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Supplementary Material

Genetic diversity within and across gametophytic ploidy levels in a *Sphagnum* cryptic species complex

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Table S1. Voucher data.

Table S2. Raw numbers of alleles recovered (N_A), the number of different alleles detected per individual (N_{WI}), and the percent of individuals having the corresponding *NI* (% of samples) per SSR marker study for the three lineages of the *Sphagnum ×australe s.l.* complex. The mean N_I averaged across all five SSRs for each sample and then averaged across all samples in each lineage is also shown.

Table S3. SSR alleles sorted into parental genomes associated with the *Sphagnum ×australe s.l.* complex (R/S and F). Just one copy of each haplotype is shown. Unpublished SSR data for *S. strictum s.l.* makes it possible to assign each allele to its associated monoploid genome at SSR-1 and SSR-18 (Karlin unpublished data).

Figure S1. Tree based on Bayesian MCMC analysis showing the allelic divergence among the respective RS genomes of the members *S. ×australe s.l.* complex, with monoploid F genome of $FR_{1*}S_{1*}$ being included as an outgroup. The two $R_{1*}S_{1*}$ haplotypes shared with some R_1S_1 samples are indicated by degree symbols. Based on the genetic diversity between pairwise comparisons (Δ_{AI}) of samples.

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Table S1. Voucher data

allodiploid

DNA #	Genus	Species	lineage	Country	State/Island	Collector	Collection	Date	Herbarium
EK465	*Sphagnum*	*australe*	Lineage I	Australia	Tasmania	Buck	52760	5-Dec-07	NY
EK466	*Sphagnum*	*australe*	Lineage I	Australia	Tasmania	Buck	52780	6-Dec-07	NY
EK467	*Sphagnum*	*australe*	Lineage I	Australia	Tasmania	Buck	52730	7-Dec-07	NY
EK629	*Sphagnum*	*australe*	Lineage I	Australia	Tasmania	Buck	52794	8-Dec-07	NY
EK1033	*Sphagnum*	*australe*	Lineage I	Australia	Tasmania	Dalton	7.77	14 II 2007	Univ. Tasmania
EK959	*Sphagnum*	*australe*	Lineage I	Australia	Tasmania	Buck	57946	12-Jul-11	NY
EK960	*Sphagnum*	*australe*	Lineage I	Australia	Tasmania	Buck	58000	13-Jul-11	NY
EK961	*Sphagnum*	*australe*	Lineage I	Australia	Tasmania	Buck	57963	13-Jul-11	NY
EK962	*Sphagnum*	*australe*	Lineage I	Australia	Tasmania	Buck	57997	13-Jul-11	NY
EK963	*Sphagnum*	*australe*	Lineage I	Australia	Tasmania	Buck	58056	14-Jul-11	NY
