

Supplementary Material

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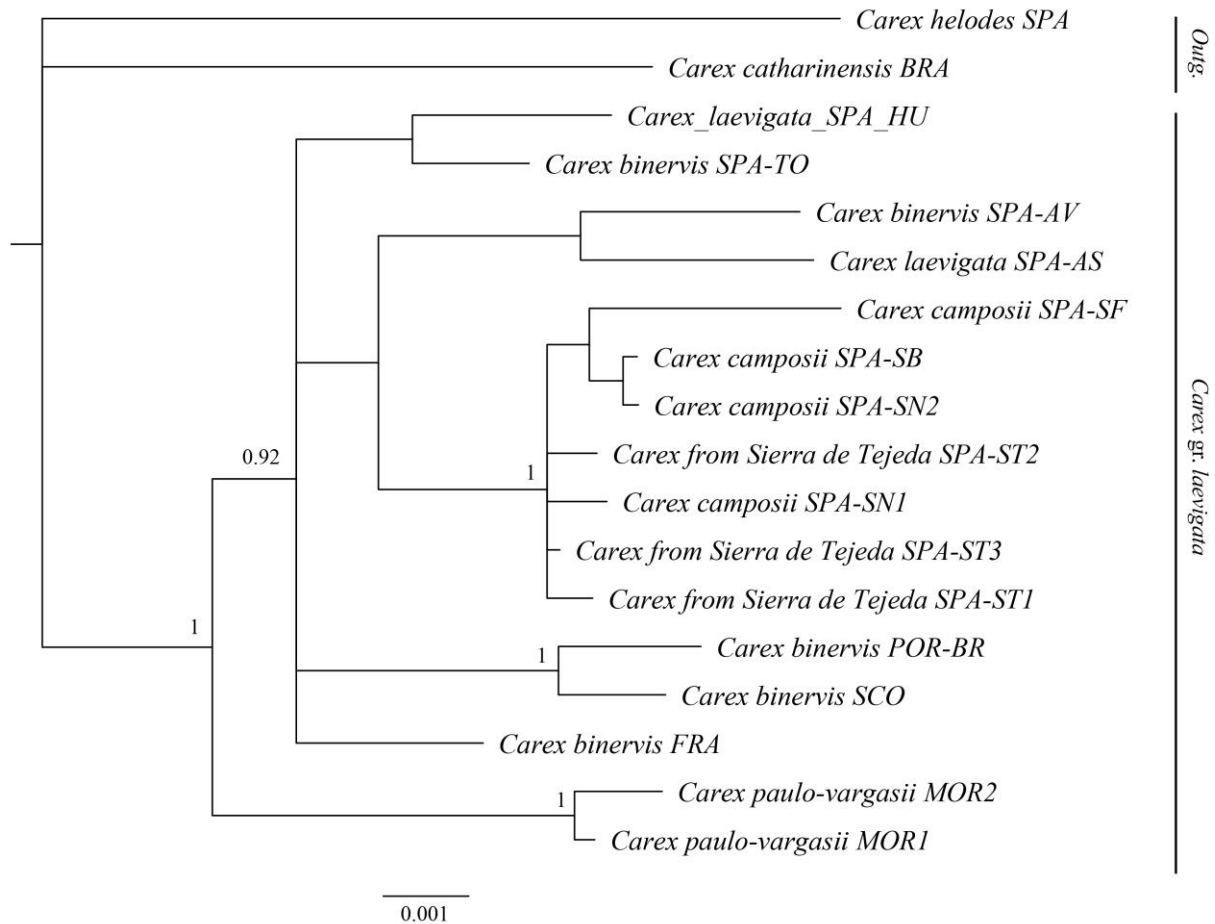


Figure S1. Majority-rule consensus tree obtained from the Bayesian analysis of all the combined DNA regions (*ITS*, *ETS*, *G3PDH*, *CATP*, *GZF*, *matK*, *rpS16* and 5' *trnK* intron). Node labels indicate posterior probability of the clades only when it is higher than 0.9. Tip labels indicate species names and populations (see Supplementary material, Table S1). Scale bar represents substitutions per site.

Table S1. Studied material including taxon, population code, locality, voucher and/or herbarium number, and NCBI GenBank accession numbers for each molecular marker (*ITS*, *ETS*, *G3PDH*, *CATP*, *GZF*, *matK*, *5'trnK* intron, *rps16*).

