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Appendices

APPENDIX 1. List of all sample used for molecular analyses and morphological studies analyses. DNA, herbarium location Herb., voucher information, collection date, geographic origin, original label and GenBank accession numbers *rps4-trnI*, *trnL-trnF*, *trnH-psbA*, *rps19-rpl2*, *rpoB*, nrITS of the specimens included in the study.

Voucher	species	Herb.	collector and number	date of collection	Locality	original label	<i>rps4-trnI</i>	<i>trnL-trnF</i>	<i>trnH-psbA</i>	<i>rps19-rpl2</i>	<i>rpoB</i>	ITS
1	<i>D. acutifolium</i>	UUH	Krivobokov 262	12.07.2000	RU Buryatia	<i>D. bardunovii</i>	KJ796621	KJ796598	KJ796531	-	KJ796572	JN897272
4	<i>D. fragilifolium</i>	MW	Churakova s.n.	03.07.2001	RU Arkhangels Province	<i>D. fragilifolium</i>	-	KM502760	KM502638	-	KM502705	FJ952597
5	<i>D. bardunovii</i>	MW	Ivanova s.n.	01.08.1991	RU Yakutia	<i>D. bardunovii</i>	KJ796622	KJ796599	KJ796532	-	KJ796573	JN897273
9	<i>D. bardunovii</i>	MW	Volatovskiy s.n.	20.06.1985	RU SouthYakutia	<i>D. bardunovii</i>	-	KJ796600	KJ796533	-	-	JN897274
12	<i>D. fragilifolium</i>	MW	Ignatov & Ignatova s.n.	12.08.2001	RU Vologda Province	<i>D. fragilifolium</i>	KM502604	KM502761	KM502639	-	KM502706	FJ952596
13	<i>D. flexicaule</i>	KRF	Molokova s.n.	23.07.1995	RU Tuva	<i>Dicranum</i> sp.	KJ796606	KJ796581	KJ796513	-	KJ796555	HQ830328
15	<i>D. flexicaule</i>	KRF	Omyukova s.n.	29.07.1991	RU Krasnoyars Territory	<i>Dicranum</i> sp.	-	KJ796582	KJ796514	-	KJ796556	HQ830330
16	<i>D. flexicaule</i>	IRK	Dudareva s.n.	04.08.2006	RU Zabaikalsk Territory	<i>Dicranum</i> sp.	KJ796607	KJ796583	KJ796515	-	KJ796557	HQ830331
17	<i>D. flexicaule</i>	MHA	Ignatov 06-2637	s.d.	RU Primorsky Territory	<i>Dicranum</i> sp.	-	KJ796584	-	-	KJ796558	HQ830332
18	<i>D. fuscescens</i>	MHA	Bezgodov & Shkaraba s.n.	31.07.2005	RU Perm Province	<i>D. fuscescens</i>	-	KJ796578	KJ796510	-	KJ796552	HQ830334
19	<i>D. fuscescens</i>	MHA	Ignatov 06-2588	03.09.2006	RU Primorsky Territory	<i>D. fuscescens</i>	KJ796605	KJ796579	KJ796511	-	KJ796553	HQ830337
20	<i>D. brevifolium</i>	MW	Egorov s.n.	27.07.1996	RU Karachaevo-Cherkessia	<i>D. brevifolium</i>	KJ796611	KJ796587	KJ796520	-	KJ796563	HQ830342
21	<i>D. brevifolium</i>	KRF	Omyukova s.n.	12.06.2007	RU Tuva	<i>D. brevifolium</i>	KJ796612	KJ796588	KJ796521	KJ796629	KJ796564	HQ830341
23	<i>D. septentrionale</i>	LE	Neshataeva 986	04.08.2007	RU Kamchatka	<i>D. septentrionale</i>	KJ796608	KJ796585	KJ796516	KJ796627	KJ796559	HQ830338
24	<i>D. fuscescens</i>	MHA	Ignatov 06-14	20.08.2006	RU Sakhalin	<i>D. fuscescens</i>	-	KJ796580	KJ796512	-	KJ796554	HQ830335
25	<i>D. septentrionale</i>	MW	Churakova 864	19.07.2000	RU Arkhangels Province	<i>D. septentrionale</i>	-	KJ796586	KJ796517	-	KJ796560	HQ830339
26	<i>D. brevifolium</i>	MW	Korotkov s.n.	06.09.2002	RU NorthOssetia	<i>D. brevifolium</i>	-	KJ796589	KJ796522	KJ796630	KJ796565	HQ830343
1_II	<i>D. bardunovii</i>	UUH	Krivobokov 262	12.07.2000	RU Buryatia	<i>D. bardunovii</i> holotype	KJ796620	KJ796597	KJ796530	KJ796638	-	KJ796547
Aleu_1	<i>D. howellii</i>	UBC	Talbot TAN1C-17	16.08.2002	US Alaska, Aleutian-Island	<i>D. scoparium</i>	-	KF423914	KF423447	-	KF423658	-
Aleu_2	<i>D. majus</i>	UBC	Talbot & Schofield ADA42-29	24.08.2006	US Alaska, Sea Parrot Island	<i>D. scoparium</i>	KF423824	KF423915	KF423448	KF423752	KF423659	KF423553
Alk_1	<i>D. majus</i>	UBC	Talbot & Salomesch 05-41-18	07.07.2005	US Alaska, Northwest Arctic borough	<i>D. scoparium</i>	KF423825	KF423916	KF423449	KF423753	KF423660	KF423554

Voucher	species	Herb.	collector and number	date of collection	Locality	original label	rps4-trnT	trnL-trnF	trnH-psbA	rps19-rpl2	rpoB	ITS
Alk_2	<i>D. flexicaule</i>	L	Morgado & Gemi Bry- 280712 001	28.07.2012	US Alaska	<i>Dicranum</i> sp.	KJ651000	KJ651051	KJ650824	-	KJ650907	KJ650849
Alk_3	<i>D. flexicaule</i>	L	Morgado & Gemi Bry- 280712 002	28.07.2012	US Alaska	<i>Dicranum</i> sp.	KJ651001	KJ651052	KJ650825	-	KJ650908	KJ650850
Alk_4	<i>D. flexicaule</i>	L	Morgado & Gemi Bry- 280712 003	28.07.2012	US Alaska	<i>Dicranum</i> sp.	KJ651002	KJ651053	KJ650826	-	KJ650909	KJ650851
Alk_5	<i>D. flexicaule</i>	L	Morgado & Gemi Bry- 280712 004	28.07.2012	US Alaska	<i>Dicranum</i> sp.	KJ651003	KJ651054	KJ650827	-	KJ650910	KJ650852
Alk_6	<i>D. flexicaule</i>	L	Morgado & Gemi Bry- 280712 005	28.07.2012	US Alaska	<i>Dicranum</i> sp.	KJ651004	KJ651055	KJ650828	-	KJ650911	KJ650853
Alk_7	<i>D. flexicaule</i>	L	Morgado & Gemi Bry- 280712 006	28.07.2012	US Alaska	<i>Dicranum</i> sp.	KJ651005	KJ651056	KJ650829	-	KJ650912	KJ650854
Ast1011	<i>D. scoparium</i>	FCO-Brief	Fdez. Ordóñez 269	24.10.2001	ES Asturias	<i>D. scoparium</i>	KF423826	KF423917	KF423450	KF423754	KF423661	KF423555
Ast2011	<i>D. scoparium</i>	FCO-Brief	Fdez. Ordóñez 1077	22.02.2002	ES Asturias	<i>D. scoparium</i>	KF423827	KF423918	KF423451	KF423755	KF423662	KF423556
Ast3011	<i>D. scoparium</i>	FCO-Brief	del Collado 3784-1	01.08.2002	ES Asturias	<i>D. scoparium</i>	KF423828	KF423919	KF423452	KF423756	KF423663	KF423557
Ast3021	<i>D. scoparium</i>	FCO-Brief	del Collado 2993-1	27.07.1999	ES Asturias	<i>D. scoparium</i>	KF423829	KF423920	KF423453	KF423757	KF423664	KF423558
Ast3031	<i>D. scoparium</i>	FCO-Brief	del Collado 3744-1	18.08.2005	ES Asturias	<i>D. scoparium</i>	KF423830	KF423921	KF423454	KF423758	KF423665	KF423559
AT_2	<i>D. muelhlenbeckii</i>	L	van Melick 208859	s.d.	AT Steiermark	<i>D. muelhlenbeckii</i>						
AT_3	<i>D. drummondii</i>	L	van Melick 212270	06.07.1973	AT Tirol	<i>D. muelhlenbeckii</i>						
Atlu_1	<i>D. majus</i>	UBC	Schofield & Talbot 120253	15.09.2002	US Alaska, Atlu Island	<i>D. scoparium</i>	-	KF423922	KF423455	KF423759	KF423666	KF423560
BC_1	<i>D. scoparium</i>	UBC	Schofield & Klinkenberg 119252	24.03.2002	CA British Columbia, Lulu Island	<i>D. scoparium</i>	KF423898	KF423997	KF423536	-	-	KF423644
BC_2	<i>D. scoparium</i>	UBC	Schofield & Williams 117252A	18.05.2001	CA British Columbia, Lac les Jeune Road	<i>D. scoparium</i>	KF423899	KF423998	KF423537	-	-	KF423645
BCo1	<i>D. scoparium</i>	NY	Buck 54100	19.09.2008	CA Ontario, Bruce Co.	<i>D. scoparium</i>	KF423831	KF423923	KF423456	KF423760	KF423667	KF423561
BUL_1	<i>D. scoparium</i>	L	Papp 10/101/1	06.08.2010	BG Sofia Prov.	<i>D. scoparium</i>	KF423832	KF423924	KF423457	KF423761	KF423668	KF423562

