Supplementary Material (Appendix V)

"Phylogenetic incongruences derail the identification of correlates of diversification in *Gentiana* in the European Alpine System"– **Alpine Botany**

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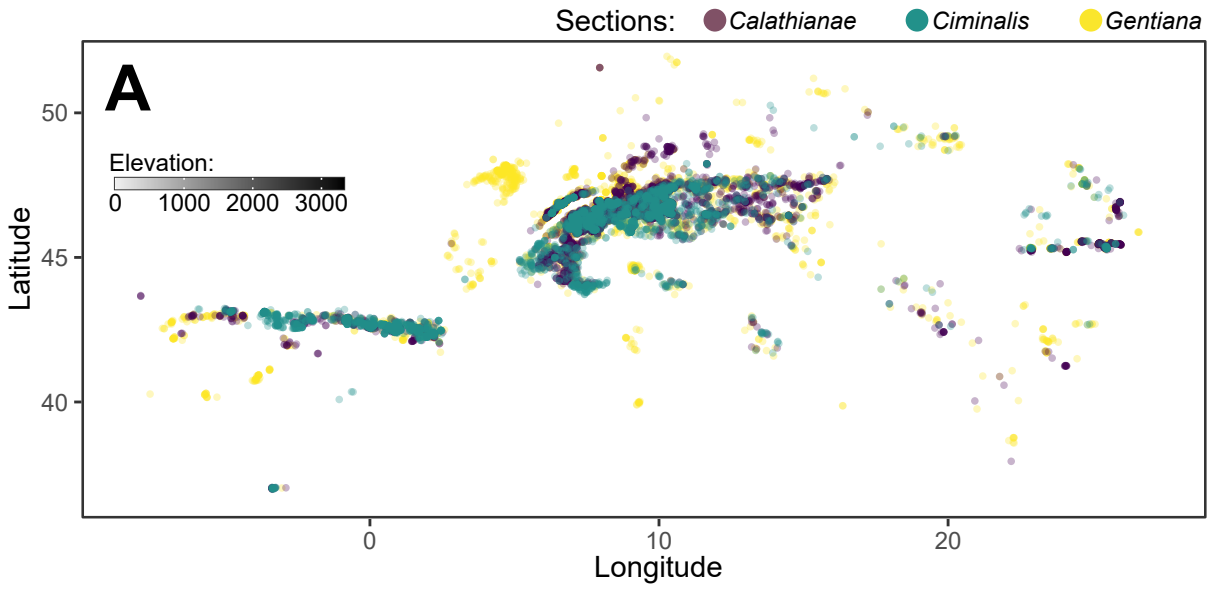
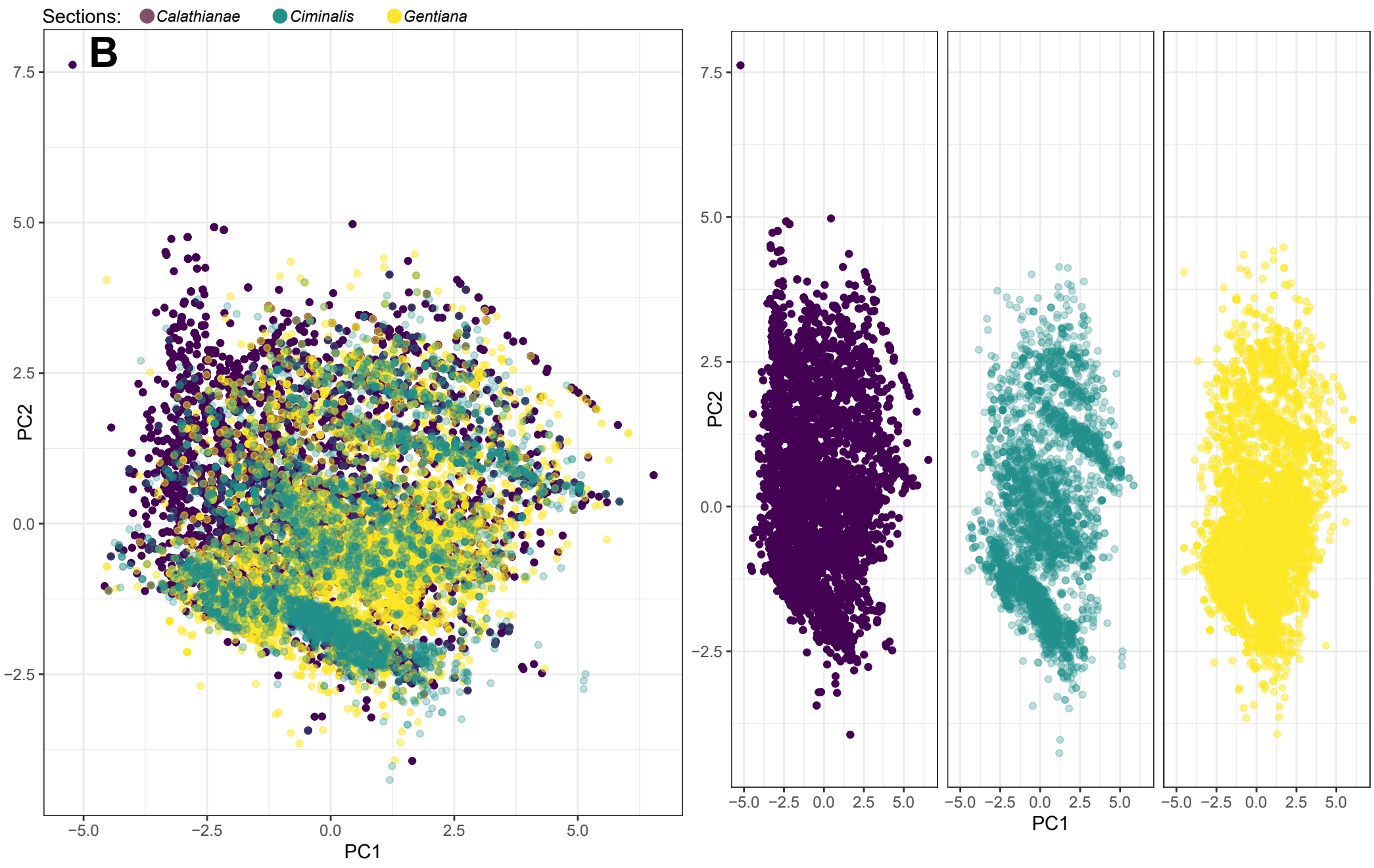
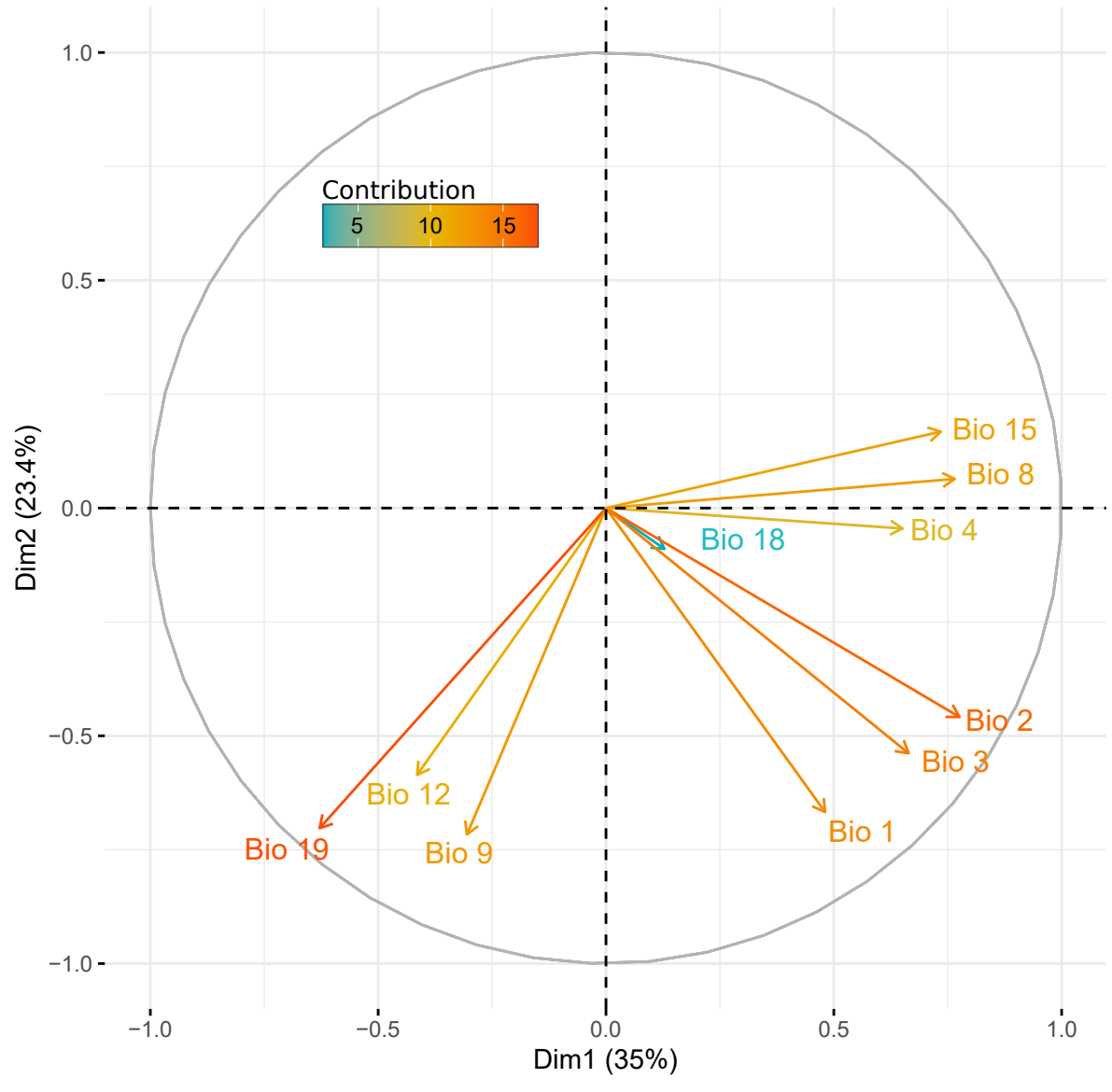