Taxon	Population code	Locality	Voucher (herbarium code)	NCBI GenBank accession numbers (<i>ITS</i>, <i>ETS</i>, <i>G3PDH</i>, <i>CATP</i>, <i>GZF</i>, <i>matK</i>, <i>rps16</i>, <i>5'trnK</i> intron)
<i>Carex</i> subsect. <i>Elatae</i> (Kük) Luceño & M. Escudero				
<i>C. catharinensis</i> Boeck.	BRA	Brazil, Itatiaia	M.V. Alves <i>et al.</i> 2758MAV (UPOS-1790)	OP539444, OP589813, OP589858, OP589836, OP589845, OP629966, OP629968, OP629985
<i>C. helodes</i> Link	MOR	Morocco, Chefchaouene	P. Jiménez-Mejías 28PJM04 <i>et al.</i> (UPOS-4615)	OP539443, OP589815, OP589857, OP589830, OP589850, OP629965, OP629969, OP629987
<i>C. gr. laevigata</i>				
<i>C. binervis</i> Sm.	SCO	Scotland, Highlands, Inverness, Loch Ness	S. Martín-Bravo 108SMB07 <i>et al.</i> (UPOS-6306)	OP539450, OP589828, OP589867, OP589837, _____, OP629951, OP629978, OP629990
<i>C. binervis</i>	FRA	France, Britain, Morlaix, Brasparts	M. Escudero <i>et al.</i> (9ME06(1))	MN762291, MN760119, _____, _____, _____, MN563596, _____, _____
<i>C. binervis</i>	POR-BR	Portugal, Braga, Vila Nova de Famalicão, Fradelos	P.J. Mendes Alves S.N. (UPOS-8801)	OP539449, OP589825, OP589866, OP589833, OP589848, OP629952, OP629976, OP629989
<i>C. binervis</i>	SPA-TO	Spain, Toledo, Cabañeros National Park, Chorro de los Navalucillos path	P. Jiménez-Mejías 66PJM13 <i>et al.</i> (UPOS-5485)	OP539448, OP589819, OP589865, OP589835, OP589849, OP629962, OP629981, OP629983
<i>C. binervis</i>	SPA-AV	Spain, Candeleda, Muelas river	R. Sánchez-Villegas 97RSV21 <i>et al.</i> (UPOS-14128)	OP539446, OP589816, OP589869, OP589834, OP589846, OP629955, OP629979, OP629991
<i>C. camposii</i> Boiss. & Reut. subsp. <i>camposii</i>	SPA-SN1	Spain, Sierra Nevada, Soportújar, Balsa del Almiar	R. Sánchez-Villegas 73RSV21 <i>et al.</i> (UPOS-14127)	OP539454, OP589820, OP589864, OP589842, OP589854, OP629956, OP629977, OP629992
<i>C. camposii</i> subsp. <i>camposii</i>	SPA-SN2	Spain, Granada, Sierra Nevada, Pradollano, Monachil river	P. Jiménez-Mejías 156PJM06 & M. Escudero (UPOS-3831)	OP539457, OP589826, OP589860, OP589838, OP589855, OP629960, OP629971, OP629996
<i>C. camposii</i> subsp. <i>camposii</i>	SPA-SF	Spain, Almería, Sierra de los Filabres	P. Jiménez-Mejías 167PJM06 & M. Escudero (UPOS-3836)	OP539452, OP589818, OP589861, OP589843, _____, OP629953, OP629970, OP629986
<i>C. camposii</i> subsp. <i>camposii</i>	SPA-SB	Spain, Granada, Sierra de Baza, Cañada de los Gitanos	J.M. Sierra 17JMS08 (UPOS-14129)	OP539456, OP589827, _____, OP589832, OP589856, OP629961, OP629974, OP629993