EK1030	*Sphagnum*	*australe*	Lineage I	Australia	Tasmania	Dalton	15.13	26 IV 2015	Univ. Tasmania
EK1031	*Sphagnum*	*australe*	Lineage I	Australia	Tasmania	Dalton	15.13	26 IV 2015	Univ. Tasmania
EK971	*Sphagnum*	*australe*	Lineage I	Australia	Tasmania	Whinam	s.n.	2012	HO
EK972	*Sphagnum*	*australe*	Lineage I	Australia	Tasmania	Seppelt	29467	2013	HO
EK973	*Sphagnum*	*australe*	Lineage I	Australia	Tasmania	Seppelt	29464	2013	HO
EK974	*Sphagnum*	*australe*	Lineage I	Australia	Tasmania	Seppelt	29466	2013	HO
EK975	*Sphagnum*	*australe*	Lineage I	Australia	Tasmania	Seppelt	29431	2013	HO
EK976	*Sphagnum*	*australe*	Lineage I	Australia	Tasmania	Cave	1935	2014	HO
EK978	*Sphagnum*	*australe*	Lineage I	Australia	Tasmania	Whinam	s.n.	2014	HO
EK979	*Sphagnum*	*australe*	Lineage I	Australia	Tasmania	Whinam	s.n.	2014	HO
EK988	*Sphagnum*	*australe*	Lineage I	Australia	Tasmania	Cave	1164	3/15/2010	MEL
EK990	*Sphagnum*	*australe*	Lineage I	Australia	Tasmania	Klazenga, N.	5573	4/8/2000	MEL
EK977	*Sphagnum*	*australe*	Lineage I	Australia	Tasmania (Flinders Isl.)	Cave	2179	2014	HO
EK989	*Sphagnum*	*australe*	Lineage I	Australia	Victoria	Stajsic, V.	4834	11/8/2008	MEL
EK991	*Sphagnum*	*australe*	Lineage I	Australia	Victoria	Bryophyte Workir	s.n.	7/5/1998	MEL
EK915	*Sphagnum*	*australe*	Lineage I	New Zealand	Campbell Island	Meurk	SA-113	1971	NY
EK916	*Sphagnum*	*australe*	Lineage I	New Zealand	Campbell Island	Meurk	SA-113	1971	NY
EK191	*Sphagnum*	*australe*	Lineage I	New Zealand	South Island	Karlin	EK1211p	12-Nov-05	DUKE
EK258	*Sphagnum*	*australe*	Lineage I	New Zealand	South Island	Karlin	EK1749	17-Nov-05	DUKE
EK259	*Sphagnum*	*australe*	Lineage I	New Zealand	South Island	Karlin	EK1750	18-Nov-05	DUKE
EK265	*Sphagnum*	*australe*	Lineage I	New Zealand	South Island	Karlin	EK1765	19-Nov-05	DUKE
EK967	*Sphagnum*	*australe*	Lineage I	New Zealand	South Island	Cave	676	2007	HO
EK968	*Sphagnum*	*australe*	Lineage I	New Zealand	South Island	Cave	1357	2010	HO
EK956	*Sphagnum*	*australe*	Lineage I	Australia	Tasmania	Moscal, A	4198	10-Nov-83	NY
EK957	*Sphagnum*	*australe*	Lineage I	Australia	Tasmania	Curnow	4339	1992	NY
EK193	*Sphagnum*	*australe*	Lineage II	New Zealand	South Island	Karlin	EK1013	10-Nov-05	DUKE
EK262	*Sphagnum*	*australe*	Lineage II	New Zealand	South Island	Karlin	EK1019	10-Nov-05	DUKE
EK247	*Sphagnum*	*australe*	Lineage II	New Zealand	South Island	Karlin	EK1208p	12-Nov-05	DUKE
EK982	*Sphagnum*	*australe*	Ambiguous	New Zealand	Chatham Island	Craw	sn	1991	CHR

