. el. lofthousei	0.123	19.787	0.000	0.034	157719	57866	45182
P. vu. vulgaris	P. vu. heterochroma	P. el. meyeri	0.071	11.883	0.000	0.043	133606	57074	49485
P. vu. vulgaris	P. vu. heterochroma	P. el. meyeri	0.088	14.763	0.000	0.047	137995	56613	47447
P. vu. vulgaris	P. vu. heterochroma	P. el. pallasii	0.148	26.843	0.000	0.044	159163	60769	45060
P. vu. vulgaris	P. vu. heterochroma	P. el. pseudoelator	0.068	11.342	0.000	0.036	134505	57988	50596
P. vu. vulgaris	P. vu. heterochroma	P. grandis	0.125	25.183	0.000	0.038	287011	53916	41955
P. vu. vulgaris	P. vu. heterochroma	P. juliae	0.087	13.554	0.000	0.036	115833	61659	51768
P. vu. vulgaris	P. vu. heterochroma	P. megaseifolia	0.114	20.134	0.000	0.060	143573	57570	45782
P. vu. vulgaris	P. vu. heterochroma	P. renifolia	0.085	14.356	0.000	0.041	138094	56817	47933
P. vu. vulgaris	P. vu. heterochroma	P. ve. columnae	0.051	7.436	0.000	0.021	154636	54753	49482
P. vu. vulgaris	P. vu. heterochroma	P. ve. macrocalyx	0.053	8.088	0.000	0.026	156253	54681	49174
P. vu. vulgaris	P. vu. heterochroma	P. ve. veris	0.016	2.125	0.017	0.007	174957	51031	49455
P. vu. vulgaris	P. vu. sibthorpii GE	P. el. cordifolia	0.059	9.295	0.000	0.023	112379	60293	53551
P. vu. vulgaris	P. vu. sibthorpii GE	P. el. elatior	0.012	1.955	0.025	0.006	142248	55041	53685
P. vu. vulgaris	P. vu. sibthorpii GE	P. el. leucophylla	0.073	11.083	0.000	0.027	112465	60854	52622
P. vu. vulgaris	P. vu. sibthorpii GE	P. el. lofthousei	0.094	15.135	0.000	0.025	164095	53474	44295
P. vu. vulgaris	P. vu. sibthorpii GE	P. el. meyeri	0.096	16.038	0.000	0.056	137902	56256	46413
P. vu. vulgaris	P. vu. sibthorpii GE	P. el. meyeri	0.103	18.707	0.000	0.053	142656	55104	44780
P. vu. vulgaris	P. vu. sibthorpii GE	P. el. pallasii	0.121	22.718	0.000	0.034	165558	56337	44146