Taxon	Population Code	Locality	Voucher (herbarium code)	NCBI GenBank accession numbers (ITS, ETS, G3PDH, CATP, GZF, matK, rps16, 5'trnK intron)
<i>C. camposii</i> subsp. <i>tejedensis</i> Luceño, Sánchez-Villegas & Escudero	SPA-ST1	Spain, Málaga, Sierra Tejada, Canillas de Albaida, El Nevazo stream	R. Sánchez-Villegas 65RSV21(1) <i>et al.</i> (UPOS-14126)	OP539455, OP589823, OP589859, OP589841, OP589853, OP629958, OP629972, OP629997
<i>C. camposii</i> subsp. <i>tejedensis</i>	SPA-ST2	Spain, Málaga, Sierra Tejada, Canillas de Albaida, El Nevazo stream	R. Sánchez-Villegas 65RSV21(2) <i>et al.</i> (UPOS-14126)	OP539458, OP589821, OP589862, OP589839, OP589851, OP629959, OP629975, OP629994
<i>C. camposii</i> subsp. <i>tejedensis</i>	SPA-ST3	Spain, Málaga, Sierra Tejada, Canillas de Albaida, El Nevazo stream	R. Sánchez-Villegas 65RSV21(3) <i>et al.</i> (UPOS-14126)	OP539453, OP589822, OP589863, OP589840, OP589852, OP629957, OP629973, OP629995
<i>C. laevigata</i> Sm.	SPA-HU	Spain, Huelva, Moguer, Dehesa del Estero	E. Sánchez-Guillón & P. Weickert s.n. (UPOS-2762)	OP539445, OP589824, OP589871, _____, OP589847, OP629964, OP629980, OP629984
<i>C. laevigata</i>	SPA-AS	Spain, Asturias	P. Jiménez-Mejías 446PJM05 <i>et al.</i> (UPOS-3796)	OP539447, OP589817, OP589870, OP589829, _____, OP629963, OP629967, _____
<i>C. paulo-vargasii</i> Luceño & J.M. Marín.	MOR1	Morocco, Akarate, Jebala Mountains, between Dardara and Ksarel Kebir	J. Fernández 35JFA03 (UPOS-4614)	OP539451, OP589814, OP589868, OP589831, _____, OP629954, OP629982, OP629988
<i>C. paulo-vargasii</i>	MOR2	Morocco, Rif Mountains	J. Fernández <i>et al.</i> 35JFA03(12)	MN762347, MN759843, _____, _____, _____, MN762408, _____, _____

Table S2. Characteristics of the nuclear, plastid and combined matrixes.

Matrix	Sample number	Matrix length (bp)	Matrix length range (bp)	Variable sites	Parsimony-informative sites	Best nucleotide substitutional method	AICc
<i>ITS1</i>	18	264	257–263	-	-	HKY+G	1196.48
<i>5.8 S</i>	18	166	203–225	-	-	K80	586.35
<i>ITS2</i>	18	225	166	-	-	HKY+I	953.76
<i>ETS</i>	18	535	525–534	-	-	HKY+I	2117.91
<i>CATP</i>	16	344	327–344	-	-	HKY	1156.47
<i>G3PDH</i>	15	201	111–199	-	-	HKY+G	726.50
<i>GZF</i>	12	578	536–575	-	-	F81	1730.71
<i>matK</i>	18	587	580–586	-	-	HKY	1942.67
<i>rps16</i>	16	842	758–740	-	-	GTR	2460.14
<i>5'trnK</i> intron	15	728	695–710	-	-	HKY	2110.13
nuclear	18	2313	1174–2295	125	50	-	-
plastid	18	2157	586–2126	58	23	-	-
combined	18	4470	1760–4417	183	75	-	-

Table S3. Materials used for the elaboration of the distribution map of the two subspecies of *Carex camposii*. The search for the locations of *C. camposii* subsp. *camposii* has been carried out through the GBIF (GBIF, 2021) and Anthos (Anthos, 2011) platforms. The geographic datum used is ETRS89.