Voucher	species	Herb.	collector and number	date of collection	Locality	original label	rps4-trnT	trnL-trnF	trnH-psbA	rps19-rpl2	rpoB	ITS
Cauc_1	<i>D. scoparium</i>	S	Ignatov & Ignatova B113001	12.09.2005	RU Karachaevo-Cherkessian Rep.	<i>D. scoparium</i>	KF423833	KF423925	KF423458	KF423762	KF423669	KF423563
CH1	<i>D. brevifolium</i>	S	Hedenäs B98890	14.08.2004	CH Canton Wallis	<i>D. brevifolium</i>	KJ651039	KJ651095	KJ650837	KJ650990	KJ650953	KJ650895
Ch_1011	<i>D. scoparium</i>	G	Lang 20080907.1	07.09.2008	CH Canton Geneva	<i>D. scoparium</i>	GQ428082	GQ428036	GQ427991	GQ427953	GQ427914	KF423564
Ch_1061	<i>D. scoparium</i>	G	Lang 20080907.6	07.09.2008	CH Canton Geneva	<i>D. scoparium</i>	GU068393	GU068477	GU068448	GU068364	GU068422	KF423565
CH_4	L		Greven s.n.	28.07.1990	CH Canton Wallis	<i>D. muehlenbeckii</i>	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX
Cor_1	<i>D. scoparium</i>	S	Sofiaux & Sotiaux 462	25.05.2004	FR Haute-Corse	<i>D. scoparium</i>	KF423834	KF423926	KF423459	KF423763	KF423670	KF423566
Dac	<i>D. acutifolium</i>	L	Stech B970831.1	31.08.1997	FI Kuusamo Prov.	<i>D. acutifolium</i>	KJ651030	DQ462590	KJ650818	KJ650981	KJ650941	KJ650881
DB_1	<i>D. scoparium</i>	MO	King & Garvey B657	05.10.2001	CA Nova Scotia, Richmond Co.	<i>D. bonjeanii</i>	KF423835	KF423927	KF423460	KF423764	KF423671	-
DB_2	<i>D. cf. scoparium</i>	MO	Davis 270	12.08.2007	US Pennsylvania, Cambria Co.	<i>D. bonjeanii</i>	GU068416	GU068500	GU068471	GU068387	GU068443	KF423567
DB_3	<i>D. scoparium</i>	MO	Weber, Wittmann, Andrus & Cooper B-111031	12.08.1996	US Colorado, San Juan Co.	<i>D. bonjeanii</i>	-	KM502773	KM502649	-	-	KM502686
DB_4	<i>D. scoparium</i>	MO	Allen 28704	09.09.2003	CA Newfoundland, Avalon Peninsula	<i>D. bonjeanii</i>	GU068418	GU068502	GU068473	GU068389	GU068445	KF423568
Db_CA	<i>D. scoparium</i>	L	Allen 9479	13.08.1990	CA Ontario, Thunder-bay district	<i>D. bonjeanii</i>	-	KF423999	KF423538	-	-	KF423646
Dbe	<i>D. undulatum</i>	L	Stech B970824.2	24.08.1997	FI North Karelia Prov.	<i>D. bergeri</i>	KJ796626	KJ796604	KJ796537	-	KJ796577	KJ796551
Dbr	<i>D. septentrionale</i>	L	Stech B960801.2	01.08.1996	AT Tirol	<i>D. brevifolium</i>	KJ796610	DQ462591	KJ796519	KJ796628	KJ796562	KJ796539
Dcan	<i>D. canariense</i>	L	Stech 04-405	2004	SP Canaries Islands	<i>D. canariense</i>	KM502596	KM502749	KM502627	KM502722	KM502702	KM502664
Dcan2	<i>D. canariense</i>	L	Stech 04-547	2004	SP Canaries Islands	<i>D. canariense</i>	KM502597	KM502750	KM502628	KM502723	KM502703	KM502665
Dcan3	<i>D. canariense</i>	L	07-113	2004	SP Canaries Islands	<i>D. canariense</i>	KM502598	KM502751	KM502629	KM502724	KM502704	KM502666
Ddr	<i>D. drummondii</i>	L	Stech B970827.4	27.08.1997	FI Kuusamo Prov.	<i>D. drummondii</i>	KJ796609	DQ462589	KJ796518	-	KJ796561	KJ796538
Ddrumm	<i>D. drummondii</i>	S	Hedenäs, Ohlsson, Odelvik & Myrdal B122041	s.d.	SE Härjedalen							
DE_1	<i>D. muehlenbeckii</i>	L	van Melick 202606	s.d.	DE Baden-Württemberg	<i>D. muehlenbeckii</i>						

Voucher	species	Herb.	collector and number	date of collection	Locality	original label	rps4-trnT	trnL-trnF	trnH-psbA	rps19-rpl2	rpoB	ITS
DE_2	<i>D. dispersum</i>	S	Sauer MS95022	12.05.1995	DE Baden-Württemberg	<i>D. dispersum</i>	KJ651041	KJ651097	KJ650839	KJ650992	KJ650955	KJ650897
Del	<i>D. elongatum</i>	L	Stech B970831.3	31.08.1997	FI Kuusamo Prov.	<i>D. elongatum</i>	KJ651031	DQ462592	KJ650819	KJ650982	KJ650942	KJ650882
Dfl	<i>D. flexicaule</i>	L	Stech B970827.5	27.08.1997	FI Kuusamo Prov.	<i>D. flexicaule</i>	KJ651032	-	KJ650820	-	KJ650943	KJ650883
Dfla1	<i>D. flagellare</i>	L	Wondergem 1300	07.10.2010	NL Utrecht	<i>D. flagellare</i>	KM502601	KM502757	KM502635	KM502727	-	KM502672
Dfla2	<i>D. flagellare</i>	L	Bijlsma 12053	16.05.2009	NL Limburg	<i>D. flagellare</i>	KM502602	KM502758	KM502636	KM502728	-	KM502673
Dfla3	<i>D. flagellare</i>	L	Bijlsma 13104	12.02.2011	NL Gelderland	<i>D. flagellare</i>	KM502603	KM502759	KM502637	KM502729	-	KM502674
Dfus6	<i>D. fuscescens</i>	L	Wondergem 1134	21.05.2009	NL Gelderland	<i>D. fuscescens</i>	KJ651042	KJ651098	KJ650840	KJ650993	-	KJ650898
Dfus7	<i>D. fuscescens</i>	L	Stech B970824.3	24.08.1997	FI Karelia Prov.	<i>D. fuscescens</i>	KF423896	-	KF423534	KF423819	KF423742	KF423642
Dfus8	<i>D. fuscescens</i>	L	Stech B970824.3	24.08.1997	FI Karelia Prov.	<i>D. fuscescens</i>	KM502619	KM502781	KM502656	KM502742	KM502714	KM502694
DH_3	<i>D. howellii</i>	MO	Allen 24114	24.03.2002	US California, Mendocino Co.	<i>D. howellii</i>	KF423840	KF423928	KF423465	-	-	KF423569
DH_5	<i>D. howellii</i>	MO	Shevock 19290	29.04.2000	US California, San Francisco Co.	<i>D. howellii</i>	KF423841	KF423929	KF423466	KF423769	KF423676	KF423570
Dib	<i>D. majus</i>	L	Stech B970829.4	29.08.1997	FI Kuusamo Prov.	<i>D. bonjeanii</i>	KF423836	AF135048/ AF136076	KF423461	KF423765	KF423672	AF144114
Dic_1644	<i>D. acutifolium</i>	L	Stech & Kruijer 10-102a	04.08.2010	NO Svalbard	<i>D. acutifolium</i>	KJ651006	KJ651057	KJ650789	KJ650961	KJ650913	KJ650855
Dic_1645	<i>D. spodiaceum</i>	L	Stech & Kruijer 08-203	14.07.2008	NO Svalbard	<i>D. angustum</i>	KJ651007	KJ651058	KJ650790	KJ650962	KJ650914	KJ650856
Dic_1646	<i>D. elongatum</i>	L	Stech & Kruijer 08-250	15.07.2008	NO Svalbard	<i>D. elongatum</i>	KJ651008	KJ651059	KJ650791	KJ650963	KJ650915	KJ650857
Dic_1648	<i>D. elongatum</i>	L	Stech & Kruijer 09-072	28.06.2009	NO Svalbard	<i>D. elongatum</i>	KJ651022	KJ651060	KJ650809	-	KJ650932	-
Dic_1649	<i>D. acutifolium</i>	L	Stech & Kruijer 10-118	04.08.2010	NO Svalbard	<i>D. elongatum</i>	KJ651009	KJ651061	KJ650792	KJ650964	KJ650916	KJ650858
Dic_1650	<i>D. elongatum</i>	L	Stech & Kruijer 10-202	07.08.2010	NO Svalbard	<i>D. elongatum</i>	-	KJ651062	KJ650793	-	KJ650917	KJ650859
Dic_1651	<i>D. laevidens</i>	L	Stech & Kruijer 10-216	07.08.2010	NO Svalbard	<i>D. groenlandicum</i>	KJ651010	KJ651063	KJ650794	KJ650965	KJ650918	KJ650860
Dic_1652	<i>D. laevidens</i>	L	Stech & Kruijer 10-002	01.08.2010	NO Svalbard	<i>D. laevidens</i>	KJ651011	KJ651064	KJ650795	-	KJ650919	KJ650861