Appendix Va. Comparison of climatic niches of species of three *Gentiana* sections occurring in the European Alpine System. **A.** Distribution map based on occurrence data. **B.** Principal component analysis highlighting *G.* section *Calathianae*, *G.* sect. *Ciminalis* and *G.* sect. *Gentiana* plotted together and separately (C.), based on nine selected WorldClim bioclimatic variables

Note: Incongruences do not affect comparions among sections

Geographic overlap:
Calathianae - Ciminalis: 0.65, *Ciminalis - Gentiana*: 0.68
Gentiana - Calathianae: 0.71



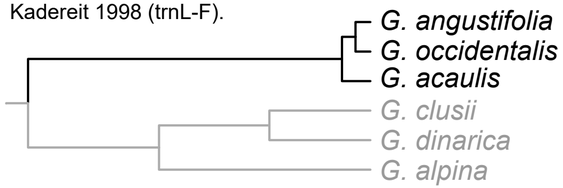
Wordclim Variables

Bio 19 Precipitation of Coldest Quarter
Bio 2 Mean Diurnal Range
Bio 3 Isothermality
Bio 1 Annual Mean Temperature
Bio 9 Mean Temperature of Driest Quarter
Bio 8 Mean Temperature of Wettest Quarter
Bio 12 Annual Precipitation
Bio 4 Temperature Seasonality
Bio 18 Precipitation of Warmest Quarter

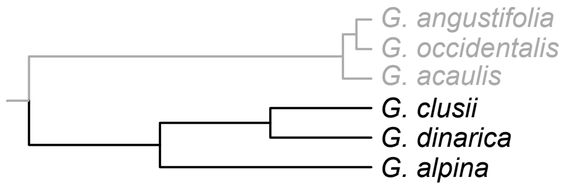
Appendix Vb. Comparison of climatic niches among species of *G.* sect. *Ciminalis* occurring in the European Alpine System. **A.** Comparison among all species. **B.** and **C.** Comparison among species within each main clade. Principal component analysis based on worldclim climate variables.

Note: In *G.* sect. *Ciminalis*, phylogenetic incongruences occur and thus, we present here comparisons based on both plastid and rDNA-cistron phylogenies

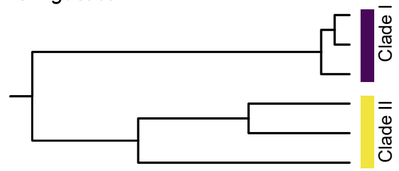
Phylogenetic relationships: plastid tree
We do not include *G. ligustica* in our phylogenetic reconstructions, but we show it here because this species clusters with the clade of *G. acaulis* in Hungerer & Kadereit 1998 (trnL-F).



Phylogenetic relationships: plastid tree
Although *G. ligustica* appears to cluster close to *G. acaulis* in Hungerer & Kadereit 1998 (with ITS), support values were weak and thus we include *G. ligustica* here as well.

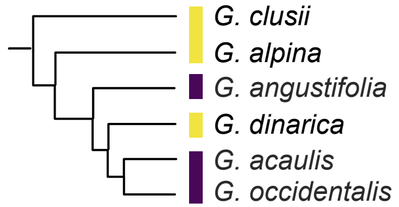


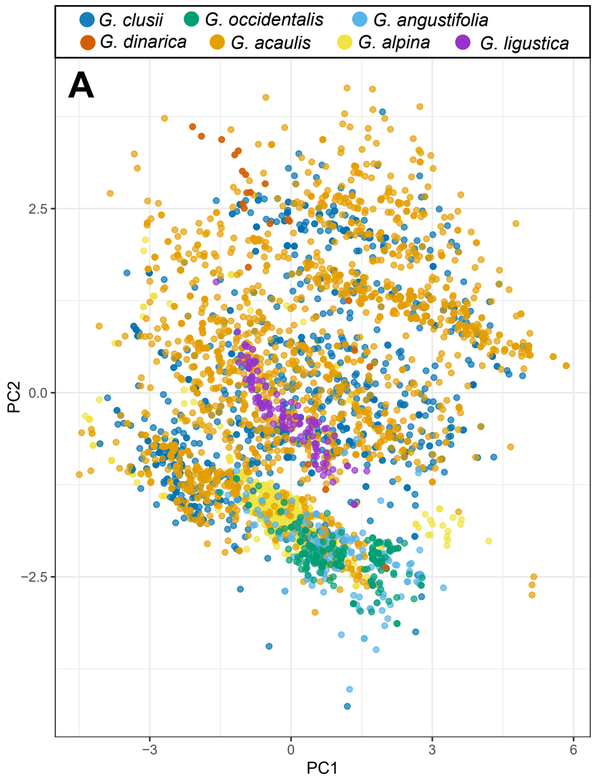
Phylogenetic relationships: plastid tree
Comparison of clade I and II, without *G. ligustica*.

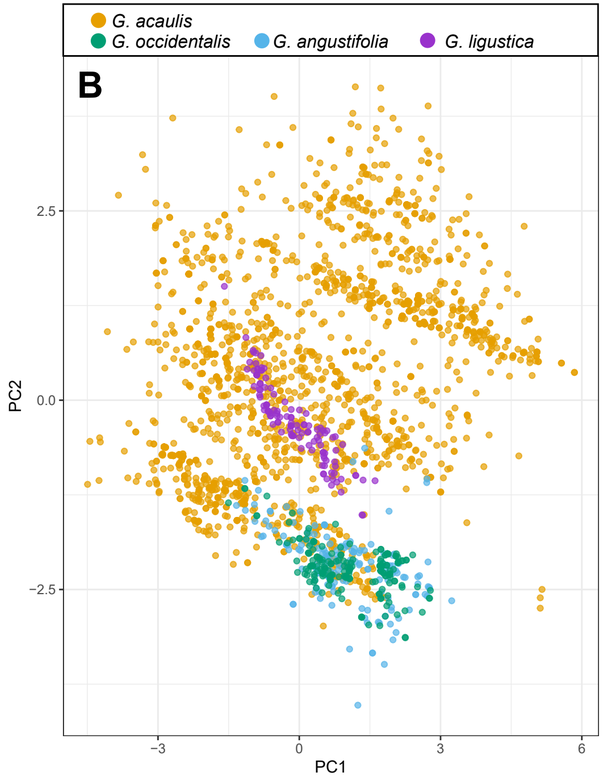


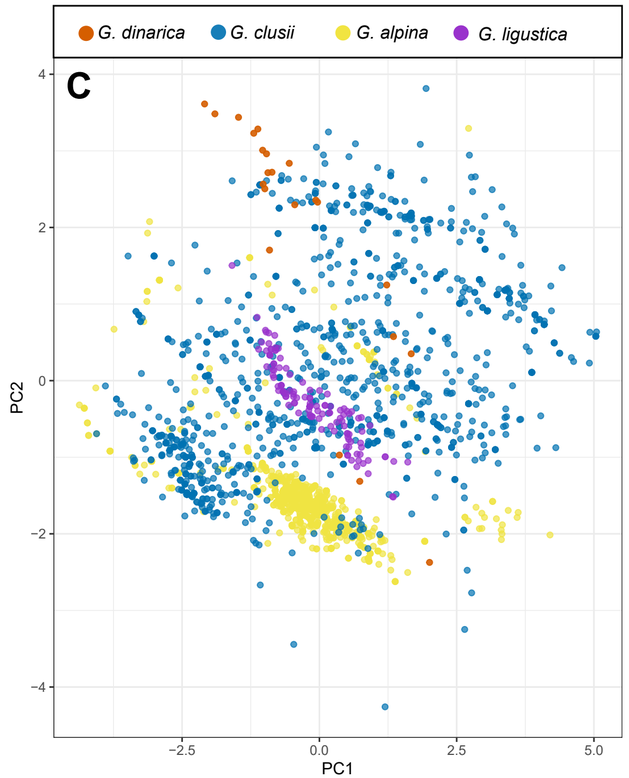
Geographical overlap:
Cp tree, Clade I and II: 0.58

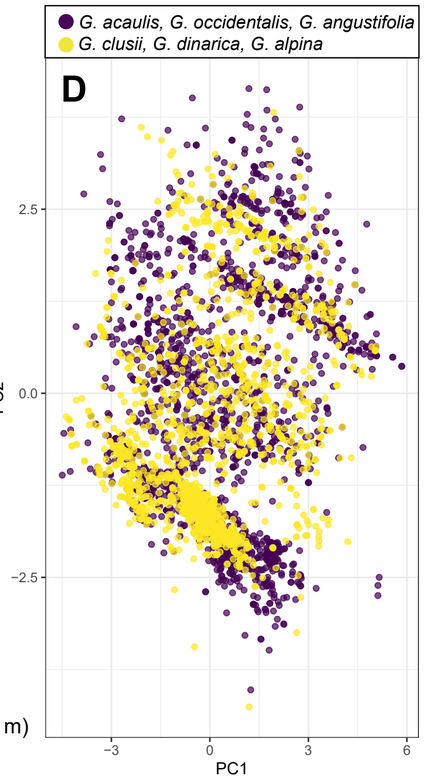
Phylogenetic relationships: rDNA-Cistron
Comparison of clade I and II, without *G. ligustica*. Purple is Clade I, yellow is Clade II.