allotriploid

DNA #	Genus	Species	lineage	Country	State/Island	Collector	Collection	Date	Herbarium
EK965	*Sphagnum*	*antarcticum*	Lineage III	New Zealand	Campbell Island	Seppelt	21414	2000	HO
EK469	*Sphagnum*	*antarcticum*	Lineage III	New Zealand	North Island	Braggins	95166		AK
EK981	*Sphagnum*	*antarcticum*	Lineage III	New Zealand	North Island	MacMillan	BH92/48	1992	CHR
EK470	*Sphagnum*	*antarcticum*	Lineage III	New Zealand	South Island	Andrus	1	2006	BING
EK954	*Sphagnum*	*antarcticum*	Lineage III	New Zealand	South Island	Fife, A.	9789	1992	NY
EK471	*Sphagnum*	*antarcticum*	Lineage III	New Zealand	South Island	Andrus	15	2006	BING
EK468	*Sphagnum*	*antarcticum*	Lineage III	New Zealand	South Island	Fife	*s.n.*	NY	NY
EK955	*Sphagnum*	*antarcticum*	Lineage III	New Zealand	South Island	Streimann, H.	51222	1993	NY
EK1008	*Sphagnum*	*antarcticum*	Lineage III	New Zealand	South Island	Johnson	216	29-Mar-93	CHR
EK474	*Sphagnum*	*antarcticum*	Lineage III	New Zealand	South Island	Andrus	113	2006	BING
EK473	*Sphagnum*	*antarcticum*	Lineage III	New Zealand	South Island	Andrus	54	2006	BING
EK1004	*Sphagnum*	*antarcticum*	Lineage III	New Zealand	South Island	Fife	13181		CHR
EK472	*Sphagnum*	*antarcticum*	Lineage III	New Zealand	South Island	Andrus	39	2006	BING
EK1007	*Sphagnum*	*antarcticum*	Lineage III	New Zealand	South Island	Johnson	212	9-Mar-93	CHR
EK475	*Sphagnum*	*antarcticum*	Lineage III	New Zealand	South Island	Andrus	114	2006	BING
EK1006	*Sphagnum*	*antarcticum*	Lineage III	New Zealand	South Island	Fife	10237	25-Jan-94	CHR
EK1009	*Sphagnum*	*antarcticum*	Lineage III	New Zealand	South Island	Johnson	213	10-Mar-93	CHR
EK196	*Sphagnum*	*antarcticum*	Lineage III	New Zealand	South Island	Karlin	EK1744	17-Nov-05	DUKE
EK189	*Sphagnum*	*antarcticum*	Lineage III	New Zealand	South Island	Karlin	EK2012	20-Nov-05	DUKE
EK966	*Sphagnum*	*antarcticum*	Lineage III	New Zealand	South Island	Cave	1849	2012	HO
EK255	*Sphagnum*	*antarcticum*	Lineage III	New Zealand	South Island	Karlin	EK716	7-Nov-05	DUKE
EK261	*Sphagnum*	*antarcticum*	Lineage III	New Zealand	South Island	Karlin	EK717	8-Nov-05	DUKE
EK194	*Sphagnum*	*antarcticum*	Lineage III	New Zealand	South Island	Karlin	EK719	9-Nov-05	DUKE
EK1010	*Sphagnum*	*antarcticum*	Lineage III	New Zealand	South Island	Fife	9440	13-Feb-90	CHR
EK1011	*Sphagnum*	*antarcticum*	Lineage III	New Zealand	South Island	Buxton & Espie	sn	16-Oct-90	CHR
EK187	*Sphagnum*	*antarcticum*	Lineage III	New Zealand	South Island	Karlin	EK1306	13-Nov-05	DUKE
EK476	*Sphagnum*	*antarcticum*	Lineage III	New Zealand	South Island	Andrus	124	2006	BING
EK188	*Sphagnum*	*antarcticum*	Lineage III	New Zealand	South Island	Karlin	EK1307	13-Nov-05	DUKE
EK195	*Sphagnum*	*antarcticum*	Lineage III	New Zealand	South Island	Karlin	EK1214d	12-Nov-05	DUKE

Sphagnum fimbriatum

DNA #	Genus	Species	lineage	Country	State/Island	Collector	Collection	Date	Herbarium
EK687	*Sphagnum*	*fimbriatum*	—	Argentina	Tierra del Fuego Island	Morris	s.n.	26-Feb-08	NY
EK688	*Sphagnum*	*fimbriatum*	—	Chile	Hoste Island, TdF	Buck	47986	20-Jan-05	NY
EK689	*Sphagnum*	*fimbriatum*	—	Chile	Isla Grande de la Tierra	Buck	47772	16-Jan-05	NY

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Table S2. Raw numbers of alleles recovered (NA), the number of different alleles detected per individual (N_{WI}), and the percent of individuals having the corresponding N_{WI} (% of samples) per SSR marker study for the three lineages of the *Sphagnum ×australe s.l.* complex.
The mean NWI averaged across all five SSRs for each sample and then averaged across all samples in each lineage is also shown

Lineage III (n =26; mean N_{WI} = 2.72 ± 0.02)

Marker	N_A	N_{WI}	% of samples
SSR-1	3	3	91.3
		2	8.7
SSR-5	3	2	96.0
		1	4.0
SSR-7	6	4	100.0
SSR-18	6	3	92.3
		2	7.7
SSR-22	2	2	80.8
		1	19.2
	Mean N_{WI}	2.72	