<b>P1</b>	<b>P2</b>	<b>P3</b>	<b>Dstatistic</b>	<b>Z-score</b>	<b>p-value</b>	<b>f4-ratio</b>	<b>BBAA</b>	<b>ABBA</b>	<b>BABA</b>
P. vu. vulgaris	P. vu. sibthorpii GE	P. el. pseudoelator	0.118	20.990	0.000	0.060	137691	58911	46503
P. vu. vulgaris	P. vu. sibthorpii GE	P. grandis	0.129	26.645	0.000	0.038	292563	52157	40263
P. vu. vulgaris	P. vu. sibthorpii GE	P. juliae	0.107	16.814	0.000	0.043	120126	60246	48639
P. vu. vulgaris	P. vu. sibthorpii GE	P. megaseifolia	0.125	22.219	0.000	0.064	148553	55838	43396
P. vu. vulgaris	P. vu. sibthorpii GE	P. renifolia	0.102	18.553	0.000	0.047	142718	55449	45197
P. vu. vulgaris	P. vu. sibthorpii GE	P. ve. columnae	0.091	14.570	0.000	0.036	158116	55055	45827
P. vu. vulgaris	P. vu. sibthorpii GE	P. ve. macrocalyx	0.094	15.594	0.000	0.045	159763	54975	45559
P. vu. vulgaris	P. vu. sibthorpii GE	P. ve. veris	0.058	8.321	0.000	0.025	178356	51413	45818
P. vu. vulgaris	P. vu. sibthorpii TR	P. el. cordifolia	0.094	18.207	0.000	0.026	194036	43607	36140
P. vu. vulgaris	P. vu. sibthorpii TR	P. el. elatior	0.003	0.480	0.316	0.001	228811	39542	39294
P. vu. vulgaris	P. vu. sibthorpii TR	P. el. leucophylla	0.106	20.341	0.000	0.027	193326	44000	35573
P. vu. vulgaris	P. vu. sibthorpii TR	P. el. lofthousei	0.071	12.575	0.000	0.013	249468	37854	32865
P. vu. vulgaris	P. vu. sibthorpii TR	P. el. meyeri	0.067	12.565	0.000	0.028	225823	39031	34100
P. vu. vulgaris	P. vu. sibthorpii TR	P. el. meyeri	0.077	14.502	0.000	0.028	230366	38542	33030
P. vu. vulgaris	P. vu. sibthorpii TR	P. el. pallasii	0.100	20.038	0.000	0.020	253857	39893	32661
P. vu. vulgaris	P. vu. sibthorpii TR	P. el. pseudoelator	0.085	16.493	0.000	0.030	225581	40412	34098
P. vu. vulgaris	P. vu. sibthorpii TR	P. grandis	0.099	22.317	0.000	0.021	383226	36591	29997
P. vu. vulgaris	P. vu. sibthorpii TR	P. juliae	0.113	21.228	0.000	0.032	204100	42737	34058
P. vu. vulgaris	P. vu. sibthorpii TR	P. megaseifolia	0.105	21.263	0.000	0.038	236925	39437	31916
P. vu. vulgaris	P. vu. sibthorpii TR	P. renifolia	0.079	15.132	0.000	0.026	230869	38933	33232
P. vu. vulgaris	P. vu. sibthorpii TR	P. ve. columnae	0.062	11.560	0.000	0.017	247380	38418	33954
P. vu. vulgaris	P. vu. sibthorpii TR	P. ve. macrocalyx	0.048	9.567	0.000	0.016	249854	37515	34089
P. vu. vulgaris	P. vu. sibthorpii TR	P. vu. heterochroma	0.145	25.734	0.000	0.100	148455	55404	41385
P. vu. vulgaris	P. vu. sibthorpii TR	P. vu. sibthorpii GE	0.164	22.911	0.000	0.115	141150	58614	42125



SUPPLEMENTARY TABLE S5. Posterior probabilities for every state in ancestral state estimation in *Primula* sect. *Primula*. Node number corresponds to Figure S6. A=Alps, B=British Isles, C=Caucasus, I=Iberian Peninsula, R=Carpathians, S=Siberia/northern Asia.

