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Extensive clonal structure and high genetic diversity at peripheral populations of *Sorbus torminalis* (L.) Crantz.
iForest – Biogeosciences and Forestry. – doi: 10.3832/ifor1885-009

Supplementary Material

Table S1 Characteristics of 13 nuclear microsatellite loci studied in 172 individuals of *Sorbus torminalis (L.)* Crantz

Table S2 Details about the optimized multiplex-PCR reaction mixture

Table S3 Details about the clonal structure of 172 ramets assigned to 100 genets (geographic coordinates are given in the ETRS89/Poland CS92 coordinate system).

Figure S1 Spatial distribution of clonal groups in the fragment of population Rogozno. Different colors indicate ramets of the same clone.

Figure S2 Results of clustering of individuals of five populations into three clusters based on STRUCTURE and BAPS software.

Tab. S1 - Characteristics of 13 nuclear microsatellite loci studied in 172 individuals of *Sorbus torminalis (L.)* Crantz.

Locus	Forward primer	Reverse primer	Size (bp)	Size range	Cloned repeat	Dye	Temp of annealing [C°]	Species	Reference
Sa01	ATGGAGTTGAGCTCCACATC	GGTGGAGGGACAATTGTGTC	240	208-254	(GA)13	NED	60	*Sorbus aria*	Gonzalez-Gonzalez et al. 2010
SA07	ACGTTTTCAGTATGATGGCC	CTTCGCAGTTCATTAAGCAC	346	346-362	(GA)15	NED	60	*Sorbus aria*	Gonzalez-Gonzalez et al. 2010
SA14	ATGGATTTAGGTTAACAGTTGTC	GAGGTAAAACCTACCAGTATAC	170	150-215	(TC)30	VIC	57	*Sorbus aria*	Gonzalez-Gonzalez et al. 2010
Mss1	ATGTTCGGTAGTCATCCCCT	GCTCAGATAGCCACTCCCC	154	144-172	(GA) 15	VIC	59	*Sorbus torminalis*	Oddou Muratorio et al. 2001
Mss4	AAGTGGTATTTGAGGGTGGG	GTATGTAATGTGCCTTCGTGC	282	282-306	(GT = CA) 15	VIC	59	*Sorbus torminalis*	Oddou Muratorio et al. 2001
Mss5	CCCCAACAACATTTTTCTCC	CCTCTCGCTCTTTGCCTCT	125	117-145	(GA) 19	PET	60	*Sorbus torminalis*	Oddou Muratorio et al. 2001
Mss6	CGAAACTCAAAAACGAAATCAA	ACGGGAGAGAAACTCAAGACC	244	244-294	(GT = CA) 14	NED	56	*Sorbus torminalis*	Oddou Muratorio et al. 2001
Mss9	AAGTTTTCAAGCCATTTTCATT	CTTCACCATTTTTGTTGTGTGT	223	215-253	(CT = GA) 19	PET	57	*Sorbus torminalis*	Oddou Muratorio et al. 2001
Mss13	TATGCGTCTTTCCATTCCG	GCGTTTGACTCACTCAGATTTG	234	234-252	(CA)12	FAM	56	*Sorbus torminalis*	Oddou Muratorio et al. 2001
Mss16	CTCCCCTTGTGTGATGCC	TTGCCCTCAAAGAATGCC	171	151-203	(CT = GA) 28	NED	57	*Sorbus torminalis*	Oddou Muratorio et al. 2001
CH01h01	GAAAGACTTGCAGTGGGAGC	GGAGTGGGTTTGAGAAGGTT	112	98-128	(AG)25.5	FAM	60	*Malus*	Gianfranceschi et al. 1998
CH02c09	TTATGTACCAACTTTGCTAACCTC	AGAAGCAGCAGAGGAGGATG	237	231-245		FAM	60	*Malus domestica*	Liebhard et al. 2002
Ms14H03	CGCTCACCTCGTAGACGT	ATGCAATGGCTAAGCATA	119	113-131		FAM	50	*Malus domestica*	Liebhard et al. 2002

Tab. S2 - Details about the optimized multiplex-PCR reaction mixture
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Component	Concentration
Multiplex I	
Qiagen Multiplex PCR master mix (Qiagen)	1x
BSA	0,5 mg/ml
Ch01h01	75nM
Ch02c09	75nM
Mss4	100nM
Sa01	100nM
Sa07	200nM
Sa14	75nM
H_2O	1 µl
DNA	10 ng
Multiplex II	
Qiagen Multiplex PCR master mix (Qiagen)	1x
BSA	0,5 mg/ml
Mss1	40nM
Mss5	175nM
Mss6	100nM
Mss9	200nM
Mss13	100nM
Mss16	100nM
Ms14H03	100nM
H_2O	0,24 µl
DNA	10 ng

Tab. S3 - Details about the clonal structure of 172 ramets assigned to 100 genets. (geographic coordinates are given in the ETRS89/Poland CS92 coordinate system).