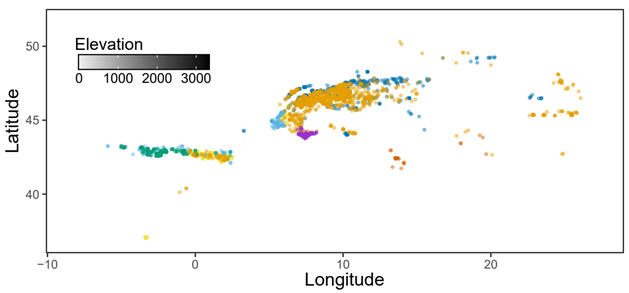


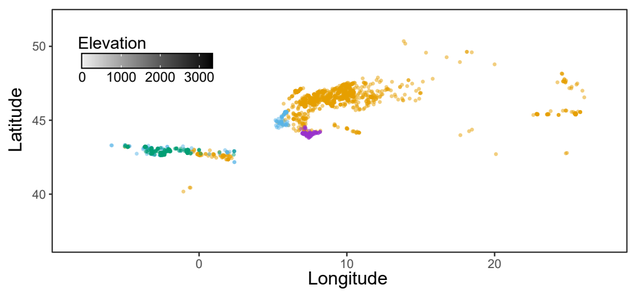


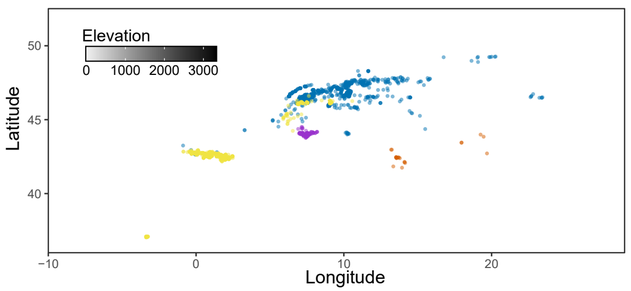








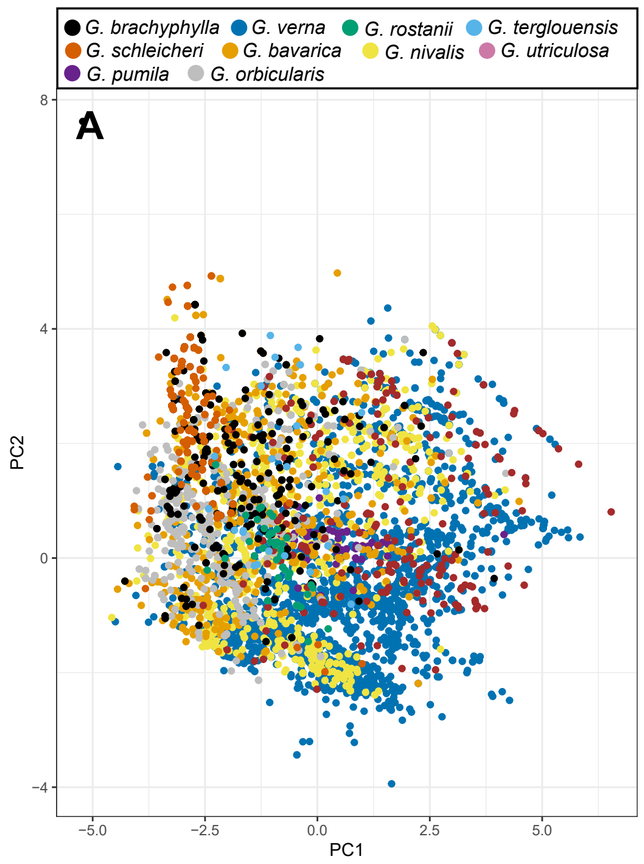




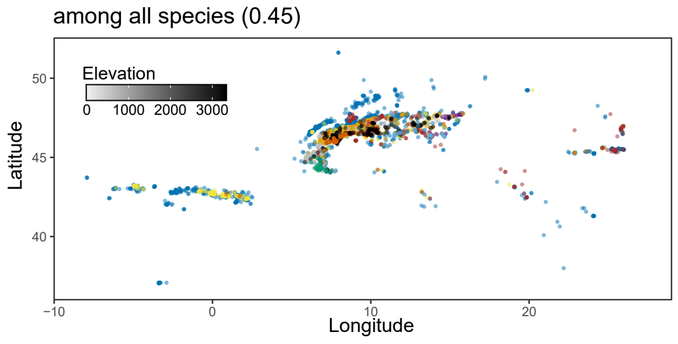
Species mean elevation:
G. acaulis (1793 +/- 493m), *G. alpina* (2094 +/- 315 m), *G. angustifolia* (977 +/- 350 m), *G. clusii* (1575 +/- 530 m), *G. dinarica* (1488 +/- 292 m), *G. ligustica* (1398 +/- 466 m), *G. occidentalis* (1013 +/- 308 m)

Appendix Vd. Comparison of climatic niches among species of *G*. sect. *Calathianae* occurring in the European Alpine System. **A.** Comparison among all species. **B. to F.** Comparison among selected species. Principal component analysis based on worldclim climate variables.

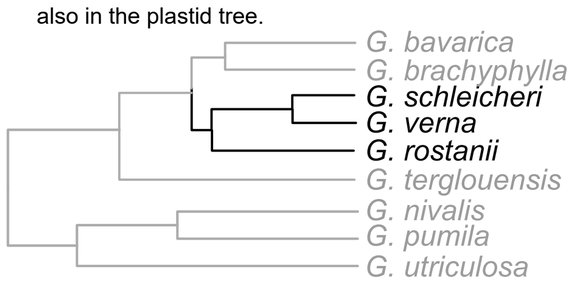
Note: In *G*. sect. *Calathianae*, phylogenetic incongruences occur and thus, we present here comparisons based on both plastid and rDNA-cistron phylogenies

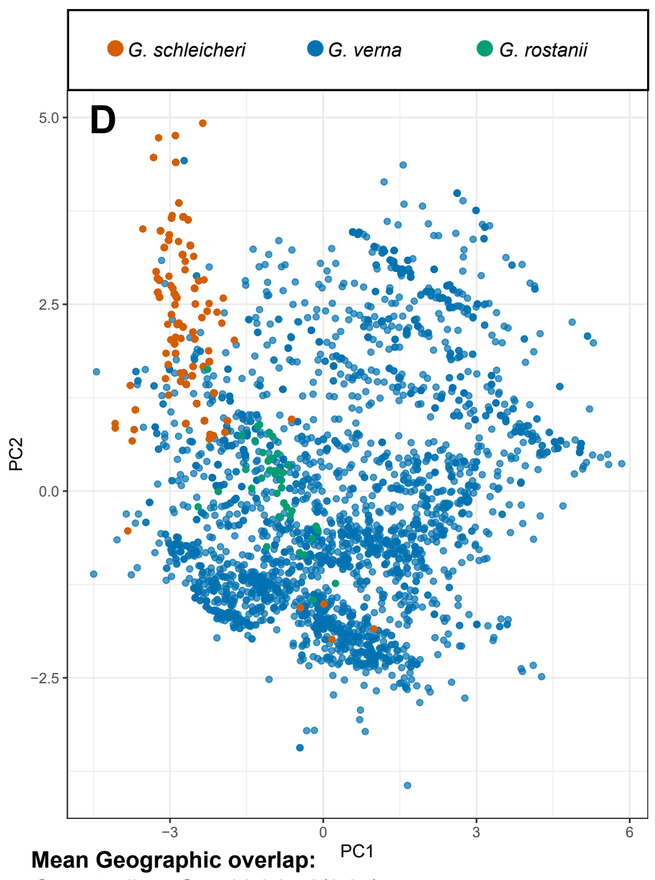


Mean Geographic overlap:
among all species (0.45)

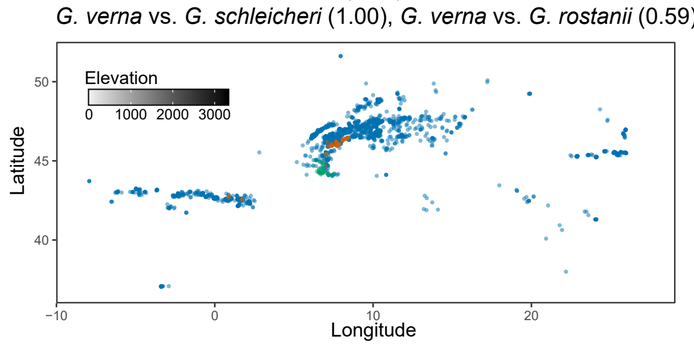


Phylogenetic relationships: rDNA-cistron tree
Note: *G. schleicheri* and *G. verna* are sister species also in the plastid tree.