N o d e	A	A+B +C	A+B+ C+I	A+B + C+I+ R	A+B + C+I +S	A+B+ C+R	A+B + C+S	A+B+I	A+B+ I+R	A+B + I+ R+S	A+B +S	A+C	A+C +I	A+C + I+R	A+C+ I+R +S	A+C + I+S	A+C +R	A+C+ R+S	A+C +S	A+I	A+R	A+R +S	A+S	B	B+C +I	B+C
1	0	0.01	0.004	0	0	0.003	0.003	0.001	0.001	0	0	0.067	0.015	0.004	0.001	0	0.015	0.001	0.014	0.001	0	0	0	0.001	0.023	0.069
2	0	0.001	0	0	0	0	0	0	0	0	0	0.029	0.001	0	0	0	0.003	0	0	0	0	0	0	0	0	0.015
3	0	0.001	0	0	0	0	0	0	0	0	0	0.015	0	0	0	0	0.001	0	0	0	0	0	0	0	0	0.011
4	0	0.001	0	0	0	0	0	0	0	0	0	0.02	0	0	0	0	0	0	0.001	0	0	0	0	0	0	0.015
5	0	0.001	0	0	0	0	0	0	0	0	0	0.033	0	0	0	0	0.001	0	0	0	0	0	0	0	0.001	0.025
6	0	0	0	0	0	0	0	0	0	0	0	0.009	0	0	0	0	0	0	0	0	0	0	0	0	0	0.013
7	0	0	0	0	0	0	0	0	0	0	0	0.014	0	0	0	0	0.001	0	0	0	0	0	0	0	0	0.004
8	0	0	0	0	0	0	0	0	0	0	0	0.008	0	0	0	0	0	0	0	0	0	0	0	0	0	0.002
9	0	0.003	0	0	0	0	0	0	0	0	0	0.019	0	0	0	0.001	0	0.001	0.003	0	0	0	0	0	0	0.014
10	0	0.007	0	0	0.001	0.001	0.003	0	0	0	0	0.049	0.004	0.001	0.001	0.004	0.007	0.002	0.02	0	0	0.001	0.002	0	0.005	0.043
11	0	0.001	0	0	0	0	0.001	0	0	0	0	0.034	0.002	0.001	0	0.004	0.001	0.001	0.021	0	0	0	0.002	0.001	0.002	0.025
12	0	0	0	0	0	0	0	0	0	0	0	0.004	0	0	0	0	0	0	0	0	0	0	0	0	0	0.002
13	0	0	0	0	0	0	0	0	0	0	0	0.022	0	0	0	0	0.003	0	0.001	0	0	0	0	0	0.001	0.014
14	0	0	0	0	0	0	0	0	0	0	0	0.013	0.002	0	0	0	0.002	0	0	0	0	0	0	0	0.001	0.017
15	0.002	0.013	0	0.001	0	0.001	0	0	0	0	0	0.077	0.017	0.002	0	0	0.019	0.002	0.001	0.003	0	0	0	0.005	0.011	0.079
16	0	0	0	0	0	0	0	0	0	0	0	0.004	0	0	0	0	0.001	0	0	0	0	0	0	0	0	0.009
17	0	0	0	0	0	0	0	0	0	0	0	0.003	0	0	0	0	0	0	0	0	0	0	0	0	0	0.005
18	0.006	0	0	0	0	0.001	0.001	0.002	0	0	0.001	0.027	0.011	0	0	0.003	0.002	0.001	0.004	0.011	0.002	0	0.002	0.007	0.01	0.028

SUPPLEMENTARY TABLE S5. *Continued.*

N O D E	B+C+ I+R	B+ C+ I+R +S	B +C+ I+S	B+C +R	B+C + R+S	B+C +S	B+I	B+I +R	B+I +S	B+R	B+S	C	C+I	C+I+ R	C+I+ R+S	C+I+ S	C+R	C+R +S	C+S	I	I+R	I+R+ S	I+S	R	R+S	S
20	0.002	0	0	0.009	0.002	0.011	0	0	0	0	0	0.482	0.077	0.012	0	0.014	0.066	0.016	0.07	0	0.001	0	0.001	0	0.001	0.003
21	0	0	0	0.002	0	0.001	0	0	0	0	0	0.877	0.028	0.002	0	0	0.023	0.002	0.016	0	0	0	0	0	0	0
22	0	0	0	0.002	0	0.001	0	0	0	0	0	0.929	0.02	0.001	0	0	0.011	0.001	0.007	0	0	0	0	0	0	0
23	0	0	0	0.002	0	0	0	0	0	0	0	0.926	0.017	0	0	0	0.013	0	0.005	0	0	0	0	0	0	0
24	0	0	0	0.002	0	0	0	0	0	0	0	0.877	0.028	0.001	0	0	0.022	0	0.009	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0.94	0.017	0	0	0	0.011	0	0.01	0	0	0	0	0	0	0
26	0	0	0	0	0	0.001	0	0	0	0	0	0.937	0.022	0.001	0	0	0.011	0	0.009	0	0	0	0	0	0	0
27	0	0	0	0	0	0.001	0	0	0	0	0	0.965	0.01	0.001	0	0	0.006	0	0.007	0	0	0	0	0	0	0
28	0.001	0	0	0.004	0	0.001	0	0	0	0	0	0.844	0.018	0.001	0	0.001	0.021	0.002	0.065	0	0	0	0	0	0	0.001
29	0	0	0	0.001	0.004	0.022	0	0	0	0	0.001	0.483	0.049	0.003	0.005	0.02	0.045	0.022	0.185	0.001	0	0	0	0.002	0	0.006
30	0	0	0	0.002	0.002	0.011	0.001	0	0	0	0.001	0.569	0.025	0.002	0.002	0.012	0.028	0.018	0.224	0	0	0	0	0	0	0.007
31	0	0	0	0	0	0	0	0	0	0	0	0.975	0.007	0.001	0	0	0.004	0	0.007	0	0	0	0	0	0	0
32	0	0	0	0	0	0	0	0	0	0	0	0.91	0.02	0.003	0	0	0.015	0	0.011	0	0	0	0	0	0	0
33	0	0	0	0	0	0.001	0	0	0	0	0	0.922	0.012	0	0	0	0.016	0	0.014	0	0	0	0	0	0	0
34	0.004	0.001	0.001	0.006	0	0.003	0.003	0	0	0.002	0	0.557	0.077	0.011	0.001	0.003	0.066	0.002	0.018	0.003	0.002	0	0	0.004	0	0.003
35	0	0	0	0	0	0	0	0	0	0	0	0.96	0.008	0	0	0	0.007	0	0.011	0	0	0	0	0	0	0
36	0	0	0	0	0	0	0	0	0	0	0	0.985	0.003	0	0	0	0.002	0	0.002	0	0	0	0	0	0	0
37	0.001	0	0.001	0.004	0	0.006	0.005	0.002	0.001	0	0.001	0.385	0.17	0.017	0.002	0.023	0.025	0.002	0.053	0.095	0.005	0.001	0.026	0.007	0.002	0.047