Voucher	species	Herb.	collector and number	date of collection	Locality	original label	<i>rps4-trnT</i>	<i>trnL-trnF</i>	<i>trnH-psbA</i>	<i>rps19-rp2</i>	<i>rpoB</i>	ITS
Dic_ 1653	<i>D. laevidens</i>	L	Stech & Kruijer 10-006a	01.08.2010	NO Svalbard	<i>D. laevidens</i>	-	KJ651065	KJ650796	-	KJ650920	KJ650862
Dic_ 1654	<i>D. spodiaceum</i>	L	Stech & Kruijer 10-297	2010	NO Svalbard	<i>D. laevidens</i>	KJ651012	KJ651066	KJ650797	KJ650966	KJ650921	KJ650863
Dic_ 1655	<i>D. laevidens</i>	L	Stech & Kruijer 09-71	2009	NO Svalbard	<i>D. laevidens</i>	-	KJ651067	KJ650808	-	-	KJ650874
Dic_ 1659	<i>D. spodiaceum</i>	L	Stech & Kruijer 08-025	10.10.2012	NO Svalbard	<i>D. laevidens</i>	-	KJ651068	KJ650798	KJ650967	KJ650922	KJ650864
Dic_ 1660	<i>D. acutifolium</i>	L	Stech & Kruijer 08-031	11.07.2008	NO Svalbard	<i>D. laevidens</i>	KJ651013	KJ651069	KJ650799	KJ650968	KJ650923	KJ650865
Dic_ 1661	<i>D. acutifolium</i>	L	Stech & Kruijer 08-033a	11.07.2008	NO Svalbard	<i>D. laevidens</i>	KJ651014	KJ651070	KJ650800	KJ650969	KJ650924	KJ650866
Dic_ 1662	<i>D. laevidens</i>	L	Stech & Kruijer 09-021	28.06.2009	NO Svalbard	<i>D. laevidens</i>	KJ651015	KJ651071	KJ650801	-	KJ650925	KJ650867
Dic_ 1663	<i>D. laevidens</i>	L	Stech & Kruijer 09-022	28.06.2009	NO Svalbard	<i>D. laevidens</i>	KJ651016	KJ651072	KJ650802	-	KJ650926	KJ650868
Dic_ 1664	<i>D. majus</i>	L	Stech & Kruijer 10-029	01.08.2010	NO Svalbard	<i>D. laevidens</i>	KF423823	KF423913	KF423446	-	KF423657	KF423552
Dic_ 1665	<i>D. spodiaceum</i>	L	Stech & Kruijer 10-046	01.08.2010	NO Svalbard	<i>D. laevidens</i>	KJ651017	KJ651073	KJ650803	KJ650970	KJ650927	KJ650869
Dic_ 1666	<i>D. spodiaceum</i>	L	Stech & Kruijer 11-229	08.07.2011	NO Svalbard	<i>Dicranum</i> sp.	KJ651018	KJ651074	KJ650804	KJ650971	KJ650928	KJ650870
Dic_ 1667	<i>D. spodiaceum</i>	L	Stech & Kruijer 11-237	08.07.2012	NO Svalbard	<i>D. majus</i>	KJ651019	KJ651075	KJ650805	KJ650972	KJ650929	KJ650871
Dic_ 1668	<i>D. spodiaceum</i>	L	Stech & Kruijer 11-052	29.06.2011	NO Svalbard	<i>Dicranum</i> sp.	KJ651023	KJ651076	KJ650810	KJ650975	KJ650933	-
Dic_ 1669	<i>D. spodiaceum</i>	L	Stech & Kruijer 11-171	02.07.2011	NO Svalbard	<i>D. spodiaceum</i>	KJ651020	KJ651077	KJ650806	KJ650973	KJ650930	KJ650872
Dic_ 1670	<i>D. spodiaceum</i>	L	Stech & Kruijer 11-168	02.07.2011	NO Svalbard	<i>D. spodiaceum</i>	-	KJ651078	KJ650811	-	KJ650934	-
Dic_ 1671b	<i>D. spodiaceum</i>	L	Stech & Kruijer 11-167b	02.07.2011	NO Svalbard	<i>D. spodiaceum</i>	KJ651021	KJ651079	KJ650807	KJ650974	KJ650931	KJ650873
Dic_ 1671c	<i>D. spodiaceum</i>	L	Stech & Kruijer 11-167c	02.07.2011	NO Svalbard	<i>D. laevidens</i>	KJ651024	KJ651080	KJ650812	-	KJ650935	KJ650875

Voucher	species	Herb.	collector and number	date of collection	Locality	original label	rps4-trnT	trnL-trnF	trnH-psbA	rps19-rpl2	rpoB	ITS
Dic_1672	<i>D. laevidens</i>	L	Stech & Kruijer 11-0431	2011	NO Svalbard	<i>Dicranum</i> sp.	KJ651025	KJ651081	KJ650813	KJ650976	KJ650936	KJ650876
Dic_1673	<i>D. spadicum</i>	L	Stech & Kruijer 11-153	01.07.2011	NO Svalbard	<i>D. cf acutifolium</i>	KJ651026	KJ651082	KJ650814	KJ650977	KJ650937	KJ650877
Dic_1675	<i>D. elongatum</i>	L	Kruijer & Stech 11-213	07.07.2011	NO Svalbard	<i>D. elongatum</i>	KJ651027	KJ651083	KJ650815	KJ650978	KJ650938	KJ650878
Dic_1676	<i>D. acutifolium</i>	L	Stech & Kruijer 11-161	01.07.2011	NO Svalbard	<i>D. acutifolium</i>	KJ651028	KJ651084	KJ650816	KJ650979	KJ650939	KJ650879
Dic_1677	<i>D. spadicum</i>	L	Stech & Kruijer 11-165	02.07.2011	NO Svalbard	<i>D. laevidens</i>	KJ651029	KJ651085	KJ650817	KJ650980	KJ650940	KJ650880
Dif	<i>D. fragilifolium</i>	L	Stech B970827.1	27.08.1997	FI Kuusamo Prov.	<i>D. fragilifolium</i>	KF423837	AF1 35069/ AF1 36077	KF423462	KF423766	KF423673	AF1 40700
Dif2	<i>D. fragilifolium</i>	L	Stech B970828.8	28.08.1997	FI Kuusamo Prov.	<i>D. fragilifolium</i>	-	KM502762	-	-	-	KM502675
Dip	<i>D. polysetum</i>	L	Stech B9705181.1	18.05.1997	DE Mecklenburg-Vorpommern	<i>D. polysetum</i>	KF423838	AF1 29587	EU163523	KF423767	KF423674	AF1 44113
Dis	<i>D. scoparium</i>	L	Stech B960719.1	19.07.1997	DE Schleswig-Holstein	<i>D. scoparium</i>	KF423839	AF1 29588/ AF1 29561	KF423464	KF423768	KF423675	AF1 40699
Dtap_16	<i>D. scoparium</i>	MO	He 36007	10.08.2006	TW Eastern Taiwan	<i>D. japonicum</i>	KF423900	KF424000	KF423539	KF423820	KF423744	-
Dtap_17	<i>D. scoparium</i>	S	Mizutani 15102	28.10.1995	JP Honshu	<i>D. japonicum</i>	KF423901	KF424002	KF423541	-	-	KF423648
Dtap_5	<i>D. scoparium</i>	MO	He & Song 34527	13.07.2004	KR Jeju-do	<i>D. japonicum</i>	KF423902	KF424003	KF423542	-	KF423745	-
Dma	<i>D. scoparium</i>	L	Stech s.n.	1997	FI	<i>D. majus</i>	-	KJ651086	KJ650821	-	KJ650945	KJ650884
Dmont_1	<i>D. montanum</i>	L	Wundergem 1302	27.10.2010	NL North Holland	<i>D. montanum</i>	KM502606	KM502767	KM502644	KM502732	-	KM502680
Dmont_2	<i>D. montanum</i>	L	Zwarts 2033	03.12.2008	NL Gelderland	<i>D. montanum</i>	KM502607	KM502768	KM502645	KM502733	-	KM502681
Dmont_3	<i>D. montanum</i>	L	Smulders 10139	05.11.2010	NL North Brabant	<i>D. montanum</i>	KM502608	KM502769	KM502646	KM502734	-	KM502682
Dpol_1	<i>D. polysetum</i>	L	Wundergem 1355	25.01.2011	NL Utrecht	<i>D. polysetum</i>	KM502609	KM502770	KM502647	KM502735	-	KM502683
Dpol_2	<i>D. polysetum</i>	L	Zwarts 2121	28.02.2009	NL Gelderland	<i>D. polysetum</i>	KM502610	KM502771	KM502648	KM502736	-	KM502684
Dpol_3	<i>D. polysetum</i>	L	Aptroot 69434	31.08.2010	NL Overijssel	<i>D. polysetum</i>	KM502611	KM502772	-	KM502737	-	KM502685
Ddrum	<i>D. drummondii</i>	S	Hedenäs, Ohlsson, Odelvik & Myrdal B122041		SE Härjedalen	<i>D. drummondii</i>						
DS_04217	<i>D. scoparium</i>	L	Stech 04-217	28.07.2004	PT Madeira	<i>D. scoparium</i>	KF423844	KF423932	KF423469	KF423771	KF423678	KF423576

Voucher	species	Herb.	collector and number	date of collection	Locality	original label	rps4-trnT	trnL-trnF	trnH-psbA	rps19-rpl2	rpoB	ITS
DS_09317	<i>D. scoparium</i>	L	Stech 09-317	27.12.2009	DE Northrhine-West-phalia	<i>D. scoparium</i>	KF423845	KF423933	KF423470	KF423772	KF423679	KF423577
DS_09318	<i>D. scoparium</i>	L	Stech 09-318	27.12.2009	DE Northrhine-West-phalia	<i>D. scoparium</i>	KF423846	KF423934	KF423471	KF423773	KF423680	KF423578
DS_1	<i>D. cf. scoparium</i>	MO	Risk, Richardson & Newland 14,463	20.04.2007	US Kentucky, Greenup Co.	<i>D. scoparium</i>	GU068413	GU068497	GU068468	GU068384	GU068440	KF423571
DS_10009	<i>D. scoparium</i>	L	Stech 10-009	02.04.2010	DE Rhineland - Palatinate	<i>D. scoparium</i>	KF423847	KF423935	KF423472	KF423774	KF423681	KF423579
DS_2	<i>D. cf. scoparium</i>	MO	Allen 28074	10.06.2007	US Maine, Knox Co.	<i>D. scoparium</i>	GU068414	GU068498	GU068469	GU068385	GU068441	KF423572
DS_3	<i>D. cf. scoparium</i>	MO	Holmberg 1578	24.03.2006	US Missouri, Jefferson Co.	<i>D. scoparium</i>	GU068415	GU068499	GU068470	GU068386	GU068442	KF423573
DS_4	<i>D. majus</i>	MO	Talbot AT102-30	15.08.1999	US Alaska, Attu Island	<i>D. scoparium</i>	GU068421	GU068504	GU068476	GU068392	GU068447	KF423574
DS_5	<i>D. howellii</i>	MO	Allen 28834	26.03.2008	US Oregon, Multnomah Co.	<i>D. scoparium</i>	KF423843	KF423931	KF423468	KF423770	KF423677	KF423575
Dspa		L	Stech 8970828.9	28.08.1997	FI Kuusamo Prov.	<i>D. spadiceum</i>	-	KJ651087	KJ650822	-	-	KJ650886
Dspu	<i>D. spurium</i>	L	Stech			<i>D. spurium</i>	KW502615	KW502777	-	KW502738	KW502712	KW502690
Dspu_3	<i>D. spurium</i>	L	Bijlsma 13057	22.01.2011	NL Gelderland	<i>D. spurium</i>	KW502616	KW502778	KW502653	KW502739	-	KW502691
Dspu_4	<i>D. spurium</i>	L	Aptroot 69776	11.07.2011	NL Drenthe	<i>D. spurium</i>	KW502617	KW502779	KW502654	KW502740	-	KW502692
Dra	<i>D. tauricum</i>	L	Stech 8911228.3	28.12.1991	DE Nordrhein-Westfalen	<i>D. tauricum</i>	KJ651034	KJ651088	KJ650823	KJ650994	KJ650944	KJ650887
Dra_2	<i>D. tauricum</i>	L	Smulders 10140	05.11.2010	NL NorthBrabant	<i>D. tauricum</i>	KJ651043	KJ651099	KJ650841	KJ650995	-	KJ650899
Dra_3	<i>D. tauricum</i>	L	Pellicaan s.n.	22.04.2010	NL Utrecht	<i>D. tauricum</i>	KJ651044	KJ651100	KJ650842	KJ650996	-	KJ650900
Dra_4	<i>D. tauricum</i>	L	Buter 73747	13.07.2010	NL NorthBrabant	<i>D. tauricum</i>	KJ651045	KJ651101	KJ650843	KJ650997	-	KJ650901
FIN_1	<i>D. septentrionale</i>	S	Hedenäs & Bisang B194528	17.09.2010	FI Åland	<i>D. brevifolium</i>	KJ796619	KJ796596	KJ796529	KJ796637	KJ796571	KJ796546
FIN_2	<i>D. undulatum</i>	S	Hedenäs & Bisang B198289	25.05.2013	FI Åland	<i>D. undulatum</i>	KJ796623	KJ796601	KJ796534	KJ796639	KJ796574	KJ796548
FR_1	<i>D. scoparium</i>	L	Martinez s.n.	10.09.2008	FR Alpes-Maritimes	<i>D. scoparium</i>	KF423848	KF423936	KF423473	KF423775	KF423682	KF423580
FR_2	<i>D. bonjeanii</i>	L	Hovenkamp 10-43	01.08.2010	FR Savoie	<i>Dicranum</i> sp.	KF423849	KF423937	KF423474	-	KF423683	KF423581
FR_3	<i>D. bonjeanii</i>	L	Hovenkamp 10-47	01.08.2010	FR Savoie	<i>Dicranum</i> sp.	KF423850	KF423938	KF423475	KF423776	KF423684	KF423582
FR_4	<i>D. bonjeanii</i>	L	Hovenkamp 10-43	01.08.2010	FR Savoie	<i>Dicranum</i> sp.	KF423851	KF423939	KF423476	-	KF423685	KF423583