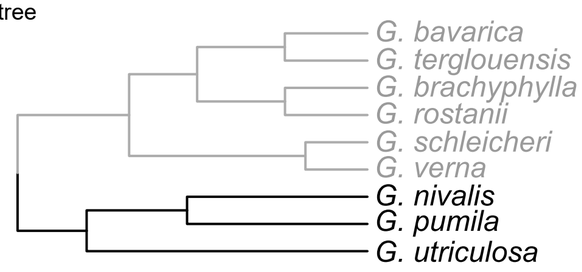


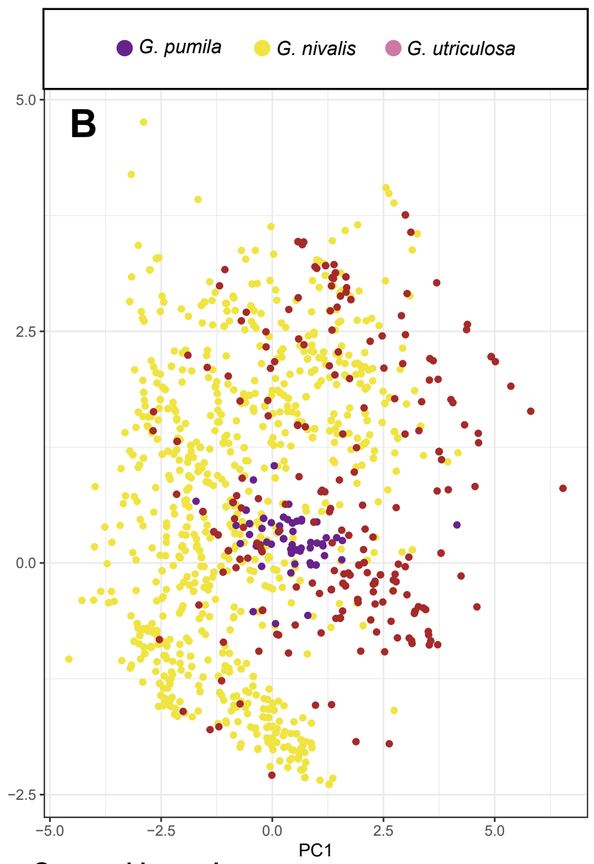


Mean Geographic overlap:
G. rostanii vs. *G. schleicheri* (0.07),
G. verna vs. *G. schleicheri* (1.00), *G. verna* vs. *G. rostanii* (0.59)

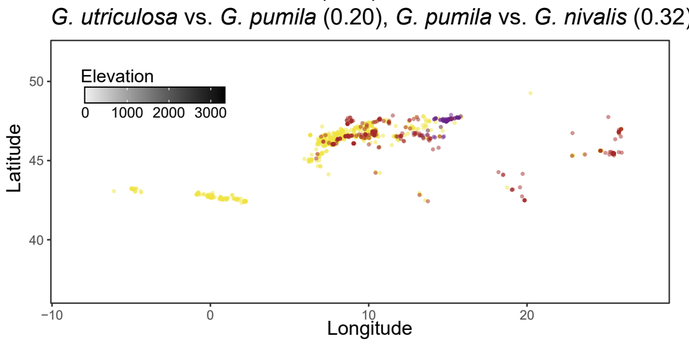


Phylogenetic relationships: plastid tree
Note: phylogenetic relationships among *G. nivalis*, *G. utriculosa* and *G. pumila* are the same in the rDNA-cistron tree

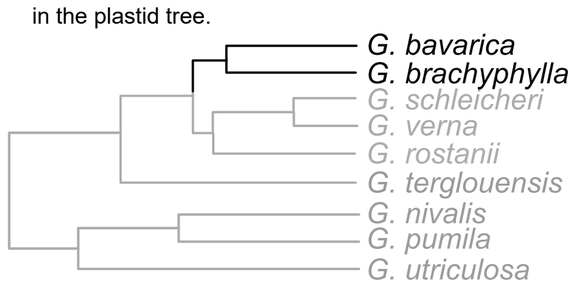


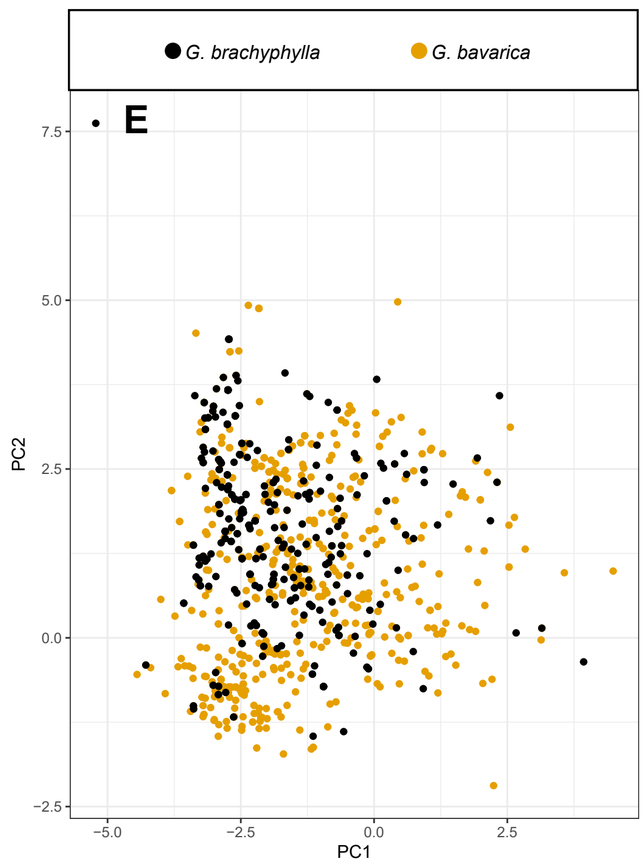


Mean Geographic overlap:
G. utriculosa vs. *G. nivalis* (0.48),
G. utriculosa vs. *G. pumila* (0.20), *G. pumila* vs. *G. nivalis* (0.32)

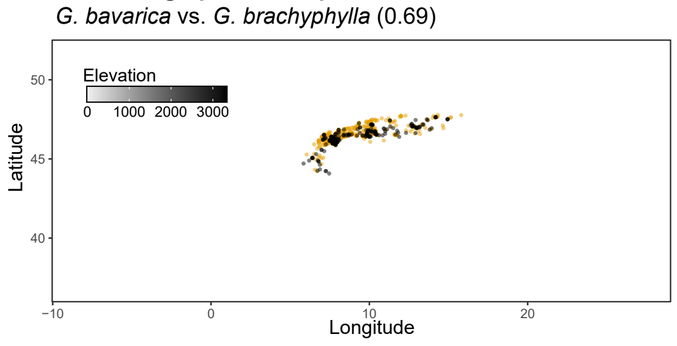


Phylogenetic relationships: rDNA-cistron tree
Note: *G. terglouensis* is the sister species of *G. bavarica* in the plastid tree.

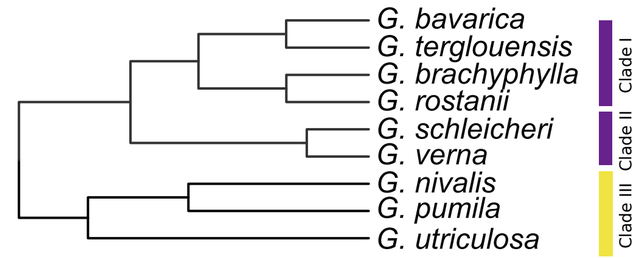


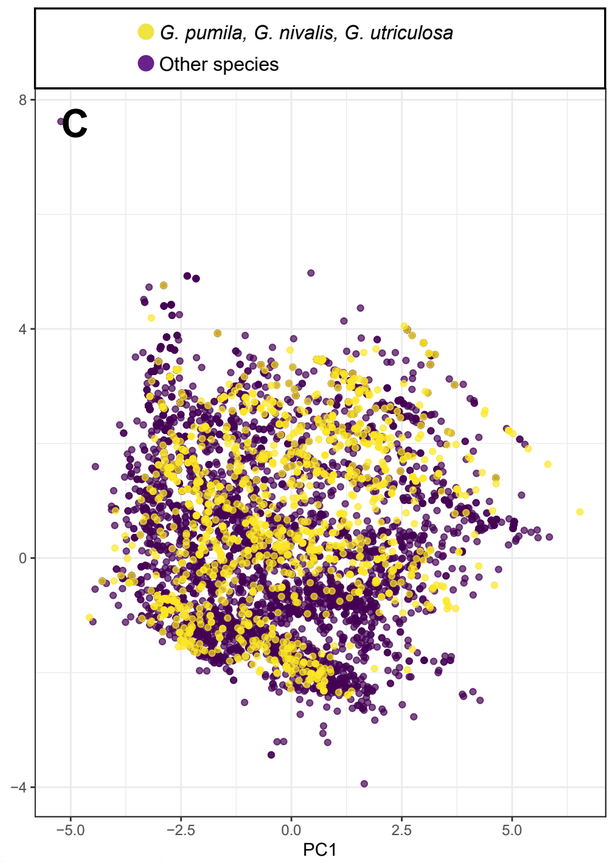


Mean Geographic overlap:
G. bavarica vs. *G. brachyphylla* (0.69)

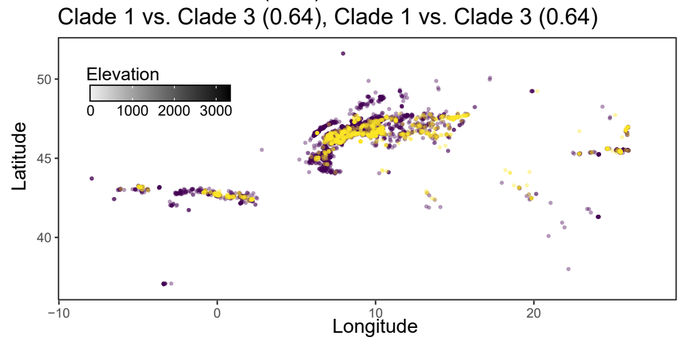


Phylogenetic relationships: plastid tree
Note: Clade I and Clade II are also monophyletic in the rDNA-cistron tree.