Taxon	Locality	Latitude	Longitude	Altitude (m)	Voucher number (Herbarium code) or reference	Basis of record
<i>Carex camposii</i> subsp. <i>camposii</i>	Almería, Abrucena, Peña Horadada ravine	37.04	-2.88	1950	Lorite <i>et al.</i> , 2003	Human observation
	Almería, Bacades	37.232668	-2.516502	1833	REDIAM, 2009	Human observation
	Almería, Bayárcal	37.071405	-3.012509	2013	REDIAM, 2009	Human observation
	Almería, Bayárcal	37.071405	-3.001259	1821	REDIAM, 2009	Human observation
	Almería, Bayárcal	37.071404	-2.990009	1801	REDIAM, 2009	Human observation
	Almería, Bayárcal	37.06239	-3.012507	1720	REDIAM, 2009	Human observation
	Almería, Bayárcal	37.026331	-2.978773	1540	REDIAM, 2009	Human observation
	Almería, Bayárcal	37.062391	-3.001259	1666	REDIAM, 2009	Human observation
	Almería, Bayárcal, Anchuelo Stream	37.046222	-3.0	1700	Salazar <i>et al.</i> , 2001	Human observation
	Almería, Bayárcal, Anchuelo stream	37.046231	-3.0	1600	Lorite <i>et al.</i> , 2003	Human observation
	Almería, Laujar de Andarax	37.026307	-2.922558	1367	REDIAM, 2009	Human observation
	Almería, Laujar de Andarax	37.053311	-2.877542	1543	REDIAM, 2009	Human observation
	Almería, Laujar de Andarax, Andarax river	37.046222	-2.999933	1200	Salazar <i>et al.</i> , 2001	Human observation
	Almería, Los Filabres	37.178769	-2.491130	-	Peñas <i>et al.</i> , 2005	Human observation
	Almería, Negro ravine	37.268771	-2.491132	-	Luceño, 1992	Human observation
	Almería, Paterna del Río	37.053363	-2.945024	1601	REDIAM, 2009	Human observation
	Almería, Paterna del Río	37.080411	-2.956255	1771	REDIAM, 2009	Human observation
	Almería, Paterna del Río	37.08942	-2.944997	2041	REDIAM, 2009	Human observation
	Almería, Paterna del Río	37.080406	-2.945004	1863	REDIAM, 2009	Human observation
	Almería, Paterna del Río	37.062382	-2.956266	1515	REDIAM, 2009	Human observation
	Almería, Paterna del Río	37.062377	-2.945018	1730	REDIAM, 2009	Human observation
	Almería, Sierra de los Filabres	37.18	-2.72	-	HUAL 7142	Preserved specimen
	Almería, Sierra de los Filabres, del Cano ravine	37.239	-2.577	-	HUAL 7110	Preserved specimen

Taxon	Locality	Latitude	Longitude	Altitude (m)	Voucher number (Herbarium code) or reference	Basis of record
	Almería, Sierra de los Filabres, Tetica, Purchena	37.268771	-2.381130	-	Luceño, 1992	Human observation
	Capileira, Poqueira tributary	37.140387	-3.110734	1400	Salazar <i>et al.</i> , 2001	Human observation
	Granada, Aldeire	37.116423	-3.113821	2093	REDIAM, 2009	Human observation
	Granada, Aldeire	37.134485	-3.068812	1501	REDIAM, 2009	Human observation
	Granada, Aldeire	37.116411	-3.125078	2076	REDIAM, 2009	Human observation
	Granada, Aldeire, Pasillos stream	37.04	-3.11	1640	Salazar, 1996	Human observation
	Granada, Alhama de Lugros river, camarate meadow	37.041045	-3.123617	1300	Salazar <i>et al.</i> , 2001	Human observation
	Granada, Alpujarra de la Sierra	37.0533	-3.136222	2043	REDIAM, 2009	Human observation
	Granada, Alpujarra de la Sierra	37.044258	-3.158697	2165	REDIAM, 2009	Human observation
	Granada, Alpujarra de la Sierra	36.999186	-3.158604	1497	REDIAM, 2009	Human observation
	Granada, Barrio river	37.04	-3.22	1900	Salazar, 1996	Human observation
	Granada, Bérchules	37.035175	-3.203655	2001	REDIAM, 2009	Human observation
	Granada, Bérchules	37.026161	-3.203631	1883	REDIAM, 2009	Human observation
	Granada, Bérchules	37.017127	-3.214848	1964	REDIAM, 2009	Human observation
	Granada, Bérchules	37.044226	-3.181188	1901	REDIAM, 2009	Human observation
	Granada, Bérchules	36.990104	-3.203535	1655	REDIAM, 2009	Human observation
	Granada, Bérchules	37.035228	-3.169922	2075	REDIAM, 2009	Human observation
	Granada, Bérchules	36.990122	-3.192297	1342	REDIAM, 2009	Human observation
	Granada, Bérchules	37.053222	-3.192456	2169	REDIAM, 2009	Human observation
	Granada, Camarate meadow	37.22	-3.33	1500	Lorite <i>et al.</i> , 2003	Human observation
	Granada, Caniles, Ribero ravine, proximal to Benacebada	37.276	-2.69	-	HUAL 7144	Preserved specimen
	Granada, Capileira	37.007824	-3.338462	1927	REDIAM, 2009	Human observation
	Granada, Capileira	36.99881	-3.338422	2020	REDIAM, 2009	Human observation
	Granada, Capileira	36.989763	-3.349619	1690	REDIAM, 2009	Human observation
	Granada, Capileira	36.980715	-3.360813	1511	REDIAM, 2009	Human observation

