

Supplementary Tables

Supplementary Table S1. The taxon, origin, ploidy level, maternal lineage, sample code and genbank accession number information of samples used in the nrDNA (ITS) study.

Taxon	Origin	Ploidy level	Maternal lineage*	Sample code	Gen bank accession number
<i>F. rothmaleri</i>	Spain	28	C5	SPLV-7	MK483100
<i>F. rothmaleri</i>	Spain	42	C5	SPLV-9	MK483089
<i>F. rothmaleri</i>	Spain	42	C4	SPPOR-12	MK483096
<i>F. rothmaleri</i>	Spain	28	C4	SPGD-8	MK483092
<i>rubra x arctica</i>	N-Finland	42	C1	RBS3-11	MK483094
<i>F. rubra ssp. arctica</i>	Greenland	42	C2	GL2-16	MK483087
<i>rubra x arctica</i>	S-Finland	42	C1	HA1-29	MK483090
<i>F. rubra ssp. arctica</i>	S-Finland	42	C1	HA2-32	MK483097
<i>F. rubra ssp. arctica</i>	N-Finland	56	C1	MS1K-26	MK483099
<i>rubra x arctica</i>	N-Finland	42	C1	MS2K-24	MK483098
<i>F. rubra ssp. rubra</i>	N-Finland	42	C1	MS2K-49	MK483095
<i>F. rubra ssp. rubra</i>	N-Finland	42	C1	RBS2-31	MK483101
<i>F. rubra ssp. arctica</i>	N-Finland	42	C1	RBS1-21	MK483093
<i>F. rubra ssp. rubra</i>	Faroe Islands	42	C2	FAS4-27	MK483091
<i>F. rubra ssp. rubra</i>	Iceland	42	C2	ICE1-33	MK483088

*see supplementary table 2

Supplementary Table S2. Numbers of individuals across *Festuca rubra* taxa and *F. rothmaleri* and six genetic clusters (K=6) obtained by BAPS software among the sampling sites.

<i>F. rubra subsp. arctica</i>							
	N	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5	Cluster 6
Faroe Islands	2	1	0	0	0	1	0
Iceland	2	2	0	0	0	0	0
Greenland	9	9	0	0	0	0	0
S Finland	9	0	0	0	2	1	6
N Finland	44	2	1	3	0	0	38
Total	66	14	1	3	2	2	44
<i>F. rubra subsp. rubra</i>							
	N	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5	Cluster 6
Faroe Islands	14	10	0	2	0	1	1
Iceland	1	1	0	0	0	0	0
S Finland	7	0	0	0	0	0	7
N Finland	8	0	2	0	0	0	6
Total	30	11	2	2	0	1	14
<i>rubra × arctica</i>							
	N	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5	Cluster 6
Faroe Islands	3	3	0	0	0	0	0
S Finland	7	0	0	0	0	0	7
N Finland	11	0	1	1	0	0	9
Total	21	3	1	1	0	0	16
<i>F. rothmaleri</i>							
	N	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5	Cluster 6
Spain	19	0	0	0	8	11	0
Altogether							
	N	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5	Cluster 6
Altogether	136	28	4	6	10	14	74

Supplementary Table S3. The characteristics of the thirteen chloroplast microsatellite loci used to study the genetic structure of *Festuca rubra complex*.