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GI_1011	<i>D. scoparium</i>	G	Lang & Price 20080701.1	01.07.2008	CH CantonVaud	<i>D. scoparium</i>	GQ428088	GQ428041	GQ427997	GQ427960	GQ427919	KF423584
GL1	<i>D. scoparium</i>	CANW	Ireland, Dugal & Ley 23775	22.06.1989	CA Ontario, Gloucester	<i>D. scoparium</i>	-	KF423940	KF423477	KF423777	KF423686	KF423585
GR_1	<i>D. scoparium</i>	L	Papp 10/77/6	15.07.2010	GR CentralMacedonia	<i>D. scoparium</i>	KF423852	KF423941	KF423478	KF423778	KF423687	KF423586
HUN_1	<i>D. scoparium</i>	UBC	Schofield 104660	31.08.1995	HU NorthernHU	<i>D. scoparium</i>	KF423853	KF423942	KF423479	KF423779	KF423688	KF423587
Is_1	<i>D. scoparium</i>	ICEL	Elmarsdóttir 42630	25.07.2001	IS Norðurlandeystra	<i>D. scoparium</i>	KF423854	KF423943	KF423480	KF423780	KF423689	KF423588
Is_10	<i>D. scoparium</i>	ICEL	Egglisson 44119	20.08.1997	IS Norðurlandvestra	<i>D. scoparium</i>	KF423862	KF423951	KF423488	KF423788	KF423697	KF423596
Is_2	<i>D. scoparium</i>	ICEL	Egglisson 44218	17.07.2003	IS Norðurlandeystra	<i>D. scoparium</i>	KF423855	KF423944	KF423481	KF423781	KF423690	KF423589
Is_3	<i>D. scoparium</i>	ICEL	Elmarsdóttir 44446	24.08.2004	IS Norðurlandeystra	<i>D. scoparium</i>	KF423856	KF423945	KF423482	KF423782	KF423691	KF423590
Is_4	<i>D. scoparium</i>	ICEL	Bórissón 43747	02.08.2002	IS Norðurland eystra	<i>D. scoparium</i>	KF423857	KF423946	KF423483	KF423783	KF423692	KF423591
Is_5	<i>D. spadiaceum</i>	ICEL	Egglisson 44012	12.08.2002	IS Norðurland vestra	<i>D. scoparium</i>	KF423858	KF423947	KF423484	KF423784	KF423693	KF423592
Is_7	<i>D. spadiaceum</i>	ICEL	Egglisson 43998	11.08.2002	IS Norðurland eystra	<i>D. scoparium</i>	KF423859	KF423948	KF423485	KF423785	KF423694	KF423593
Is_8	<i>D. spadiaceum</i>	ICEL	Egglisson 41447	12.08.2002	IS Norðurland eystra	<i>D. scoparium</i>	KF423860	KF423949	KF423486	KF423786	KF423695	KF423594
Is_9	<i>D. spadiaceum</i>	ICEL	Egglisson 43804	24.07.2002	IS Norðurland vestra	<i>D. scoparium</i>	KF423861	KF423950	KF423487	KF423787	KF423696	KF423595
Ka2031	<i>D. scoparium</i>	L	Lang 20091203.3	03.12.2009	NL Norðurland vestra	<i>D. scoparium</i>	KF423863	KF423952	KF423489	KF423789	KF423698	KF423597
KR9	<i>D. cf. japonicum</i>	JNU	Yoon s.n.	28.10.2011	KR Jeju-doHal lasan	<i>D. scoparium</i>	KF423866	KF423956	KF423493	KF423791	KF423702	KF423600
KR11	<i>D. cf. japonicum</i>	JNU	Yoon s.n.	19.05.2011	KR Jeollanam-do	<i>D. scoparium</i>	KF423867	KF423957	KF423494	-	KF423703	KF423601
KR12	<i>D. cf. japonicum</i>	JNU	Yoon s.n.	18.05.2011	KR Jeollanam-do	<i>D. scoparium</i>	KF423868	KF423958	KF423495	-	KF423704	KF423602
KR5	<i>D. cf. japonicum</i>	JNU	Yoon s.n.	08.03.2011	KR Jeollanam-do	<i>D. scoparium</i>	KF423864	KF423954	KF423491	-	KF423700	KF423598
KR7	<i>D. cf. japonicum</i>	JNU	Yoon s.n.	16.08.2010	KR Jeju-do	<i>D. scoparium</i>	KF423865	KF423955	KF423492	KF423790	KF423701	KF423599
L&A1	<i>D. scoparium</i>	CANW	Ley & al. 1222	11.07.1990	CA Ontario, Lennox & Addington Co.	<i>D. scoparium</i>	-	KF423959	KF423496	KF423792	KF423705	KF423603
MAC_1	<i>D. scoparium</i>	L	Papp 10/87/2	18.07.2010	MK Pelagonia region	<i>D. scoparium</i>	KF423869	KF423960	KF423497	KF423793	KF423706	KF423604
Mad_1	<i>D. scoparium</i>	S	Hedenäs B4566	14.06.1998	PT Madeira	<i>D. scoparium</i>	-	KF423961	KF423498	KF423794	KF423707	KF423605
Mad_2	<i>D. scoparium</i>	S	Hedenäs & Bisang B22461	20.11.1999	PT Madeira	<i>D. scoparium</i>	-	KF423962	KF423499	KF423795	-	KF423606
MS_04576	<i>D. scoparium</i>	L	Stech 04-576	08.08.2004	PT Madeira	<i>D. scoparium</i>	KF423870	KF423963	KF423500	KF423796	KF423708	KF423607