Taxon	Locality	Latitude	Longitude	Altitude (m)	Voucher number (Herbarium code) or reference	Basis of record
	Granada, Capileira, above capileira	36.96	-3.34	2000	C. Aedo <i>et al.</i> (ABH 50629)	Preserved specimen
	Granada, Chorreras ravine, Camarate meadow	37.13	-3.33	2200	Salazar, 1996	Human observation
	Granada, Corral del Veleta, east flank	37.04	-3.44	2950	Quèzel, 1953	Human observation
	Granada, Dílar river	37.04	-3.44	2120	Salazar, 1996	Human observation
	Granada, Dúrcal	37.03436	-3.48475	1834	REDIAM, 2009	Human observation
	Granada, Dúrcal	37.025435	-3.462208	2275	REDIAM, 2009	Human observation
	Granada, Dúrcal	37.0253	-3.495935	1901	REDIAM, 2009	Human observation
	Granada, Güejar Sierra	37.152081	-3.327842	1915	REDIAM, 2009	Human observation
	Granada, Güejar Sierra	37.197087	-3.350572	1400	REDIAM, 2009	Human observation
	Granada, Güejar Sierra	37.17899	-3.37302	1886	REDIAM, 2009	Human observation
	Granada, Güejar Sierra	37.088983	-3.327571	1801	REDIAM, 2009	Human observation
	Granada, Güejar Sierra	37.088951	-3.338823	1868	REDIAM, 2009	Human observation
	Granada, Güejar Sierra	37.188226	-3.294197	2069	REDIAM, 2009	Human observation
	Granada, Güejar Sierra, Cañada Real del Camino de los Neveros	37.163906	-3.414514	2250	R. Sánchez-Villegas <i>et al.</i> 134RSV21	Preserved specimen
	Granada, Jerez del Marquesado	37.152072	-3.190942	1500	J.M. Sierra 22JMS08	Preserved specimen
	Granada, Jerez del Marquesado	37.143345	-3.203943	1601	REDIAM, 2009	Human observation
	Granada, Lanjarón, sendero de Lanjarón, Casas de Tello	36.958736	-3.460822	1550	S. Martín-Bravo 73SMB11 (UPOS6816)	Preserved specimen
	Granada, Lugros	37.188329	-3.24913	1401	REDIAM, 2009	Human observation
	Granada, Lugros	37.206357	-3.249189	1301	REDIAM, 2009	Human observation
	Granada, Monachil	37.097633	-3.440141	1762	REDIAM, 2009	Human observation
	Granada, Monachil, Sierra Nevada, San Gerónimo meadow	37.09	-3.39	2000	(ABH 32609)	Preserved specimen
	Granada, Nevada	37.089425	-3.046268	2157	REDIAM, 2009	Human observation
	Granada, Nevada	37.026329	-3.034988	1459	REDIAM, 2009	Human observation