		locus16	locus21	locus19	locus31	locus27	locus29	locus26	locus30	locus15	locus17	locus20	locus24	locus28	
<i>subsp. arctica</i>	N	66	66	66	66	66	66	66	66	66	66	66	66	66	66
	Na	6	7	3	6	3	3	4	3	4	8	8	9	3	3
	Ne	1,571	1,335	1,889	1,331	1,130	1,063	1,807	1,130	1,097	1,430	2,672	1,804	1,656	1,656
	I	0,786	0,635	0,769	0,593	0,263	0,157	0,770	0,263	0,235	0,758	1,358	1,004	0,664	0,664
	uh	0,369	0,255	0,478	0,253	0,117	0,060	0,454	0,117	0,090	0,305	0,635	0,453	0,402	0,402
<i>subsp. rubra</i>	N	30	30	30	30	30	30	30	30	30	30	30	29	30	30
	Na	5	5	4	6	3	3	4	5	4	5	10	5	4	4
	Ne	1,424	1,424	2,432	2,103	1,145	1,226	2,432	1,424	1,320	1,536	4,688	1,832	2,432	2,432
	I	0,673	0,673	1,012	1,109	0,291	0,389	1,012	0,673	0,531	0,766	1,849	0,953	1,012	1,012
	uh	0,308	0,308	0,609	0,543	0,131	0,191	0,609	0,308	0,251	0,361	0,814	0,470	0,609	0,609
<i>rubra x arctica</i>	N	21	21	21	21	21	21	21	21	21	21	21	21	21	21
	Na	3	4	3	3	2	2	3	3	2	4	6	3	3	3
	Ne	1,340	1,349	1,615	1,215	1,100	1,100	1,800	1,340	1,100	1,349	3,835	1,615	1,639	1,639
	I	0,501	0,567	0,668	0,381	0,191	0,191	0,780	0,501	0,191	0,567	1,550	0,668	0,709	0,709
	uh	0,267	0,271	0,400	0,186	0,095	0,095	0,467	0,267	0,095	0,271	0,776	0,400	0,410	0,410
<i>F. rothmaleri</i>	N	19	18	19	19	19	19	19	19	19	19	19	19	19	19
	Na	3	5	4	5	2	4	3	3	2	4	5	5	3	3
	Ne	1,383	3,057	1,563	2,756	1,111	2,674	2,888	2,329	1,111	2,391	4,813	4,247	2,798	2,798
	I	0,537	1,292	0,734	1,236	0,206	1,114	1,080	0,959	0,206	1,060	1,590	1,500	1,060	1,060
	uh	0,292	0,712	0,380	0,673	0,105	0,661	0,690	0,602	0,105	0,614	0,836	0,807	0,678	0,678

Na = Number of Different Alleles

Ne = Number of Effective Alleles = 1 / (Sum pi^2)

I = Shannon's Information Index = -1 * Sum (pi * Ln (pi))

uh = Unbiased Diversity by locus = (N / (N-1)) * h

Where pi is the frequency of the ith allele for the population & Sum pi^2 is the sum of the squared population allele frequencies.

Supplementary Table S4. Principal components with scaling for continuous morphological traits of *Festuca rubra sensu lato* in the common garden.

	PC1	PC2	PC3	PC4	PC5	PC6	PC7	PC8	PC9
PlantHeight	0.1170405	-0.64035391	0.05398906	0.2907515	-0.0069533	0.374199	-0.57424518	0.10207688	0.092449
StolonLength	0.2187796	0.23056858	0.55144112	0.2280977	0.72955663	-0.041946	-0.07760963	0.0456572	-0.02716
InflorescenceLength	0.2820022	-0.51009943	0.15886138	0.3026261	-0.06964	-0.085599	0.67550784	-0.15694723	-0.22435
SpicleotLength	0.4588647	0.04593467	-0.10461765	0.1997735	-0.144254	-0.502978	-0.10395734	-0.10395767	0.66413
LemmaLength	0.4533198	0.13827591	-0.2616093	0.1229507	-0.1101367	-0.285875	-0.23609945	0.40504319	-0.61495
AwnLength	0.1135615	-0.44891273	0.10095741	-0.7655305	0.23774955	-0.343573	-0.06324092	0.10379494	-0.00345
LowerGlumeLength	0.44154	0.12762785	-0.0972059	-0.2268609	0.01753934	0.553959	0.31735338	0.48668932	0.288237
UpperGlumeLength	0.4581641	0.1204304	-0.19451041	-0.2236244	0.08307877	0.298114	-0.13894544	-0.7347297	-0.1812
BasalLeafWidth	0.1583917	0.15178394	0.72862951	-0.1712174	-0.6051241	0.048912	-0.13168101	-0.02298913	-0.07226