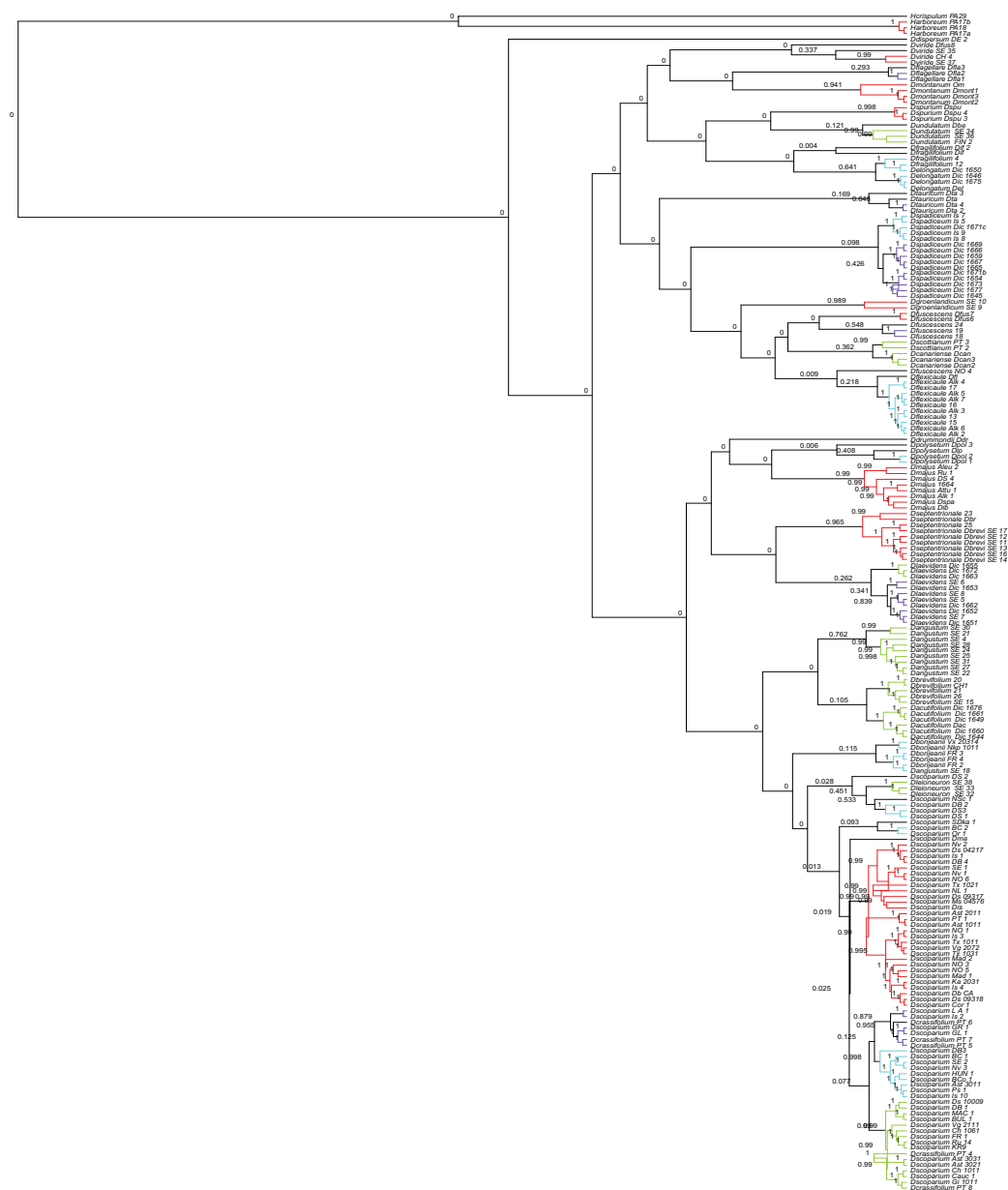
Voucher	species	Herb.	collector and number	date of collection	Locality	original label	rps4-trnT	trnL-trnF	trnH-psbA	rps19-rp2	rpoB	ITS
NB_1	<i>D. scoparium</i>	UBC	McAlpine s.n.	21.08.1990	CA New Brunswick, Charlotte Co.	<i>D. scoparium</i>	-	KF423964	KF423501	KF423797	KF423709	-
Nkp_1011	<i>D. bonjeanii</i>	L	Lang 20091126.2	26.11.2009	NL South Holland	<i>D. scoparium</i>	KF423871	KF423965	KF423502	KF423798	KF423710	KF423608
NL_1	<i>D. scoparium</i>	L	van den Vaart s.n.	2012	NL South Holland	<i>D. scoparium</i>	KF423872	KF423966	KF423503	KF423799	KF423711	KF423609
NO_1	<i>D. scoparium</i>	TRH	Prestø B-7239	18.04.2003	NO Herøy	<i>D. scoparium</i>	KF423873	KF423967	KF423504	KF423800	KF423712	KF423610
NO_3	<i>D. scoparium</i>	TRH	Hassel B-6584	13.04.2005	NO Gloppen	<i>D. scoparium</i>	-	KF423968	KF423505	-	KF423713	KF423611
NO_4	<i>D. fuscens</i>	TRH	Hassel s.n.	11.08.1998	NO Troms	<i>D. scoparium</i>	-	KF423969	KF423506	-	KF423714	KF423612
NO_5	<i>D. scoparium</i>	TRH	Prestø B-7017	31.05.2004	NO Gjemnes	<i>D. scoparium</i>	-	KF423970	KF423507	-	KF423715	KF423613
NO_6	<i>D. scoparium</i>	TRH	Prestø B-7605	30.05.2004	NO Frei	<i>D. scoparium</i>	KF423874	KF423971	KF423508	KF423801	KF423716	KF423614
NSc_1	<i>D. cf. scoparium</i>	UBC	Schofield & Schofield 95348	09.05.1990	CA Novascotia, Digby Co.	<i>D. scoparium</i>	-	KF424001	KF423540	-	-	KF423647
NV1	<i>D. scoparium</i>	O	Hanssen 3964/05	01.08.1996	NO Buskerud	<i>D. scoparium</i>	KF423875	KF423972	KF423509	KF423802	KF423717	KF423615
NV2	<i>D. scoparium</i>	O	Egan GE-20	18.04.2003	NO Østfold	<i>D. scottianum</i>	KF423876	KF423973	KF423510	KF423803	KF423718	KF423616
NV3	<i>D. scoparium</i>	O	Hanssen 5399	01.05.1999	NO Buskerud	<i>D. scoparium</i>	KF423877	KF423974	KF423511	KF423804	KF423719	KF423617
Om	<i>D. montanum</i>	L	Stech B890721.5	21.07.1989	DE Nordrhein-Westfalen	<i>D. montanum</i>	KF423878	AF1 29589/ AF1 29562	KF423512	KF423805	KF423720	AF1 4411 5
Or_1	<i>D. scoparium</i>	UBC	Schofield, Harpel & Forest Service Personnel 116776	10.10.2000	US Oregon, Umatilla National Forest	<i>D. scoparium</i>	KM502612	KM502774	KM502650	-	KM502710	KM502687
PA17a	<i>H. arboreum</i>	L	Stech PA17a	11	BR Parana, Município CampinaGrande do Sul	<i>Holomitrium</i>	KF423894	KF423994	KF423532	KF423818	KF423740	KF423640
PA17b	<i>H. arboreum</i>	L	Stech PA17b	11	BR Parana, Município CampinaGrande do Sul	<i>Holomitrium</i>	KF423893	KF423993	KF423531	-	KF423739	KF423639
PA18	<i>H. arboreum</i>	L	Stech PA18	11	BR Parana, Município CampinaGrande do Sul	<i>Holomitrium</i>	KF423895	KF423995	KF423533	-	KF423741	KF423641
PA29	<i>H. crispulum</i>	L	Stech PA29	11	BR Parana, Município CampinaGrande do Sul	<i>Holomitrium</i>	KF423892	KF423992	KF423530	-	KF423738	KF423638
PS1	<i>D. scoparium</i>	CANM	Ireland 23915	06.09.1989	CA Ontario, Parry Sound	<i>D. scoparium</i>	-	KF423975	KF423513	KF423806	KF423721	KF423618

Voucher	species	Herb.	collector and number	date of collection	Locality	original label	rps4-trnT	trnL-trnF	trnH-psbA	rps19-rpl2	rpoB	ITS
PT_1	<i>D. scoparium</i>	S	Hedenäs B44512	22.09.2000	PT Centro	<i>D. scoparium</i>	-	KF423976	KF423514	KF423807	KF423722	KF423619
PT_2	<i>D. scoparium</i>	Herb. H. Walthe	Walthe AZ-0102	09.08.2012	PT Azores	<i>Dicranum</i> sp.	KJ651046	KJ651102	KJ650844	-	KJ650956	KJ650902
PT_3	<i>D. scoparium</i>	Herb. H. Walthe	Frahm AZ-0184	10.08.2012	PT Azores	<i>Dicranum</i> sp.	KJ651047	KJ651103	KJ650845	-	KJ650957	KJ650903
PT_4	<i>D. scoparium</i>	LISU	Sérgio FRID 13g	25.11.2010	PT Trás-os-Montes e Alto Douro	<i>D. crassifolium</i>	KM502599	KM502752	KM502630	-	-	KM502667
PT_5	<i>D. scoparium</i>	LISU	Sérgio 13796	19.05.2006	PT Beira Litora	<i>D. crassifolium</i>	-	KM502753	KM502631	-	-	KM502668
PT_6	<i>D. scoparium</i>	LISU	Sérgio 14679	30.12.2010	PT Beira Alta	<i>D. crassifolium</i>	KM502600	KM502754	KM502632	KM502725	-	KM502669
PT_7	<i>D. scoparium</i>	LISU	Garcia 205276	26.06.2003	PT Douro Litoral	<i>D. crassifolium</i>	-	KM502755	KM502633	KM502726	-	KM502670
PT_8	<i>D. scoparium</i>	LISU	Sérgio, Carvalho, Garcia & Louro 212140	04.05.2004	PT Trás-os-Montes e Alto Douro	<i>D. crassifolium</i>	-	KM502756	KM502634	-	-	KM502671
Ru_1	<i>D. majus</i>	L	Lang 20100906.2	06.09.2010	RU Primorsky Prov.	<i>D. majus</i>	KF423879	KF423977	KF423515	KF423808	KF423723	KF423620
Ru_14	<i>D. scoparium</i>	L	van Melick 214110	18.09.2010	RU Irkutsk Prov.	<i>D. scoparium</i>	KM502613	KM502775	KM502651	-	KM502711	KM502688
Ru_16	<i>D. cf. larifolium</i>	L	Lang 20100910.8	11.09.2014	RU Primorsky Prov.	<i>D. scoparium</i>	KF423909	KF424010	KF423549	-	KF423750	KF423655
Ru_24	<i>D. cf. larifolium</i>	L	Lang 20100910.10	11.09.2014	RU Primorsky Prov.	<i>D. scoparium</i>	KF423910	KF424011	KF423550	-	KF423751	KF423656
Ru_27	<i>D. cf. larifolium</i>	L	Lang 20100909.9	10.09.2014	RU Primorsky Prov.	<i>D. scoparium</i>	KF423911	KF424012	KF423551	KF423821	-	-
Ru_3	<i>D. scoparium</i>	L	Lang 20100908.17	08.09.2010	RU Primorsky Prov.	<i>D. scoparium</i>	-	KF423979	KF423517	-	KF423725	KF423622
Ru_33	<i>D. cf. larifolium</i>	L	Lang 20100905.10	06.09.2014	RU Primorsky Prov.	<i>D. scoparium</i>	KF423907	KF424008	KF423547	-	-	KF423653
Ru_35	<i>D. cf. larifolium</i>	L	Lang & Cherdantseva 20100908.14	09.09.2014	RU Primorsky Prov.	<i>D. scoparium</i>	KF423906	KF424007	KF423546	-	KF423748	KF423652
Ru_4	<i>D. scoparium</i>	L	Lang 20100908.22	08.09.2010	RU Primorsky Prov.	<i>D. scoparium</i>	KF423881	KF423980	KF423518	KF423809	KF423726	KF423623
Ru_44	<i>D. cf. larifolium</i>	L	Lang 20100906.17	07.09.2014	RU Primorsky Prov.	<i>D. scoparium</i>	KF423904	KF424005	KF423544	-	KF423746	KF423650
Ru_46	<i>D. cf. larifolium</i>	L	Lang 20100906.6	07.09.2014	RU Primorsky Prov.	<i>D. scoparium</i>	KF423903	KF424004	KF423543	-	-	KF423649
Ru_49	<i>D. cf. larifolium</i>	L	Lang 20100906.11	07.09.2014	RU Primorsky Prov.	<i>D. scoparium</i>	KF423908	KF424009	KF423548	-	KF423749	KF423654
Ru_5_A	<i>D. nipponense</i>	L	Lang 20100909.1	09.09.2010	RU Primorsky Prov.	<i>D. bonjeonii</i>	KF423882	KF423981	KF423519	KF423810	KF423727	KF423624
Ru_5_B	<i>D. nipponense</i>	L	Lang 20100909.1	09.09.2010	RU Primorsky Prov.	<i>D. scoparium</i>	KF423883	KF423982	KF423520	KF423811	KF423728	KF423625
Ru_50	<i>D. cf. larifolium</i>	L	Lang 20100906.8	07.09.2014	RU Primorsky Prov.	<i>D. scoparium</i>	KF423905	KF424006	KF423545	-	KF423747	KF423651
Ru_6	<i>D. scoparium</i>	L	Lang 20100910.6	10.09.2010	RU Primorsky Prov.	<i>D. scoparium</i>	-	KF423983	KF423521	-	KF423729	KF423626