## Methods S1 Study System and Geographic Sampling

*Primula* sect. *Primula* represents an ideal system to test the power of WGR to investigate sources of non-monophyly because of its distinctive biological characteristics and the wealth of available scientific resources. First, there have been extensive taxonomic studies of this clade for centuries (Linnaeus, 1753; Darwin, 1868; Smith *et al.*, 1984; Richards, 1989, 2003) culminating in the seminal monograph on *Primula* by Richards (2003). Second, the clade includes only seven species restricted to Eurasia, of which six are diploid and one is tetraploid, thus facilitating complete species and subspecies sampling and limiting analytical problems connected with extensive polyploidy. Third, a chromosome-scale reference genome is available for one species (*P. veris*; Potente *et al.* 2022) in the section, a necessity for high confidence and accuracy in calling single nucleotide polymorphisms (Fuentes-Pardo & Ruzzante, 2017). Fourth, hybridization has been amply studied in both natural populations and artificial crosses, indicating that gene flow among the three widespread species, possibly among all diploid species, is possible (Darwin, 1868; Smith & Fletcher, 1947; Valentine, 1947, 1961; Woodell, 1969; Kálmán *et al.*, 2004; Keller *et al.*, 2016, 2021; Tendal *et al.*, 2018). Finally, although *Primula* sect. *Primula* is distributed throughout Eurasia, the highest species diversity occurs in the Caucasus (Richards 2003), a remarkable biodiversity hotspot that is ranked as one of the most diverse and endangered ecoregions in the world (Mittermeier *et al.*, 2011).

Targeted fieldwork was conducted in 2018 to collect accessions covering the taxonomic and geographic diversity of *Primula* sect. *Primula* (Fig. 1A,B). All ingroup samples were collected in the field except for *P. renifolia*. Every currently recognized species and subspecies of *Primula* sect. *Primula* (following Richards 2003) was obtained from at least one population, while from every population we collected two individuals (Table S1). For most populations of the heterostylous taxa, we collected one S-morph and one L-morph plant. Multiple, geographically distinct populations of subspecies were sampled to capture morphological and molecular variation for *P. elatior*, *P. veris*, *P. vulgaris*, and *P. grandis* (Fig. 1; Table S1). Due to the limited distribution of *P. juliae* and *P. megaseifolia*, only one population was sampled for these species. Samples of *P. renifolia* were acquired from the Gothenberg Botanical Garden; these plants were originally obtained from their native range in the Caucasus region of Russia (collection number NCE230-1). Additionally, eight outgroup accessions used in previous phylogenetic analyses (Schmidt-Lebuhn *et al.*, 2012; de Vos *et al.*, 2014) were obtained from the