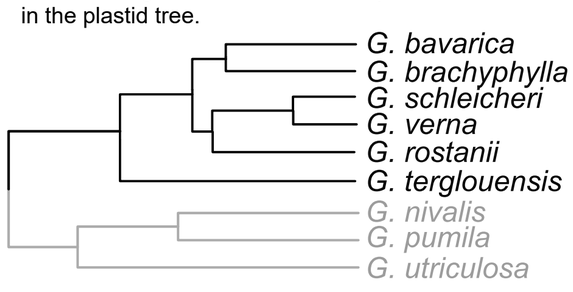




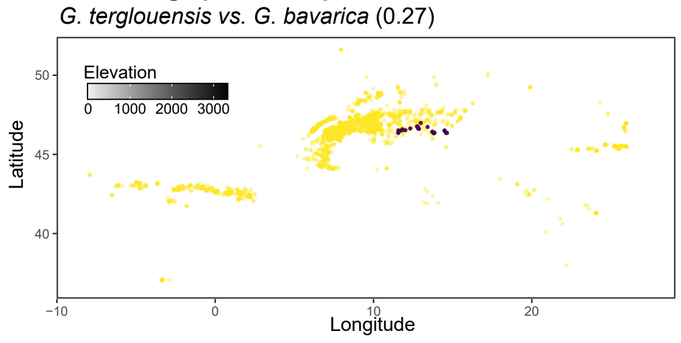
Mean Geographic overlap:
Clade 1 vs. Clade 2 (0.73),
Clade 1 vs. Clade 3 (0.64), Clade 1 vs. Clade 3 (0.64)



Phylogenetic relationships: rDNA-cistron tree
Note: *G. terglouensis* is the sister species of *G. bavarica* in the plastid tree.



Mean Geographic overlap:
G. terglouensis vs. G. bavarica (0.27)

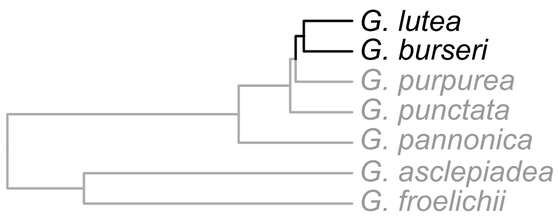


Species mean elevation:
G. bavarica (2100 +/- 468 m), *G. brachyphylla* (2333 +/- 406 m), *G. nivalis* (2022 +/- 461 m), *G. orbicularis* (2194 +/- 405 m), *G. pumila* (1328 +/- 177 m), *G. rostanii* (2161 +/- 198 m), *G. schleicheri* (2648 +/- 310 m), *G. terglouensis* (1651 +/- 383 m), *G. utriculosa* (1567 +/- 589 m), *G. verna* (1586 +/- 593 m)

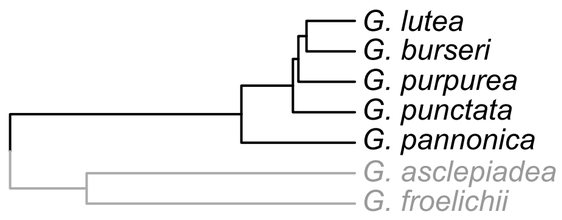
Appendix Vd. Comparison of climatic niches among species of *G.* sect. *Gentiana* occurring in the European Alpine System. **A.** Comparison among all species. **B. to D.** Comparison among species within each main clade. **E. and F.** comparisons among silicolous species and between silicolous and calcicolous species. Silicolous species cluster together only in the rDNA-cistron tree. Principal component analysis based on worldclim climate variables.

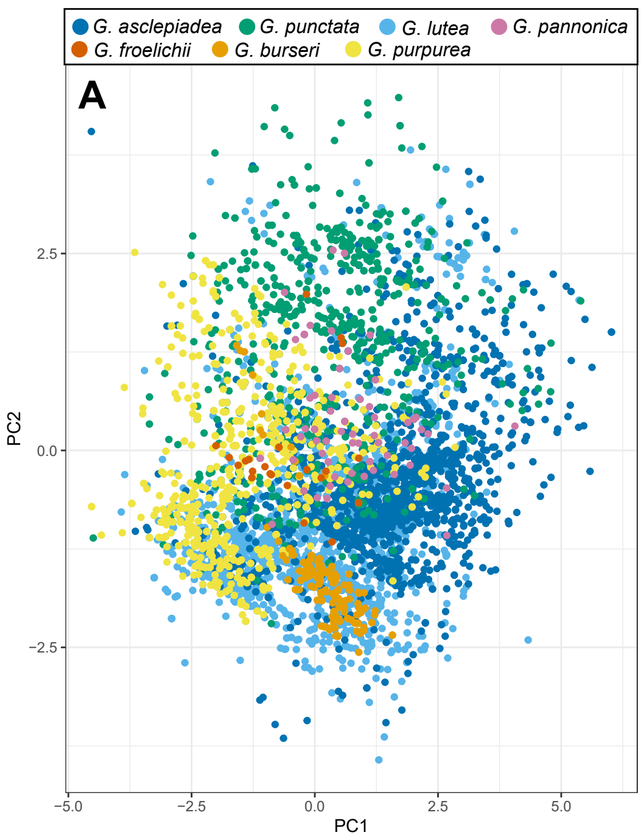
Note: In *G.* sect. *Gentiana*, phylogenetic incongruences occur and thus, we present here comparisons based on both plastid and rDNA-cistron phylogenies

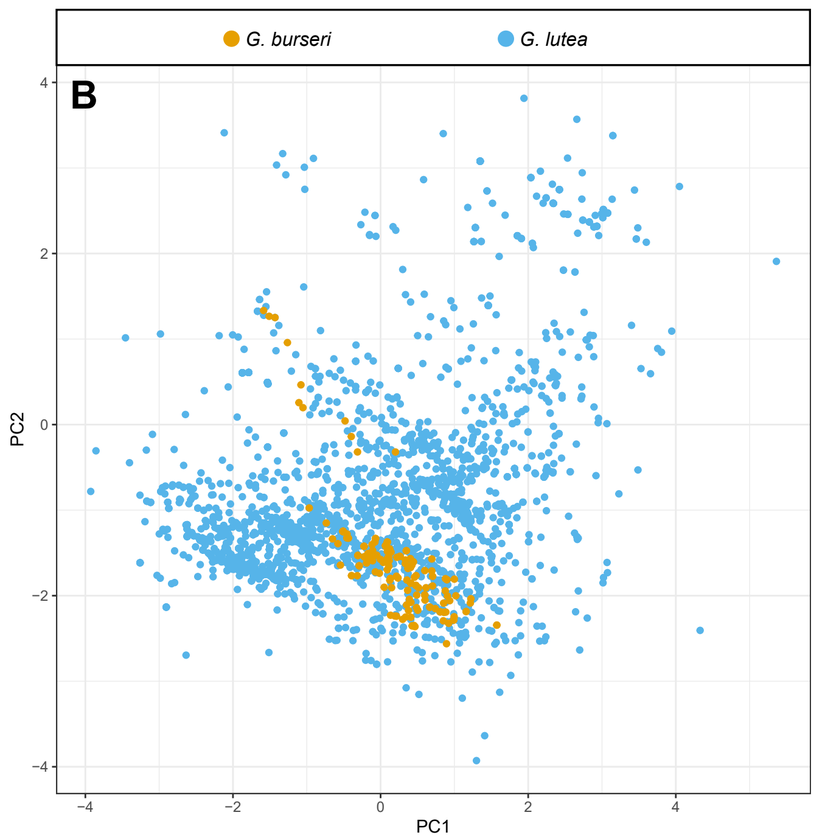
Phylogenetic relationships: plastid tree