Voucher	species	Herb.	collector and number	date of col- lection	Locality	original label	rps4-trnT	trnL-trnF	trnH-psbA	rps19-rpl2	rpoB	ITS
Ru_7	<i>D. scoparium</i>	L	Lang 20100911.3	11.09.2010	RU Primorsky Prov.	<i>D. scoparium</i>	KF423884	KF423984	KF423522	-	KF423730	KF423627
Ru_8	<i>D. scoparium</i>	L	Lang 20100908.6	08.09.2010	RU Primorsky Prov.	<i>D. scoparium</i>	KF423885	KF423985	KF423523	-	KF423731	KF423628
SDak_1	<i>D. scoparium</i>	UBC	Churchill & Churchill 19597	18..8.1998	US South Dakota, Pennington Co.	<i>D. scoparium</i>	KM502614	KM502776	KM502652	-	-	KM502689
SE_1	<i>D. scoparium</i>	S	Odelvik B163166	12.04.2009	SE Gästrikland	<i>D. scoparium</i>	KF423886	KF423986	KF423524	KF423812	KF423732	KF423629
SE_10	<i>D. groenlandicum</i>	S	Hedenäs B74363	17.08.2002	SE Torne Lappmark	<i>D. groenlandicum</i>	-	KJ651089	KJ650830	KJ650984	KJ650946	KJ650888
SE_11	<i>D. septentrionale</i>	S	Hedenäs B74004	07.09.2002	SE Uppland	<i>D. brevifolium</i>	KJ796613	KJ796590	KJ796523	KJ796631	KJ796566	KJ796540
SE_12	<i>D. septentrionale</i>	S	Hedenäs B122921	10.07.2007	SE Härjedalen	<i>D. brevifolium</i>	KJ796614	KJ796591	KJ796524	KJ796632	KJ796567	KJ796541
SE_13	<i>D. septentrionale</i>	S	Hedenäs B183369	26.05.2011	SE Gotland	<i>D. brevifolium</i>	KJ796615	KJ796592	KJ796525	KJ796633	-	KJ796542
SE_14	<i>D. septentrionale</i>	S	Hedenäs B193369	26.07.2012	SE Södermanland	<i>D. brevifolium</i>	KJ796616	KJ796593	KJ796526	KJ796634	KJ796568	KJ796543
SE_15	<i>D. brevifolium</i>	S	Hedenäs B175744	21.05.2010	SE Hälsingland	<i>D. brevifolium</i>	KJ651040	KJ651096	KJ650838	KJ650991	KJ650954	KJ650896
SE_16	<i>D. septentrionale</i>	S	Hallingbäck 46166	07.08.2008	SE Tornelappmark	<i>D. brevifolium</i>	KJ796617	KJ796594	KJ796527	KJ796635	KJ796569	KJ796544
SE_17	<i>D. septentrionale</i>	S	Hedenäs & Bisang B84948	11.08.2003	SE Gotland	<i>D. brevifolium</i>	KJ796618	KJ796595	KJ796528	KJ796636	KJ796570	KJ796545
SE_18	S	S	Norin B132878	29.06.2002	SE Torne Lappmark	<i>D. angustum</i>	KM502595	KM502748	KM502626	KM502721	KM502701	KM502663
SE_2	<i>D. scoparium</i>	S	Hedenäs B164630	03.08.2009	SE Jämtland	<i>D. scoparium</i>	KF423887	KF423987	KF423525	KF423813	KF423733	KF423630
SE_21	<i>D. angustum</i>	S	Hedenäs, Rönblom, Odelvik & Hammede B139061	26.06.2012	SE Dalarna	<i>D. angustum</i>	KM502592	KM502744	KM502622	KM502717	KM502697	KM502659
SE_22	<i>D. angustum</i>	S	Hedenäs B193541	29.08.2012	SE Jämtland	<i>D. angustum</i>	KJ651036	KJ651092	KJ650834	KJ650987	KJ650950	KJ650892
SE_24	<i>D. angustum</i>	S	Westerberg B132876	25.08.2006	SE Norrbotten	<i>D. angustum</i>	KM502593	KM502745	KM502623	KM502718	KM502698	KM502660
SE_25	<i>D. angustum</i>	S	Hedenäs, Bisang & Persson B105001	09.09.2005	SE Jämtland	<i>D. angustum</i>	-	KJ651090	KJ650832	KJ650986	KJ650948	KJ650890
SE_27	<i>D. angustum</i>	S	Norin B132922	11.08.2002	SE Tornelappmark	<i>D. angustum</i>	KJ651037	KJ651093	KJ650835	KJ650988	KJ650951	KJ650893
SE_28	<i>D. angustum</i>	S	Johansson B132925	08.08.2006	SE Tornelappmark	<i>D. angustum</i>	KM502594	KM502746	KM502624	KM502719	KM502699	KM502661
SE_30	<i>D. angustum</i>	S	Hedenäs B107583	14.09.2009	SE Jämtland	<i>D. angustum</i>	-	KM502747	KM502625	KM502720	KM502700	KM502662
SE_31	<i>D. angustum</i>	S	Johansson B132926	08.07.2003	SE Tornelappmark	<i>D. angustum</i>	KJ651038	KJ651094	KJ650836	KJ650989	KJ650952	KJ650894
SE_32	<i>D. leioneuron</i>	S	Hedenäs B116708	06.10.2002	SE Medelpad	<i>D. leioneuron</i>	KJ651048	KJ651104	KJ650846	-	KJ650958	KJ650904
SE_33	<i>D. leioneuron</i>	S	Laagaard, Gustafsson, Poulsen, Brunbjerg 232001	23.05.2010	SE Hälsingland	<i>D. leioneuron</i>	KJ651049	KJ651105	KJ650847	KJ650998	KJ650959	KJ650905

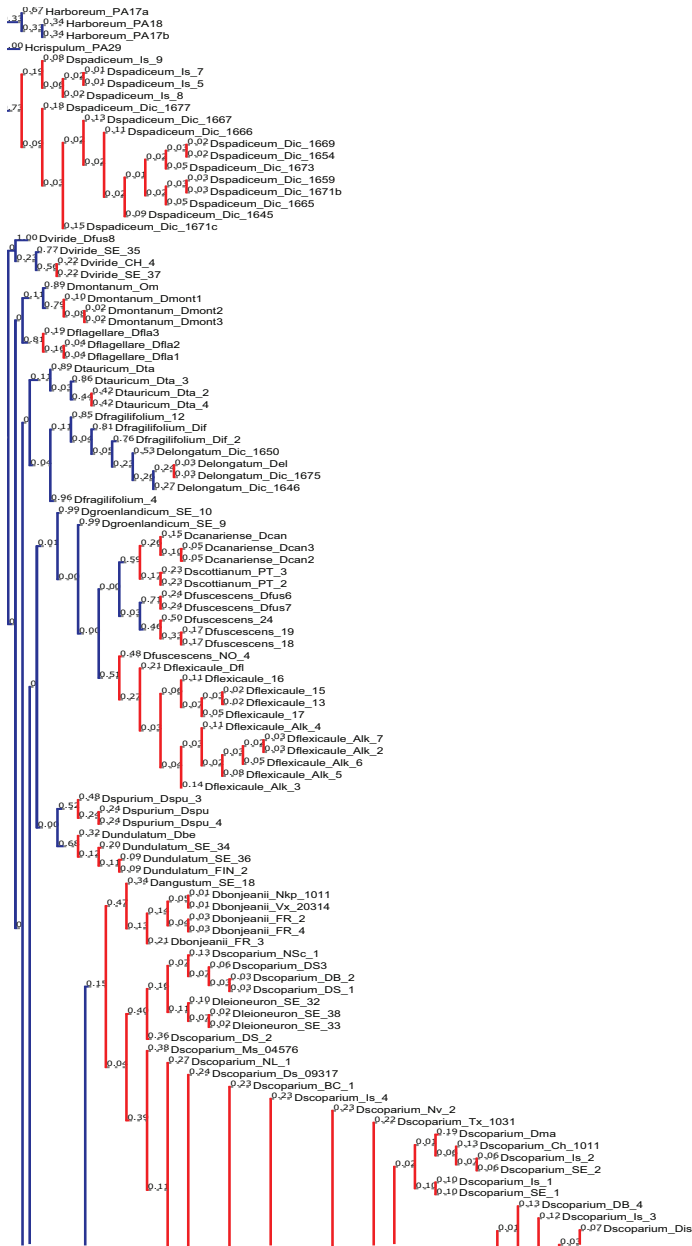
Voucher	species	Herb.	collector and number	date of collection	Locality	original label	rps4-trnT	trnL-trnF	trnH-psbA	rps19-rpl2	rpoB	ITS
SE_34	<i>D. undulatum</i>	S	Hedenäs, Odelvik & Rönblom B199960	12.09.2013	SE Ångermanland	<i>D. undulatum</i>	KJ796624	KJ796602	KJ796535	KJ796640	KJ796575	KJ796549
SE_35	<i>D. viride</i>	S	Hagström B172407	27.05.2009	SE Småland	<i>D. viride</i>	KM502620	KM502782	KM502657	KM502743	KM502715	KM502695
SE_36	<i>D. undulatum</i>	S	Hedenäs, Odelvik & Rönblom B199806	09.09.2013	SE Ångermanland	<i>D. undulatum</i>	KJ796625	KJ796603	KJ796536	KJ796641	KJ796576	KJ796550
SE_37	<i>D. viride</i>	S	Lönnell B48734	15.06.1999	SE Gotland	<i>D. viride</i>	KM502621	KM502783	KM502658	-	KM502716	KM502696
SE_38	<i>D. leioneuron</i>	S	Hedenäs & Persson B135011	07.05.2008	SE Dalarna	<i>D. leioneuron</i> KJ651050	KJ651050	KJ651106	KJ650848	KJ650999	KJ650960	KJ650906
SE_4	<i>D. angustum</i>	S	Norin B131031	06.08.2002	SE Torne Lappmark	<i>D. laevigens</i>	-	KJ651091	KJ650833	-	KJ650949	KJ650891
SE_5	<i>D. laevigens</i>	S	Westerberg B131027	13.07.2002	SE Lule Lappmark	<i>D. laevigens</i>	-	KM502764	KM502641	KM502730	KM502708	KM502677
SE_6	<i>D. laevigens</i>	S	Hedenäs, Bisang & Persson B105000	09.09.2005	SE Jämtland	<i>D. laevigens</i>	KJ651035	-	KJ650831	KJ650985	KJ650947	KJ650889
SE_7	<i>D. laevigens</i>	S	Hedenäs B85000	10.10.1995	SE Dalarna	<i>D. laevigens</i>	-	KM502765	KM502642	-	-	KM502678
SE_8	<i>D. laevigens</i>	S	Hedenäs B74327	21.09.2002	SE Jämtland	<i>D. laevigens</i>	KM502605	KM502766	KM502643	KM502731	KM502709	KM502679
SE_9	<i>D. groenlandicum</i>	S	Hedenäs B74365	21.09.2002	SE Jämtland	<i>D. groenlandicum</i>	-	KM502763	KM502640	-	KM502707	KM502676
Tx1011	<i>D. scoparium</i>	L	Lang 20100314.1	14.03.2010	NL North Holland	<i>D. scoparium</i>	KF423888	KF423988	KF423526	KF423814	KF423734	KF423631
Tx1021	<i>D. scoparium</i>	L	Lang 20100314.5	14.03.2010	NL North Holland	<i>D. scoparium</i>	KF423889	KF423989	KF423527	KF423815	KF423735	KF423632
Tx1031	<i>D. scoparium</i>	L	Lang 20100314.9	14.03.2010	NL North Holland	<i>D. scoparium</i>	KF423890	KF423990	KF423528	KF423816	KF423736	KF423633
Vg_2072	<i>D. scoparium</i>	G	Lang & Price 20070719.31	19.07.2007	CH Canton Geneva	<i>D. scoparium</i>	GU068406	GU068490	GU068461	GU068377	GU068434	KF423634
Vg_2111	<i>D. scoparium</i>	G	Lang & Price 20070719.35	19.07.2007	CH Canton Geneva	<i>D. scoparium</i>	GU068406	GU068490	GU068461	GU068377	GU068434	KF423634
Vx_20314	<i>D. bonjeanii</i>	G	Lang, Price & Naciri 20070523.21	23.05.2007	CH Canton Geneva	<i>D. bonjeanii</i>	GU068406	GU068490	GU068461	GU068377	GU068434	KF423634
Wa_1	<i>D. howellii</i>	UBC	Schofield & Harpel 120572	23.10.2002	US Washington, Snohomish Co.	<i>D. scoparium</i>	KF423891	KF423991	KF423529	KF423817	KF423737	KF423637