Taxon	Locality	Latitude	Longitude	Altitude (m)	Voucher number (Herbarium code) or reference	Basis of record
	Granada, Nigüelas	37.007318	-3.484578	2061	REDIAM, 2009	Human observation
	Granada, Nigüelas	37.016377	-3.473395	2312	REDIAM, 2009	Human observation
	Granada, Pampaneira	36.962617	-3.383194	1817	REDIAM, 2009	Human observation
	Granada, Pradollano, Río Monachil	37.09055	-3.400127	-	P. Jiménez-Mejías 156PJM06 & M. Escudero (UPOS3831)	Preserved specimen
	Granada, Sierra de Baza, Arroyo Moras	37.22	-2.77	1560	Salazar, 1996	Human observation
	Granada, Sierra de Baza, La Cañada de los Gitanos	37.235656	-2.711786	2000	J.M. Sierra 17JMS08 (UPOS14129)	Preserved specimen
	Granada, Sierra Nevada	37.1067	-3.4176	-	(MA 17994)	Preserved specimen
	Granada, Sierra Nevada, Corral del Veleta	37.05722	-3.36444	-	(G 166090/1)	Preserved specimen
	Granada, Sierra Nevada, Dílar ravine	37.0617	-3.4174	-	(MA 484978)	Preserved specimen
	Granada, Sierra Nevada, Horcajo de Trevélez	37.1	-3.22	-	(BCN 54642)	Preserved specimen
	Granada, Sierra Nevada, proximal to Capileira	36.98	-3.33	2150	(ABH 50607)	Preserved specimen
	Granada, Sierra Nevada, Ragua mountain pass	37.1165	-3.035	-	(MA 314735)	Preserved specimen
	Granada, Sierra Nevada, Ragua mountain pass	37.1075	-3.035	-	(MA 198897)	Preserved specimen
	Granada, Sierra Nevada, road from Pico Mulhacén to Capileira	36.98	-3.33	-	(SALA 78826)	Preserved specimen
	Granada, Soportújar, Acequia del Almiar, Cortijo de Haza Llana	36.959339	-3.403781	1750	R. Sánchez-Villegas <i>et al.</i> 71RSV21	Preserved specimen
	Granada, Trevélez	37.007997	-3.271023	1823	REDIAM, 2009	Human observation
	Granada, Trevélez	37.017084	-3.237331	1960	REDIAM, 2009	Human observation
	Granada, Trevélez	36.989969	-3.270959	1509	REDIAM, 2009	Human observation

Taxon	Locality	Latitude	Longitude	Altitude (m)	Voucher number (Herbarium code) or reference	Basis of record
	Granada, Trevélez	37.017037	-3.259813	1601	REDIAM, 2009	Human observation
	Granada, Trevélez	37.053141	-3.237443	1893	REDIAM, 2009	Human observation
	Granada, Trevélez	37.044079	-3.259905	2073	REDIAM, 2009	Human observation
	Granada, Trevélez	37.007971	-3.282263	1904	REDIAM, 2009	Human observation
	Granada, Trevélez	37.026051	-3.259844	1801	REDIAM, 2009	Human observation
	Granada, Válor	37.053333	-3.102481	1887	REDIAM, 2009	Human observation
	Granada, Válor	37.080376	-3.102517	2299	REDIAM, 2009	Human observation
	Granada, Válor	37.062348	-3.102493	1979	REDIAM, 2009	Human observation
<i>Carex camposii</i> subsp. <i>tejedensis</i>	Málaga, Sierra Tejeda, Canillas de Albaida, El Nevazo stream	36.882208	-3.950781	1381	R. Sánchez-Villegas <i>et al.</i> , 65RSV21 (UPOS 14126)	Preserved specimen

Table S4. Morphological characters examined of *Carex camposii* (including subsp. *tejedensis*).

Plant element	Morphological characters
Rhizome internodes	Width of the internodes; Length of the internodes; Color
Flowering culms	Length (cm); Width (cm)
Leaves	Width (cm); Exceeds or not the inflorescence length; Consistency (soft or rigid); Color; Cross section; Roughness
Ligule	Length (mm); Shape (acute or obtuse)
Basal sheaths	Bladeless or with lamina; Fibrous or not
Lowest bract of the inflorescence	Leaf-like or not; Exceeds or not the inflorescence length
Male spikes	Number; Length of the upper one (mm); Width of the upper one (mm); Length of the lower ones (mm); Width of the lower ones (mm); Shape
Female spikes	Length (mm); Width (mm); Shape; Pedunculate or sessile; Gender distribution
Male glumes	Length (mm); Width (mm); Shape; Color; Mucronate or not
Female glumes	Length (mm); Width (mm); Shape; Color; Mucronate or not
Utricles	Length (mm); Width (mm); Shape; Pilosity; Color; Nerving; Attenuated or contracted into the beak; Beak length (mm)
Achenes	Length (mm); Width (mm); Shape