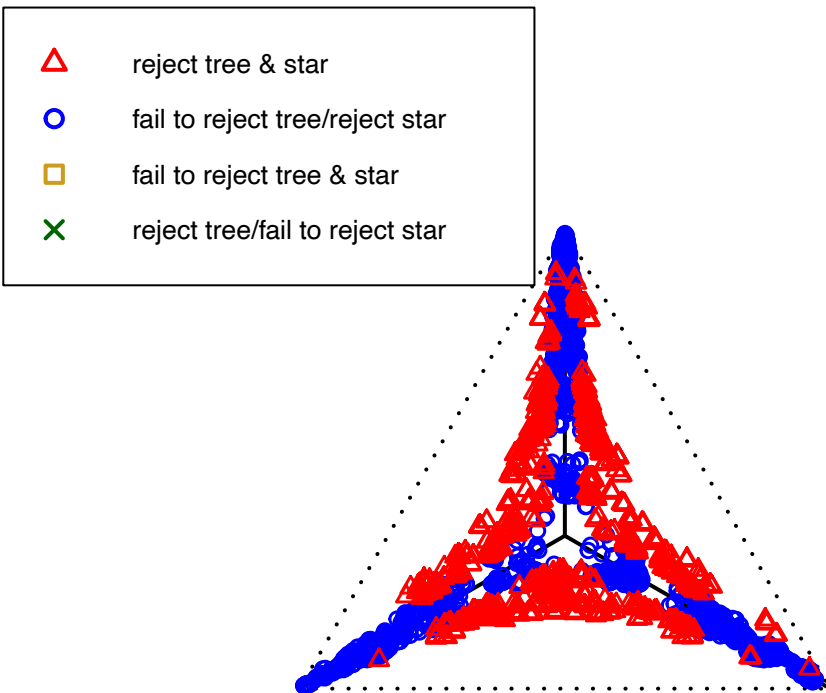
University of Zurich frozen tissue collection (Supplementary Table S1). This resulted in 98 ingroup and eight outgroup samples, totaling 106 specimens. All tissue was silica dried and herbarium accessions from every population were deposited at either Z, TBI, or ADO.

## **Methods S2** Species networks estimation with NANUQ

Species networks were estimated using the NANUQ algorithm as implemented in the R package MSCquartets (Allman *et al.*, 2019). NANUQ is based on an analysis of gene tree quartets, combining several statistical tests including quartet-based between-species distances appropriate to networks and splits graphs. Unlike pseudo-likelihood methods, NANUQ does not require the user to set an arbitrary limit on the number of hybridization events in the network. We tested multiple values of alpha and beta, as recommended by the authors, with the goal of testing for a signal of network cycles in the quartets (not shown). We selected an alpha of  $5e-11$  to impose a high standard for evidence of hybridization and a beta of 0.05, which requires stronger evidence for any resolution of the 4-taxon network. The NANUQ quartet hypothesis test showed that the selected alpha and beta were a good fit to our data because the quartet counts concordance factors (qcCFs) that are clustered close to the three-line segments in the simplex plot were recovered as being tree-like (Supporting Information Fig. A). In concordance, many of the qcCFs that were not close to three-line segments reject tree-like models and instead are in support of a network model (Supporting Information Fig. A), thus justifying a hybridization network (Allman *et al.*, 2019).

## Quartet Hypothesis Test

NANUQ,  $\alpha=5e-11$ ,  $\beta=0.05$



**Fig. A.** Simplex plot of NANUQ's quartet hypothesis test. The NANUQ quartet hypothesis test determines whether to view the quartet counts concordance factors (qcCF) as supporting (1) a star tree, (2) a resolved tree, or (3) a 4-cycle network. The results of the hypothesis tests suggest that the qcCFs close to the three-line segments are classified as tree-like (blue circles), and those farther away which were viewed as supporting a 4-cycle network (red triangles). Thus, the selected alpha ( $5e-11$ ) and beta (0.05) are a good fit to our data because the qcCFs that are clustered close to the three-line segments in the simplex plot, which represent the true tree, are recovered as being tree-like.