APPENDIX 2.

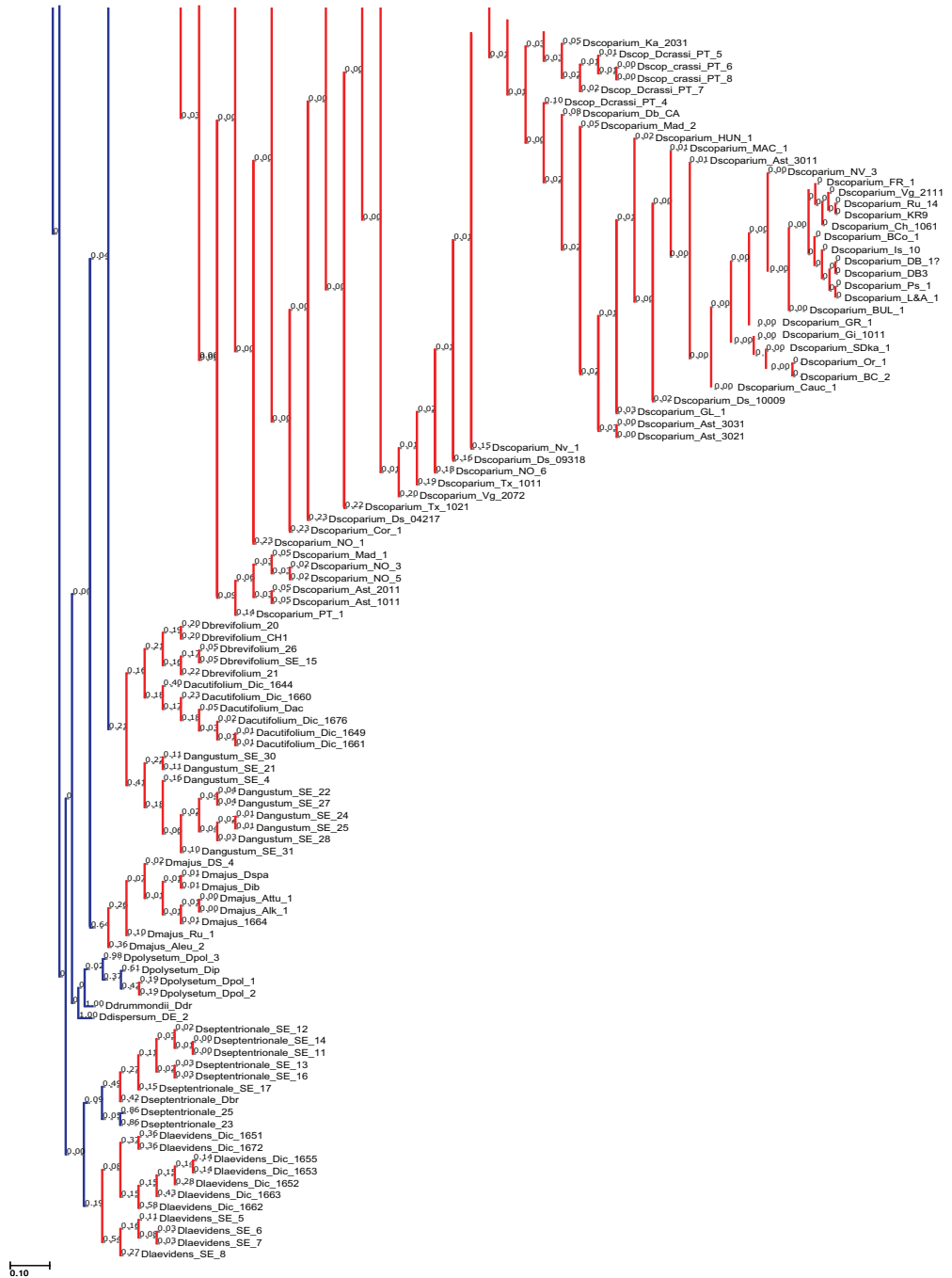


APPENDIX 2. General mixed Yules coalescent (GMYC) multiple threshold model from plastid and nuclear data. Branch length fitted a strict molecular clock, with estimated entities indicated in colors fitting the lineages-through-time plot for multiple GMYC thresholds.

APPENDIX 3.

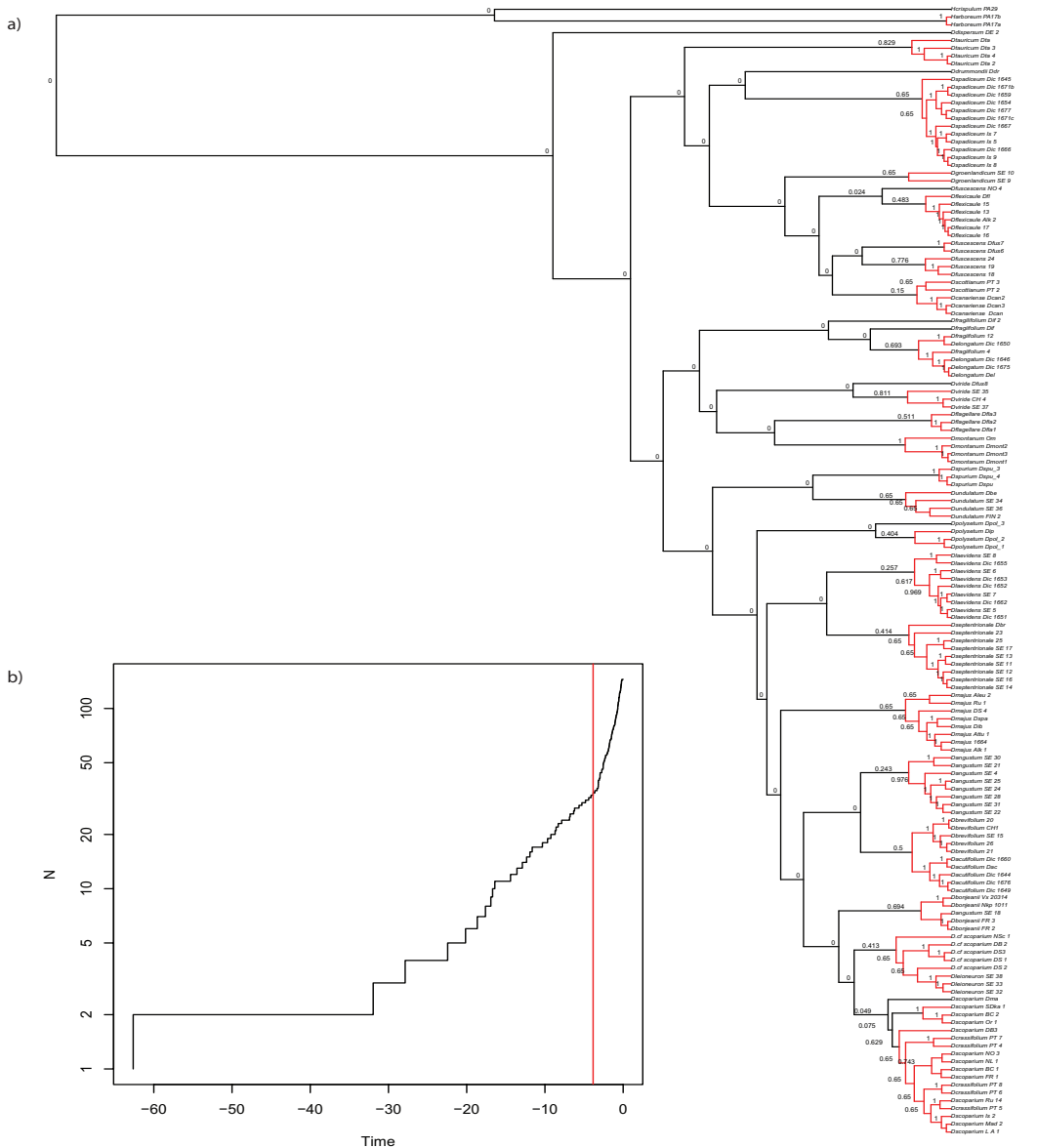


APPENDIX 3. PTP ML partitions obtained from <http://species.h-its.org/>. Species boundaries are indicated in red.