Lineage I (n = 31; mean N_{WI} = 1.98 ± 0.01)

Marker	N_A	N_{WI}	% of samples
SSR-1	5	2	100.0
SSR-5	9	2	90.3
		1	9.7
SSR-7	5	3	100.0
SSR-18	5	3	100.0
SSR-22	1	1	100.0
	Mean N_{WI}	1.98	

Lineage II (n = 3; mean N_{WI} = 2.00 ± 0.00)

Marker	N_A	N_{WI}	% of samples
SSR-1	2	2	100.0
SSR-5	4	2	100.0
SSR-7	4	3	100.0
SSR-18	3	2	100.0
SSR-22	1	1	100.0
	Mean N_{WI}	2.00	

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Table S3. SSR alleles sorted into parental genomes associated with the *Sphagnum* ×*australe* complex (R/S and F).

Unpublished SSR data for *S. strictum s.l.* makes it possible to assign each allele to its associated monoploid genome at SSR-1 and SSR-18 (Karlin unpublished data)

		20 SSRs														
		1			5			7				18			22	
Sample	Lineage	R	S	F	R or S	R or S	F	R or S	R or S	R or S	F	R	S	F	R and/or S	F
EK255	III	252	259	248	190	202	—	165	167	179	175	126	135	141	96	89
EK261	III	252	259	248	190	202	—	165	167	179	175	126	135	141	96	89
EK194	III	252	259	248	190	202	—	165	167	179	175	126	135	141	96	89
EK188	III	252	259	248	190	188	—	165	167	177	175	126	135	141	0	89
EK196	III	252	259	248	190	202	—	165	167	179	175	126	132	141	96	89
EK470	III	252	259	248	190	200	—	165	167	179	175	129	132	148	96	89
EK471	III	252	259	248	190	202	—	165	167	177	175	126	132	141	96	89
EK473	III	252	259	248	190	202	—	165	167	177	175	126	0	141	96	89
EK474	III	252	259	248	190	200	—	165	167	179	175	126	132	141	96	89
EK475	III	0	259	248	190	200	—	165	167	179	175	126	132	141	96	89
EK476	III	252	259	248	190	202	—	165	167	171	175	126	132	141	0	89
EK1004	III	252	259	248	190	202	—	165	167	177	175	126	132	141	96	89
EK1007	III	252	259	248	190	188	—	165	167	177	175	126	135	141	0	89
EK955	III	252	259	248	190	202	—	165	167	177	175	129	132	141	96	89
Minimum no. founders		**1**	**1**	**1**	**1**	**3**		**1**	**1**	**2**	**1**	**2**	**2**	**2**	**1**	**1**
EK467	I	252	261		205	202		165	167	179		126	132		96	
EK629	I	252	261		190	188		165	167	177		126	132		96	
EK956	I	252	259		190	202		165	167	179		126	132		96	
EK959	I	252	259		196	202		165	167	177		126	132		96	
EK960	I	252	270		190	204		165	167	177		126	132		96	
EK961	I	252	261		190	202		165	167	179		126	132		96	
EK962	I	252	261		190	200		165	167	177		126	132		96	
EK971	I	252	261		194	188		165	167	177		126	132		96	
EK974	I	252	261		194	202		165	167	179		126	132		96	
EK975	I	252	261		190	188		165	167	179		126	135		96	
EK976	I	252	259		190	202		165	167	177		126	—	148	96	
EK963	I	252	259		190	190		165	167	179		126	129		0	
EK978	I	252	268		194	202		165	167	179		126	132		96	
EK990	I	252	255		190	188		165	167	179		126	132		96	
EK977	I	252	270		198	188		165	167	179		126	132		96	
EK989	I	252	259		190	188		165	167	179		126	132		96	
EK191	I	252	259		190	202		165	167	179		126	132		96	
EK258	I	252	259		190	202		165	167	177		126	132		96	
EK967	I	252	261		190	202		165	167	179		126	132		96	
EK968	I	252	261		190	0		165	167	179		126	132		96	
EK982	Chatham Island	—	—		0	188		163	0	179		126	135		96	
EK193	II	252	254		196	186		163	172	197		0	138	141	96	
EK247	II	252	254		194	186		163	172	203		0	132	141	96	
EK687	*S. fimbriatum*			248			0				175			141		96
EK688	*S. fimbriatum*			248			0				175			141		96
EK689	*S. fimbriatum*			248			0				175			141		96