### Methods S3 Supplementary D-statistic analyses and information

We used  $D_{\text{FOIL}}$  (Pease & Hahn, 2015) to confirm admixture events identified using the Fb statistic.  $D_{\text{FOIL}}$  is similar to D-statistics except that it employs 5-taxon (quintet) trees consisting of  $((P1,P2),(P3,P4)),O$  rather than quartets.  $D_{\text{FOIL}}$  has been shown to accurately detect ancestral introgression events and exhibits exceptionally low false-positive rates (Pease & Hahn, 2015; Suvorov *et al.*, 2022). One caveat of  $D_{\text{FOIL}}$  is that it requires that the divergence time of (P3,P4) to diverge earlier in time than (P1,P2). Therefore, we selected the order of each quintet based on the chronogram in Supplementary Figure 6. Analogous to Dsuite, we applied  $D_{\text{FOIL}}$  to the entire genomic data set.

Introgression from a ghost lineage can significantly impact D-statistics, including the f4-ratio and Fbranch. Following the methods of Hibbins and Hahn (2021), we used the D-statistics generated from Dsuite for the entire genome (Supporting Information Table S4) to investigate the potential of ghost lineages having impacted our results. We focused on the two introgression events identified in Dsuite as having the highest Fb (Fig. 4). If one considers a quartet of  $[(P1,P2),P3],O$ , we can swap out the P1 for different, closely related species (hereafter referred to as P1-1 and P1-2). If P1-1 is the recipient of introgression from a ghost lineage this would result in P1-1 and P2 being sister taxa, and the incorrect inference of introgression between P2 and P3. In contrast, when running the same analysis with P1-2 (which has not received introgression from a ghost lineage) P1 and P2 will still be recovered as sister taxa, and we will not infer introgression between P2 and P3. Therefore, examined species quartets where P1 was either *P. megaseifolia*, *P. el. elatior*, *P. el. meyeri* GE, *P. el. meyeri* TR, or *P. renifolia* (corresponding to the introgression event identified in Fig. 4 letter A) and for *P. el. pseudoelatior*, *P. ve. macrocalyx*, or *P. ve. columnae* TR (corresponding to the introgression event identified in Fig. 4 letter B). We compared D-statistics, Z-scores, and p-values for these quartets. For any quartet with a significant D-statistic, we then examined if P2 and P3 had significant D-statistics if we swapped out another species (excluding those already identified as introgressed i.e., the other species in Fig. 4 A and B) for the target P1. In every case, multiple species (>4) exchanged for the target P1 resulted in significant D-statistics (Supporting Information Table S4). For further information, see Hibbins and Hahn (2021).

### Methods S4 Ancestral Range Estimation

Methods used to reconstruct ancestral character states and ranges integrate information from branch lengths during the inference. Branch lengths can be specified in either units of time (chronograms) or units of molecular divergence (phylograms) (Litsios & Salamin, 2012; Matzke, 2013). Given that no fossil calibration points are available within our sampled taxa, we employed two methods to recover the ancestral range of this clade without a fossil-dated phylogeny. By using two methods, one employing a phylogram and the other employing a chronogram with relative dating, we can compare and contrast the results of each analysis to address the biogeographical patterns of *Primula* sect. *Primula*. In addition to conducting an ARE using a phylogram, we investigated if ARE with a time-tree recovered similar ancestral ranges as those run with a phylogram. To do this, we created an ultrametric tree through relative dating by putting a tight normal prior on the root of *Primula* sect. *Primula*. Specifically, we used the least square dating (LSD2) method implemented in IQ-tree, which incorporate the possibility of rate variation from branch to branch (To *et al.*, 2016). Dating is performed in three steps: 1) the best-fitting model is selected using ModelFinder, 2) the ML tree with branch lengths in number of substitutions per site is constructed, and 3) the branch lengths of the ML tree are rescaled, with rates varying from branch to branch, to build a time tree with a dated ancestral node. We set the root age to 10 with a standard deviation of 0.01. The output includes estimates of the substitution rate, the root date, and the dates of all internal tree nodes. This tree was used in ARE analyses identical to those employed for the phylogram, and the best model was also identified by the AIC as the transient model. All nodes recovered the Caucasus as the range with the highest probability.

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