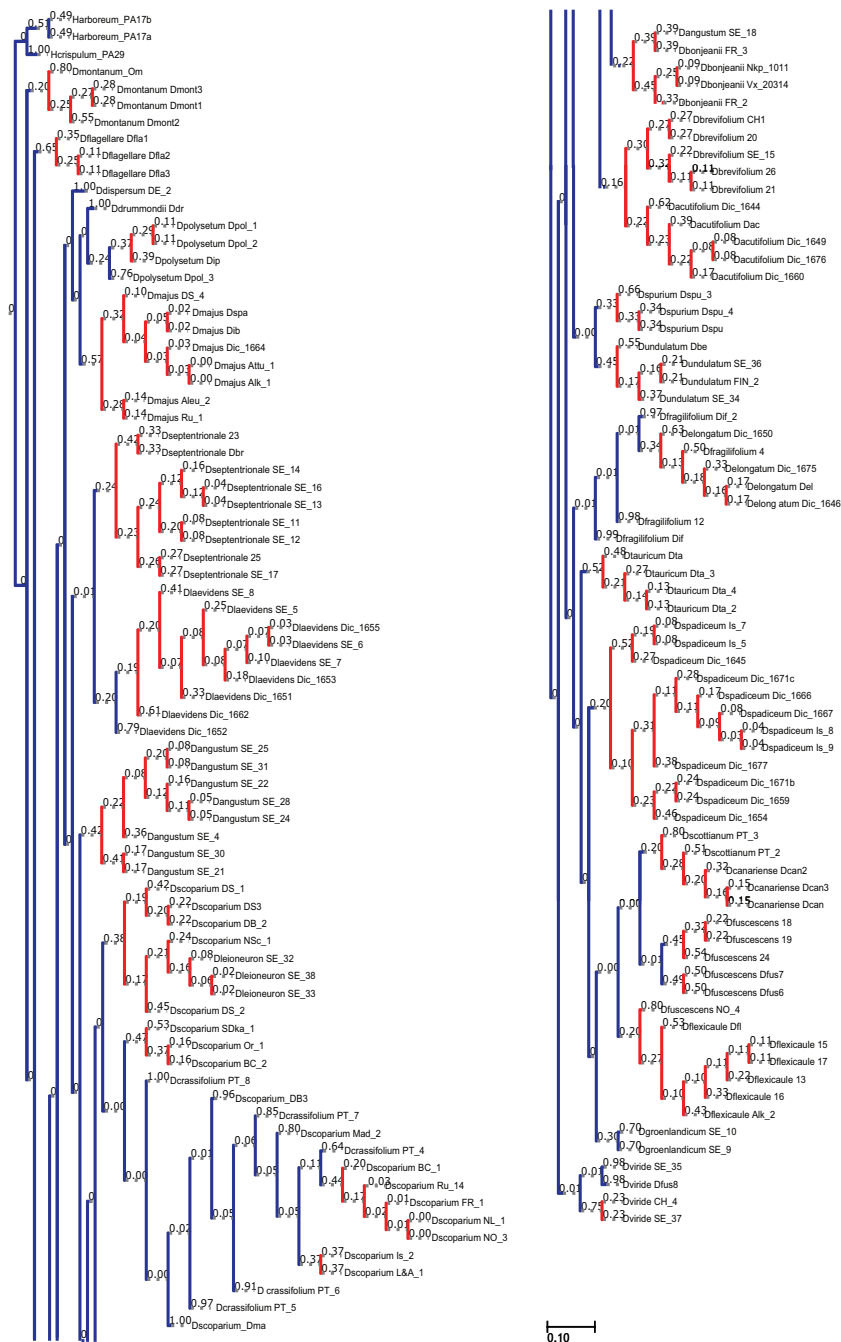
APPENDIX 3. suite

APPENDIX 4 GMYC tree obtained from a reduced dataset



GMYC ultrametric tree depicting species delimitation of 20 morpho-species *Dicranum* based on Bayesian analysis using a Yule model in BEAST and with fit of the general mixed Yules coalescent (GMYC) single threshold model from plastid and nuclear data. Branch length fitted a strict molecular clock, with estimated entities indicated in red. (a). Lineages-through-time plot for single (b) GMYC threshold is illustrated. The vertical red line represent the timing of the earliest coalescent event.

The figure displays a phylogenetic tree and a stratigraphic distribution plot. The tree, rooted on the left, shows the evolutionary relationships between various species, with bootstrap values indicated at the nodes. The species names are listed on the right, including *Dapadiceum* (e.g., *D. 1645*, *D. 1671b*, *D. 1659*, *D. 1654*, *D. 1677*, *D. 1671c*, *D. 1667*, *D. 1671*, *D. 1655*, *D. 1666*, *D. 1658*, *D. 1659*, *D. 1670*, *D. 1671*, *D. 1672*, *D. 1673*, *D. 1674*, *D. 1675*, *D. 1676*, *D. 1677*, *D. 1678*, *D. 1679*, *D. 1680*, *D. 1681*, *D. 1682*, *D. 1683*, *D. 1684*, *D. 1685*, *D. 1686*, *D. 1687*, *D. 1688*, *D. 1689*, *D. 1690*, *D. 1691*, *D. 1692*, *D. 1693*, *D. 1694*, *D. 1695*, *D. 1696*, *D. 1697*, *D. 1698*, *D. 1699*, *D. 1700*, *D. 1701*, *D. 1702*, *D. 1703*, *D. 1704*, *D. 1705*, *D. 1706*, *D. 1707*, *D. 1708*, *D. 1709*, *D. 1710*, *D. 1711*, *D. 1712*, *D. 1713*, *D. 1714*, *D. 1715*, *D. 1716*, *D. 1717*, *D. 1718*, *D. 1719*, *D. 1720*, *D. 1721*, *D. 1722*, *D. 1723*, *D. 1724*, *D. 1725*, *D. 1726*, *D. 1727*, *D. 1728*, *D. 1729*, *D. 1730*, *D. 1731*, *D. 1732*, *D. 1733*, *D. 1734*, *D. 1735*, *D. 1736*, *D. 1737*, *D. 1738*, *D. 1739*, *D. 1740*, *D. 1741*, *D. 1742*, *D. 1743*, *D. 1744*, *D. 1745*, *D. 1746*, *D. 1747*, *D. 1748*, *D. 1749*, *D. 1750*, *D. 1751*, *D. 1752*, *D. 1753*, *D. 1754*, *D. 1755*, *D. 1756*, *D. 1757*, *D. 1758*, *D. 1759*, *D. 1760*, *D. 1761*, *D. 1762*, *D. 1763*, *D. 1764*, *D. 1765*, *D. 1766*, *D. 1767*, *D. 1768*, *D. 1769*, *D. 1770*, *D. 1771*, *D. 1772*, *D. 1773*, *D. 1774*, *D. 1775*, *D. 1776*, *D. 1777*, *D. 1778*, *D. 1779*, *D. 1780*, *D. 1781*, *D. 1782*, *D. 1783*, *D. 1784*, *D. 1785*, *D. 1786*, *D. 1787*, *D. 1788*, *D. 1789*, *D. 1790*, *D. 1791*, *D. 1792*, *D. 1793*, *D. 1794*, *D. 1795*, *D. 1796*, *D. 1797*, *D. 1798*, *D. 1799*, *D. 1800*, *D. 1801*, *D. 1802*, *D. 1803*, *D. 1804*, *D. 1805*, *D. 1806*, *D. 1807*, *D. 1808*, *D. 1809*, *D. 1810*, *D. 1811*, *D. 1812*, *D. 1813*, *D. 1814*, *D. 1815*, *D. 1816*, *D. 1817*, *D. 1818*, *D. 1819*, *D. 1820*, *D. 1821*, *D. 1822*, *D. 1823*, *D. 1824*, *D. 1825*, *D. 1826*, *D. 1827*, *D. 1828*, *D. 1829*, *D. 1830*, *D. 1831*, *D. 1832*, *D. 1833*, *D. 1834*, *D. 1835*, *D. 1836*, *D. 1837*, *D. 1838*, *D. 1839*, *D. 1840*, *D. 1841*, *D. 1842*, *D. 1843*, *D. 1844*, *D. 1845*, *D. 1846*, *D. 1847*, *D. 1848*, *D. 1849*, *D. 1850*, *D. 1851*, *D. 1852*, *D. 1853*, *D. 1854*, *D. 1855*, *D. 1856*, *D. 1857*, *D. 1858*, *D. 1859*, *D. 1860*, *D. 1861*, *D. 1862*, *D. 1863*, *D. 1864*, *D. 1865*, *D. 1866*, *D. 1867*, *D. 1868*, *D. 1869*, *D. 1870*, *D. 1871*, *D. 1872*, *D. 1873*, *D. 1874*, *D. 1875*, *D. 1876*, *D. 1877*, *D. 1878*, *D. 1879*, *D. 1880*, *D. 1881*, *D. 1882*, *D. 1883*, *D. 1884*, *D. 1885*, *D. 1886*, *D. 1887*, *D. 1888*, *D. 1889*, *D. 1890*, *D. 1891*, *D. 1892*, *D. 1893*, *D. 1894*, *D. 1895*, *D. 1896*, *D. 1897*, *D. 1898*, *D. 1899*, *D. 1900*, *D. 1901*, *D. 1902*, *D. 1903*, *D. 1904*, *D. 1905*, *D. 1906*, *D. 1907*, *D. 1908*, *D. 1909*, *D. 1910*, *D. 1911*, *D. 1912*, *D. 1913*, *D. 1914*, *D. 1915*, *D. 1916*, *D. 1917*, *D. 1918*, *D. 1919*, *D. 1920*, *D. 1921*, *D. 1922*, *D. 1923*, *D. 1924*, *D. 1925*, *D. 1926*, *D. 1927*, *D. 1928*, *D. 1929*, *D. 1930*, *D. 1931*, *D. 1932*, *D. 1933*, *D. 1934*, *D. 1935*, *D. 1936*, *D. 1937*, *D. 1938*, *D. 1939*, *D. 1940*, *D. 1941*, *D. 1942*, *D. 1943*, *D. 1944*, *D. 1945*, *D. 1946*, *D. 1947*, *D. 1948*, *D. 1949*, *D. 1950*, *D. 1951*, *D. 1952*, *D. 1953*, *D. 1954*, *D. 1955*, *D. 1956*, *D. 1957*, *D. 1958*, *D. 1959*, *D. 1960*, *D. 1961*, *D. 1962*, *D. 1963*, *D. 1964*, *D. 1965*, *D. 1966*, *D. 1967*, *D. 1968*, *D. 1969*, *D. 1970*, *D. 1971*, *D. 1972*, *D. 1973*, *D. 1974*, *D. 1975*, *D. 1976*, *D. 1977*, *D. 1978*, *D. 1979*, *D. 1980*, *D. 1981*, *D. 1982*, *D. 1983*, *D. 1984*, *D. 1985*, *D. 1986*, *D. 1987*, *D. 1988*, *D. 1989*, *D. 1990*, *D.*



PTP ML partitions obtained from <http://species.h-its.org/>. Species boundaries are indicated in red.