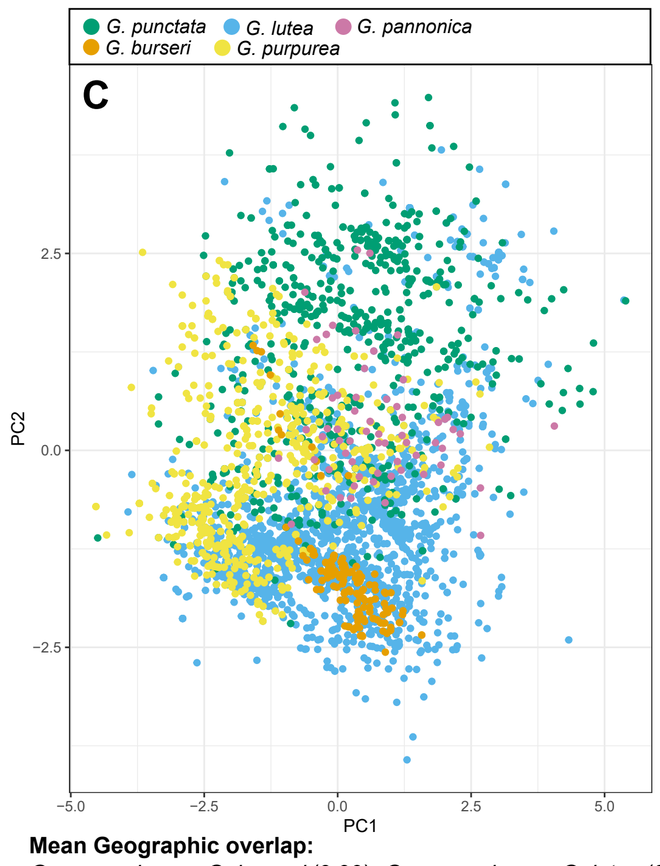


Phylogenetic relationships: plastid tree

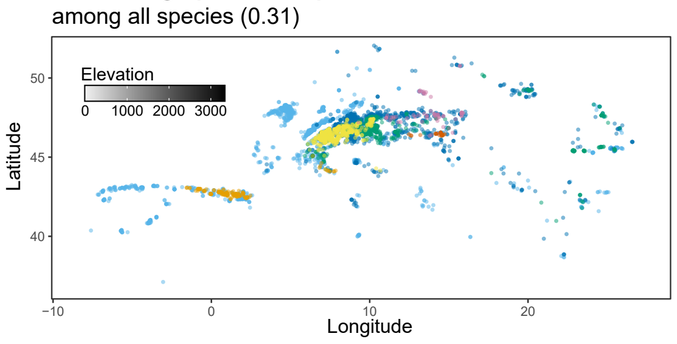




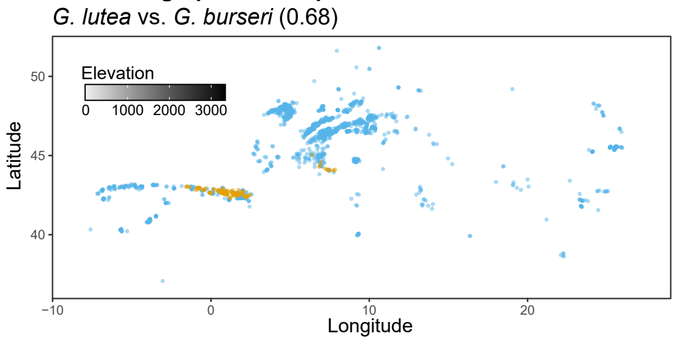




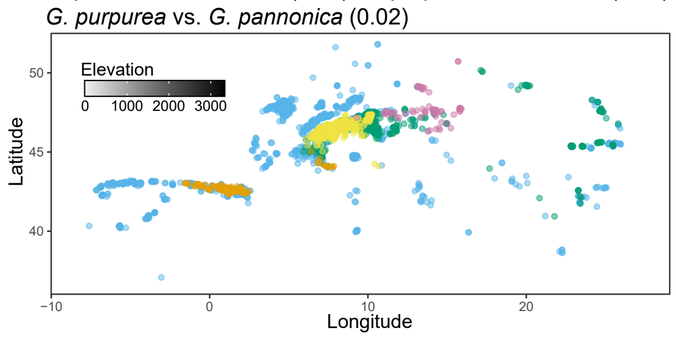
Mean Geographic overlap:
among all species (0.31)



Mean Geographic overlap:
G. lutea vs. *G. burseri* (0.68)



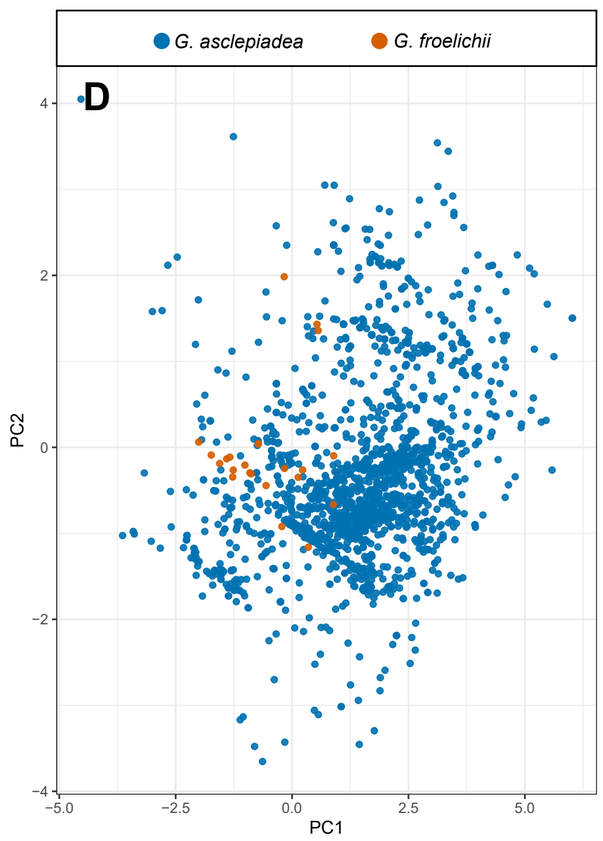
Mean Geographic overlap:
G. pannonica vs. *G. burseri* (0.00), *G. pannonica* vs. *G. lutea* (0.23), *G. punctata* vs. *G. lutea* (0.50), *G. purpurea* vs. *G. lutea* (0.64), *G. purpurea* vs. *G. pannonica* (0.02)

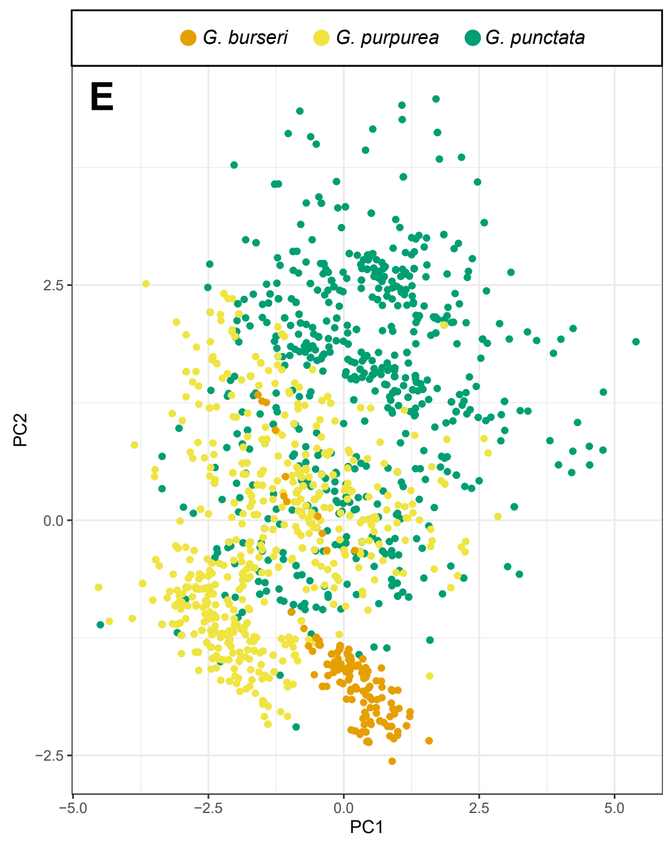


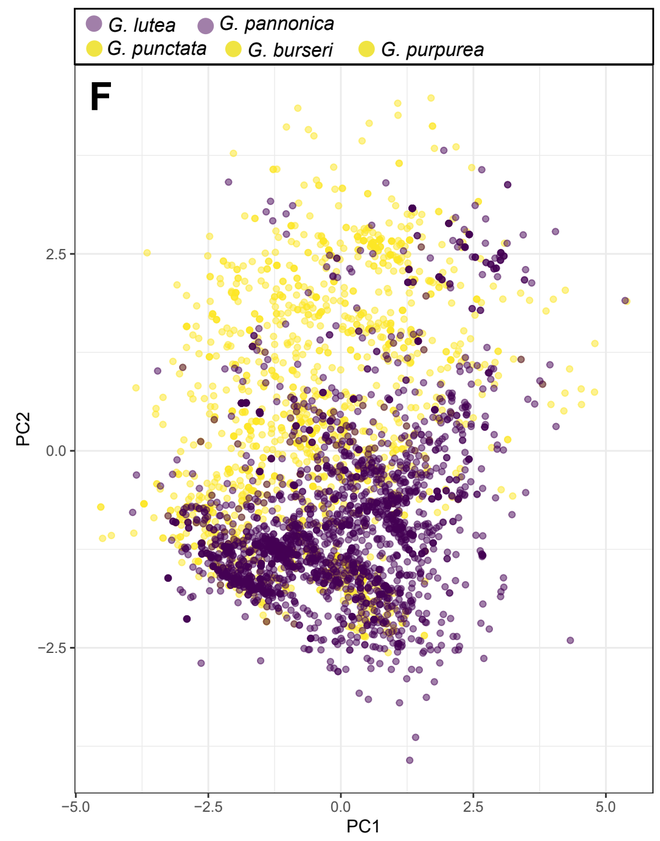
Phylogenetic relationships: plastid tree

Phylogenetic relationships: rDNA-cistron tree
Comparison among silicolous species

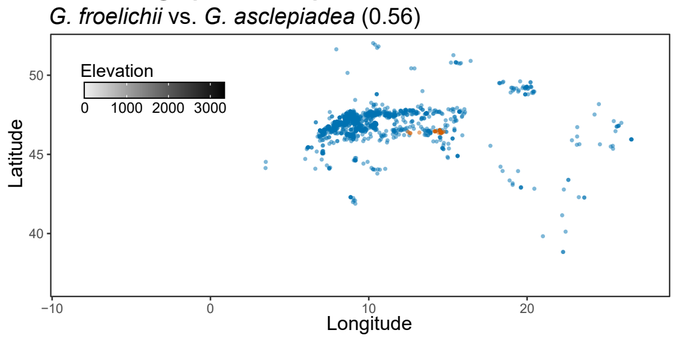
Phylogenetic relationships: rDNA-cistron tree
Comparison between calcicolous and silicolous species



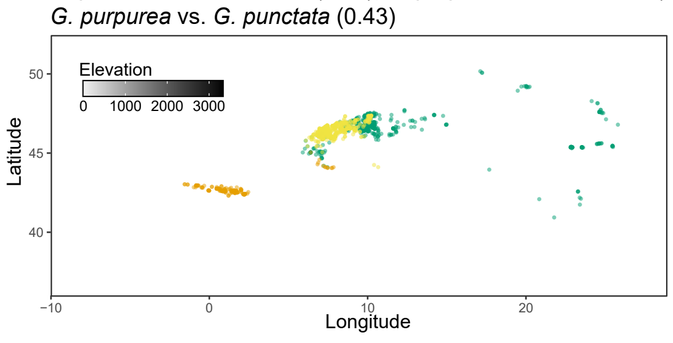


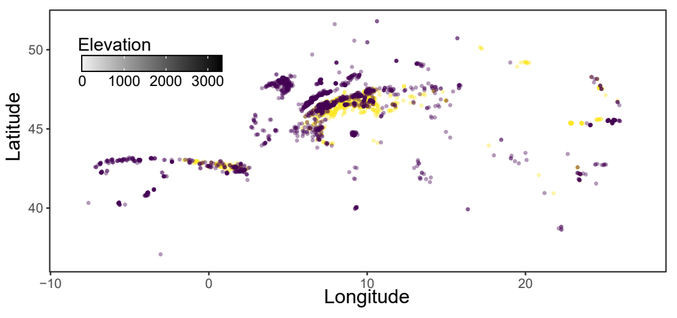


Mean Geographic overlap:
G. froelichii vs. *G. asclepiadea* (0.56)