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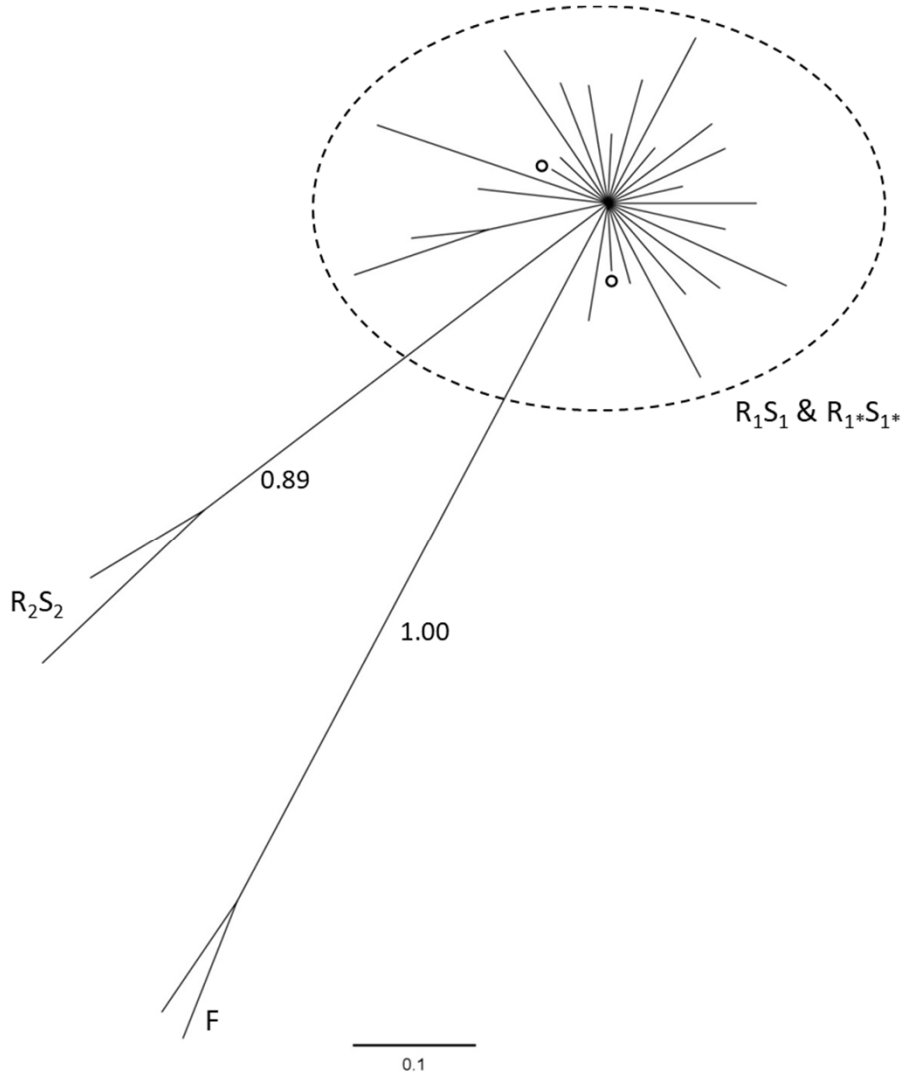

Figure S1. Tree based on Bayesian MCMC analysis showing the allelic divergence among the respective RS genomes of the members *S.* × *australe s.l.* complex, with the F monoploid genome of $FR_1{*}S_1{*}$ being included as an outgroup. The two $R_1{*}S_1{*}$ haplotypes shared with some R_1S_1 samples are indicated by degree symbols. Based on the genetic diversity between pairwise comparisons (D_{AI}) of samples.