Mean Geographic overlap:
G. punctata vs. *G. burseri* (0.05), *G. purpurea* vs. *G. burseri* (0.00), *G. purpurea* vs. *G. punctata* (0.43)





Species mean elevation:
G. asclepiadea (1162 +/- 543 m), *G. burseri* (1956 +/- 367 m), *G. froelichii* (1269 +/- 236 m), *G. lutea* (1277 +/- 531 m), *G. pannonica* (1273 +/- 299 m), *G. punctata* (1987 +/- 423 m), *G. purpurea* (1783 +/- 453 m)

***Gentiana froelichii*:** six additional locations were created for this species near known occurrences. These are listed below.
1. Slovenia, SE of summit of Visoki vrh, lat.: 46.3549111, long.: 14.5266000, elev.: 1956 m. **2.** Slovenia, Between Planjava and Kroficka, lat.: 46.3559972, long.: 14.6155750, elev.: 2260 m
3. Slovenia, SW of summit of Velika Baba, lat.: 46.3603694, long.: 14.5520306, elev.: 2170 m. **4.** Slovenia, E of summit of Mt Plece, lat.: 46.4350528, long.: 14.1801667, elev.: 2010 m
5. Slovenia, SE of Mt Vajnež, lat.: 46.4378861, long.: 14.1516111, elev.: 1980 m. **6.** Slovenia, E of Mt Palec, lat.: 46.4395833, long.: 14.2230861, elev.: 1850 m.

Appendix Ve: Complement to Table 4, including all sister and closely related species comparison of climatic preferences, elevational ranges and geographic distribution ranges between and within three European *Gentiana* sections based on their occurrences in the European Alpine System. Extant climatic preferences of nine bioclimatic variables are summarized via the first two principal components (PC1, PC2). Significance levels: *<0.05, **<0.01, ***<0.001. Geographic overlap is given as the proportion of the smaller range contained in the larger range for each comparison. *Gentiana ligustica* was included in section and clade-wise comparisons (in *G.* sect. *Ciminalis* clade 1).

	Trees		**Mean variable differences**						**Geo.**
Section-wise comparison	**rDNA**	**Plast.**	**PC1**		**PC2**		**Elev. (m)**		**overlap**
G. sect. *Ciminalis* vs. *G.* sect. *Calathianae*	yes	yes	0.740	0.000	0.849	0.000	140.0	0.0	0.65
G. sect. *Gentiana* vs. *G.* sect. *Calathianae*	yes	yes	0.882	0.000	0.902	0.000	472.5	0.0	0.72
G. sect. *Gentiana* vs. *G.* sect. *Ciminalis*	yes	yes	0.141	0.000	0.053	0.153	332.5	0.0	0.68
Intrasectional deep splits									
G. sect. *Calathianae*: clade 1 vs. clade2	no	yes	1.195	0.000	0.683	0.000	419.2	4E-09	0.73
G. sect. *Calathianae*: clade 1 vs. clade3	no	no	2.180	0.000	0.274	0.008	530.8	4E-09	0.64
G. sect. *Calathianae*: clade 2 vs. clade3	no	no	0.985	0.000	0.409	0.000	111.6	3E-03	0.64
G. sect. *Calathianae*: clade 1 vs. (clade2, clade3)	no	yes	0.300	0.000	0.189	0.000	81.2	3E-05	0.79
G. sect. *Calathianae*: clade 1 vs. clade2 *rDNA*	yes	no	1.626	0.000	-0.848	0.000	479.8	3E-12	0.76
G. sect. *Calathianae*: clade 1 vs. clade3 *rDNA*	yes	no	1.576	0.000	-0.412	0.000	292.5	3E-12	0.68
G. sect. *Calathianae*: clade 2 vs. clade3 *rDNA*	yes	no	0.050	0.691	0.436	0.000	187.2	3E-12	0.72
G. sect. *Calathianae*: *G. terglouensis* vs. (clade 1, clade2) rDNA	yes	no	1.576	0.000	-0.412	0.000	292.5	3E-12	0.68
G. sect. *Calathianae*: clade 3 vs. (clade 1, clade2, *G. terglouensis*) rDNA	yes	no	0.050	0.691	0.436	0.000	187.2	3E-12	0.72
G. sect. *Gentiana*: clade 1 vs. clade2	no	yes	1.670	0.000	0.000	1.000	358.2	3E-08	0.49
G. sect. *Ciminalis*: clade 1 vs. clade2	no	yes	0.426	0.000	0.496	0.000	158.1	4E-09	0.58
Sister and closely related species relationships, recent splits									
G.* sect. *Calathianae									
G. terglouensis vs. *G. bavarica*	no	yes	0.706	0.911	0.275	1.000	448.5	4E-03	0.27
G. rostanii vs. *G. brachyphylla*	no	yes	0.951	0.067	1.603	0.000	172.4	9E-01	0.41
G. verna vs. *G. schleicheri*	yes	yes	2.949	0.000	2.538	0.000	1062.4	3E-08	1
G. pumila vs. *G. nivalis*	yes	yes	1.022	0.000	0.449	0.391	694.0	3E-08	0.32
G. utriculosa vs. *G. nivalis*	yes	yes	2.076	0.000	0.107	1.000	455.1	3E-08	0.48
G. utriculosa vs. *G. pumila*	yes	yes	1.054	0.000	0.556	0.155	238.9	8E-02	0.20
G. bavarica vs. *G. brachyphylla*	yes	no	0.366	0.081	4.109	0.000	233.7	3E-08	0.69
G. rostanii vs. *G. schleicheri*	yes	no	1.782	0.000	2.454	0.000	487.2	1E-06	0.07
G. verna vs. *G. rostanii*	yes	no	1.167	0.001	0.084	1.000	575.2	3E-08	0.59

G. utriculosa vs. (*G. pumila, G. nivalis*)	yes	yes	2.009	0.000	0.136	0.185	-410.0	0.000	0.52
G. terglouensis vs. (*G. bavarica, G. brachyphylla, G. rostanii, G. schleicheri, G. verna*)	yes	no	-0.364	0.377	0.925	0.008	-163.8	0.218	0.73
G. rostanii vs. (G. verna, G. schleicheri)	yes	no	-0.842	0.009	-0.196	0.469	458.2	0.000	0.59
mean cpDNA sister species relationships			**1.527**		**1.000**		**393.460**		**0.50**
mean cpDNA closely related species			**1.538**		**0.809**		**380.184**		**0.46**
mean rDNA sister species relationships			**0.711**		**0.922**		**211.190**		**0.56**
mean rDNA closely related species			**1.122**		**1.116**		**363.095**		**0.52**
G.* sect. *Gentiana									
G. lutea vs. *G. burseri*	yes	yes	0.304	0.736	0.753	0.000	679.0	3.18E-08	0.68
G. pannonica vs. *G. burseri*	yes	no	0.534	0.832	1.913	0.000	682.7	3.18E-08	0
G. punctata vs. *G. burseri*	yes	yes	0.069	1.000	2.979	0.000	31.1	1.000	0.05
G. purpurea vs. *G. burseri*	yes	no	1.578	0.000	1.397	0.000	172.7	0.010	0
G. pannonica vs. *G. lutea*	yes	no	0.839	0.009	1.160	0.000	3.7	1	0.23
G. punctata vs. *G. lutea*	yes	yes	0.374	0.000	2.227	0.000	710.1	3E-08	0.50
G. purpurea vs. *G. lutea*	yes	no	1.274	0.000	0.644	0.000	506.2	3E-08	0.64
G. purpurea vs. *G. pannonica*	yes	yes	2.112	0.000	0.516	0.206	510.0	3E-08	0.02
G. purpurea vs. *G. punctata*	yes	no	1.647	0.000	1.583	0.000	203.8	3E-08	0.43
G. froelichii vs. *G. asclepiadea*	yes	yes	1.964	0.000	0.299	1.000	107.4	1E+00	0.56
G. froelichii vs. *all other Gentiana*	yes	no	-0.903	0.009	0.297	0.265	-118.4	0.338	0.56
G. asclepiadea vs (*G. burseri, G. punctata, G. purpurea, G. lutea, G. pannonica*)	yes	no	1.689	0.000	-0.002	0.940	-359.3	0.000	0.49
G. pannonica vs. (*G. burseri, G. punctata, G. purpurea, G. lutea*)	yes	no	0.976	0.000	0.674	0.000	-251.8	0.001	0.26
G. lutea vs. (*G. burseri, G. punctata, G. purpurea*)	yes	no	0.949	0.000	-0.356	0.000	-541.8	0.000	0.53
G. purpurea vs. (*G. burseri, G. punctata*)	yes	no	-1.634	0.000	-0.999	0.000	-197.7	0.000	0.43
mean cpDNA sister species relationships			**0.965**		**1.355**		**407.496**		**0.36**
mean rDNA sister species relationships			**0.191**		**0.432**		**-239.653**		**0.39**
mean rDNA closely related species			**0.575**		**0.836**		**75.810**		**0.42**
G.* sect. *Ciminalis									
G. angustifolia vs. *G. acaulis*	yes	yes	0.625	0.000	2.557	0.000	815.9	3E-08	0.28
G. occidentalis vs. *G. acaulis*	yes	yes	0.727	0.000	2.600	0.000	780.2	3E-08	0.19
G. occidentalis vs. *G. angustifolia*	yes	yes	0.101	1.000	0.043	1.000	35.6	1E+00	0.70
G. clusii vs. *G. alpina*	yes	yes	0.492	0.000	1.616	0.000	519.1	3E-08	0.25
G. alpina vs. *G. dinarica*	no	yes	0.100	1.000	3.414	0.000	606.3	6E-06	0
G. clusii vs. *G. dinarica*	no	yes	0.592	0.992	1.798	0.000	87.2	1E+00	0
G. occidentalis vs. *G. dinarica*	yes	no	1.434	0.015	4.152	0.000	475.3	5E-03	0

G. angustifolia vs. *G. dinarica*	yes	no	1.333	0.047	4.109	0.000	511.0	2E-03	0
G. dinarica vs. *G. acaulis*	yes	no	-0.707	0.933	1.552	0.000	-304.9	4E-01	0
G. clusii vs. all other *Ciminalis*	yes	no	0.017	0.963	-0.584	0.000	-118.4	0.338	0.62
G. alpina vs. (*G. acaulis, G, occidentalis, G. dinarica, G. angustifolia*)	yes	no	0.713	0.000	1.448	0.000	-359.3	0.000	0.69
G. angustifolia vs. (*G. acaulis, G. occidentalis, G. dinarica*)	yes	no	-0.562	0.000	2.321	0.000	-251.8	0.001	0.64
G. acaulis vs. (*G. occidentalis, G. dinarica*)	yes	no	0.586	0.000	-2.192	0.000	-541.8	0.000	0.15
G. alpina vs. (*G. clusii, G. dinarica*)	no	yes	-0.480	0.000	-1.651	0.000	520.8	0.000	0.25
G. angustifolia vs. (*G. occidentalis, G. acaulis*)	no	yes	0.554	0.000	-2.302	0.000	-739.4	0.000	0.64
G. dinarica vs. (*G. acaulis, G. occidentalis*)	yes	no	-0.903	0.009	0.297	0.265	-118.4	0.338	0
G. acaulis vs. (*G. occidentalis, G. angustifolia*)	no	yes	-0.680	0.000	2.580	0.000	796.7	0.000	0.25
mean cpDNA sister species relationships			**0.348**		**0.111**		**162.210**		**0.27**
mean cpDNA closely related species			**0.339**		**1.009**		**328.218**		**0.29**
mean rDNA sister species relationships			**-0.002**		**1.216**		**-13.518**		**0.43**
mean rDNA closely related species			**0.297**		**1.828**		**180.399**		**0.31**

Appendix Vf: Complement to Figure 4. Comparisons of rates of niche evolution. Maximum a posteriori density values for estimated evolutionary rates (σ2) for eleven selected WorldClim variables and the first two principal components of each of the three studied European sections of *Gentiana*. Based on the rDNA and plastid topologies, including *G. ligustica* or not, rates were modelled separately for each section under a Brownian motion model in R.

		PLASTID TREES						**rDNA TREES**					
		***C. ligustica* added**		**Tree as is**		**500 trees**		***C. ligustica* added**		**Tree as is**		**500 trees**	
Variables	**Sections**	**value**	**rescaled**	**value**	**rescaled**	**value**	**rescaled**	**value**	**rescaled**	**value**	**rescaled**	**value**	**rescaled**
Bio 1	***Ciminalis***	2.4939	1.0000	2.8461	1.0000	2.5940	1.0000	1.8219	1.0000	2.0546	1.0000	2.2100	1.0000
	Gentiana	0.1928	0.0000	0.1928	0.0000	0.1680	0.0000	0.1891	0.0000	0.1891	0.0000	0.1920	0.0000
	Calathianae	1.1898	0.4333	1.1898	0.3758	1.1550	0.4068	0.8979	0.4341	0.8979	0.3799	0.7180	0.2607
Bio 2	***Ciminalis***	0.4560	1.0000	0.2676	1.0000	0.2300	1.0000	0.4433	1.0000	0.4747	1.0000	0.4040	1.0000
	Gentiana	0.1594	0.0360	0.1594	0.0929	0.1610	0.2333	0.1870	0.2091	0.1870	0.1907	0.1850	0.2935
	Calathianae	0.1483	0.0000	0.1483	0.0000	0.1400	0.0000	0.1192	0.0000	0.1192	0.0000	0.0940	0.0000
Bio 3	***Ciminalis***	5.1917	1.0000	3.7408	1.0000	4.0530	1.0000	6.0551	1.0000	6.8484	1.0000	6.3470	1.0000
	Gentiana	0.3800	0.0000	0.3800	0.0000	0.3880	0.0000	0.4432	0.0000	0.4432	0.0000	0.4390	0.0000
	Calathianae	0.8022	0.0877	0.8022	0.1256	0.7480	0.0982	0.6804	0.0423	0.6804	0.0370	0.5280	0.0151
Bio 4	***Ciminalis***	270.5626	1.0000	296.4035	1.0000	324.1240	1.0000	366.4502	1.0000	425.2503	1.0000	522.2760	1.0000
	Gentiana	131.5559	0.1313	131.5559	0.1131	142.2890	0.0890	123.6492	0.1709	123.6492	0.1423	135.7220	0.1306
	Calathianae	110.5387	0.0000	110.5387	0.0000	124.5190	0.0000	73.6055	0.0000	73.6055	0.0000	77.6590	0.0000
Bio 8	***Ciminalis***	0.8424	0.0000	0.9600	0.0000	0.9090	0.0000	1.0147	0.0000	1.1617	0.0000	1.2630	0.0000
	Gentiana	5.5602	1.0000	5.5602	1.0000	5.7280	1.0000	2.4110	0.4387	2.4110	0.4115	2.3580	0.4917
	Calathianae	4.9439	0.8694	4.9439	0.8660	4.8630	0.8205	4.1976	1.0000	4.1976	1.0000	3.4900	1.0000
Bio 9	***Ciminalis***	18.1092	1.0000	19.2236	1.0000	18.9120	1.0000	14.4631	1.0000	15.9143	1.0000	17.8250	1.0000
	Gentiana	8.8143	0.3551	8.8143	0.3296	8.9010	0.3348	5.9566	0.3217	5.9566	0.2883	6.3490	0.2716
	Calathianae	3.6968	0.0000	3.6968	0.0000	3.8620	0.0000	1.9221	0.0000	1.9221	0.0000	2.0710	0.0000
Bio 12	***Ciminalis***	5991.2704	0.4679	6110.3555	0.4869	7120.2080	0.5026	5332.4266	0.5244	5622.7601	0.5784	7389.0080	0.7284
	Gentiana	3058.8923	0.0000	3058.8923	0.0000	2961.5800	0.0000	2513.8904	0.0000	2513.8904	0.0000	2877.3870	0.0000
	Calathianae	9326.1587	1.0000	9326.1587	1.0000	11235.4290	1.0000	7888.6580	1.0000	7888.6580	1.0000	9071.5930	1.0000
Bio 15	***Ciminalis***	1.7851	0.0000	0.2433	0.0000	0.3030	0.0000	0.9883	0.0000	0.4153	0.0000	0.3260	0.0000
	Gentiana	6.3177	0.5927	6.3177	0.6610	6.3690	0.6033	2.8896	0.3867	2.8896	0.4508	2.9590	0.5103

	Calathianae	9.4328	1.0000	9.4328	1.0000	10.3570	1.0000	5.9045	1.0000	5.9045	1.0000	5.4860	1.0000
Bio 18	***Ciminalis***	2363.0755	1.0000	2316.9456	0.9944	2244.4120	0.0000	1399.4515	0.1891	1473.6846	0.7778	1835.1030	1.0000
	Gentiana	2319.3337	0.9066	2319.3337	1.0000	2716.7710	1.0000	1375.6084	0.0000	1375.6084	0.0000	1574.7020	0.0000
	Calathianae	1894.7560	0.0000	1894.7560	0.0000	2544.0960	0.6344	1501.7102	1.0000	1501.7102	1.0000	1755.0640	0.6926
Bio 19	***Ciminalis***	473.7338	1.0000	520.4708	1.0000	531.7590	1.0000	645.0061	1.0000	731.4039	1.0000	941.2920	1.0000
	Gentiana	394.7454	0.3514	394.7454	0.2540	433.3870	0.2279	162.3840	0.0000	162.3840	0.0000	169.9360	0.0000
	Calathianae	351.9425	0.0000	351.9425	0.0000	404.3560	0.0000	258.8405	0.1999	258.8405	0.1695	281.7480	0.1450
Altitude	***Ciminalis***	49200.3223	1.0000	56398.2901	1.0000	69027.0730	1.0000	38067.5765	1.0000	44370.2258	1.0000	60313.2770	1.0000
	Gentiana	22853.5450	0.0000	22853.5450	0.0000	25632.0780	0.0000	10875.7903	0.0000	10875.7903	0.0000	12451.6440	0.0000
	Calathianae	43195.5885	0.7721	43195.5885	0.6064	54351.3640	0.6618	36215.2792	0.9319	36215.2792	0.7565	43658.8310	0.6520
PC1	***Ciminalis***	0.0962	0.0000	0.0501	0.0000	0.0430	0.0000	0.0880	0.0000	0.0973	0.0000	0.0860	0.0000
	Gentiana	0.2691	0.7623	0.2691	0.8024	0.2710	0.8507	0.1735	0.4832	0.1735	0.4545	0.1820	0.7164
	Calathianae	0.3230	1.0000	0.3230	1.0000	0.3110	1.0000	0.2649	1.0000	0.2649	1.0000	0.2200	1.0000
PC2	***Ciminalis***	0.6508	1.0000	0.6795	1.0000	0.6290	1.0000	0.7263	1.0000	0.8409	1.0000	0.8120	1.0000
	Gentiana	0.1315	0.0000	0.1315	0.0000	0.1310	0.0000	0.1108	0.0000	0.1108	0.0000	0.1160	0.0000
	Calathianae	0.2470	0.2224	0.2470	0.2108	0.2430	0.2249	0.1828	0.1170	0.1828	0.0987	0.1440	0.0402