No.	Ramet ID	Genet ID	Population	Geographic coordinates	
				X	Y
1	429	429	2	494658.3397	634213.4017
2	430	430	2	494512.0134	634361.269
3	431	431	2	494594.8676	633647.146
4	432	432	2	494334.2855	633764.4545
5	433	433	2	494299.5678	633961.9104
6	434	434	2	494167.8748	634323.534
7	435	435	2	493546.523	634307.5496
8	436	437	1	489851.5119	635792.833
9	437		1	489848.328	635789.392
10	438		1	489843.8874	635786.2874
11	439	439	1	489859.4165	635775.7993
12	440	440	1	489869.3782	635761.3193
13	441		1	489868.2606	635764.7695
14	442	442	1	489869.1759	635790.3481
15	443	443	1	490100.0905	635801.0905
16	444	444	1	490681.6794	636449.6502
17	445	445	1	490617.0651	636465.5717
18	446	446	1	490066.6663	636614.7339
19	447	447	1	490055.807	636610.8641
20	448	448	1	490064.561	636589.0465
21	449	450	1	489119.9139	634842.7581
22	450		1	489121.5206	634850.651
23	451		1	489124.8407	634855.2034
24	452	452	1	489117.8312	632104.0953
25	453	453	1	490545.0005	637054.8476
26	454	454	1	490500.2488	637073.7338
27	455	455	1	490480.2327	637121.3763
28	456		1	490478.9176	637125.3829

No.	Ramet ID	Genet ID	Population	Geographic coordinates	
				X	Y
29	457	457	1	490547.5561	637240.3573
30	458	458	1	490544.2791	637288.6334
31	459	459	1	490199.7085	637115.3898
32	460	460	1	490152.2632	637047.5333
33	461	461	5	502524.5956	624236.1043
34	462	462	5	502541.3245	624214.7595
35	463	463	5	502671.1486	624218.0563
36	464		5	502672.6103	624214.0533
37	465		5	502667.5046	624209.8242
38	466		5	502673.0863	624193.4784
39	467	467	5	502664.6058	624174.0105
40	468	468	5	500518.7145	624747.8378
41	469	469	5	499405.1275	625202.8379
42	470	470	5	498175.5592	625989.3502
43	471	471	5	498174.5689	626000.6948
44	472	472	5	498167.9268	625973.2266
45	473	473	5	498384.1124	626361.0753
46	474	474	5	497847.4563	626471.3949
47	475	475	5	497589.2415	626316.0371
48	476	476	5	497271.4698	627093.7341
49	477	479	3	497100.8517	629850.3783
50	478		3	497088.0676	629857.1705
51	479		3	497085.4177	629857.9507
52	480		3	497084.0952	629862.289
53	481		3	497082.3732	629863.5135
54	482		3	497082.705	629864.403
55	483	483	3	496997.0086	629933.6346
56	484		3	496988.2679	629942.3152
57	485	485	3	497102.2408	629846.5961
58	486	486	3	497136.4895	629833.6738
59	487	487	3	497148.8773	629828.7727

No.	Ramet ID	Genet ID	Population	Geographic coordinates	
				X	Y
60	488		3	497149.1412	629826.8818
61	489	489	3	497157.4221	629824.2076
62	490		3	497163.385	629823.3143
63	491		3	497159.9361	629817.6442
64	492		3	497156.5544	629813.6424
65	493	493	3	497166.6933	629815.4158
66	494	494	3	497188.2176	629797.9416
67	495	495	3	497193.382	629791.1542
68	496		3	497193.382	629791.1542
69	497		3	497193.382	629791.1542
70	498		3	497191.6614	629794.8255
71	499		3	497195.5703	629794.0446
72	500		3	497198.3519	629791.8186
73	501		3	497198.3519	629791.8186
74	502		3	497198.3519	629791.8186
75	503		3	497198.3519	629791.8186
76	504		3	497200.2722	629789.5931
77	505		3	497195.1699	629789.3737
78	506		3	497194.5045	629784.5917
79	507		3	497196.1597	629782.3663
80	508		3	497204.971	629779.9143
81	509		3	497204.971	629779.9143
82	510		3	497204.971	629779.9143
83	511		3	497206.7	629779.9
84	512	512	3	497214.1818	629780.7986
85	513	513	3	497217.1628	629779.4622
86	514	514	3	497217.8889	629774.7906
87	515	515	3	497218.3511	629772.0099
88	516	516	3	497218.3511	629772.0099
89	517	517	3	497220.6006	629766.2252
90	518	518	3	497229.8091	629763.1057

No.	Ramet ID	Genet ID	Population	Geographic coordinates	
				X	Y
91	519	519	3	497230.0095	629765.9972
92	520	520	3	497227.4255	629766.2212
93	521	517	3	497219.9381	629766.5592
94	522	522	3	497250.727	629727.6148
95	523		3	497252.8444	629722.4975
96	524		3	497256.786262	629721.2162
97	525	525	3	497260.7281	629719.9349
98	526		3	497261.1919	629719.8234
99	527		3	497262.7121	629713.2606
100	528		3	497263.5051	629709.4788
101	529		3	497260.1931	629711.4826
102	531		3	497266.6833	629705.4731
103	532		3	497281.5166	629689.1154
104	530	530	3	497249.661	629717.6057
105	533	533	3	497336.9231	629708.6582
106	534	534	3	497326.5453	629636.3722
107	535	535	3	497336.7405	629619.9061
108	536	536	3	497276.4008	629205.9858
109	537		3	497275.1421	629206.7651
110	538	538	3	497256.9	629215.36
111	539		3	497252.8807	629215.3418
112	540		3	497250.92	629215.34
113	541		3	497251.3543	629211.5613
114	542	542	3	497222.4987	629275.8623
115	543		3	497222.4987	629275.8623
116	544		3	497222.4987	629275.8623
117	545	546	3	497212.1339	629342.4882
118	546		3	497212.1339	629342.4882
119	547		3	497210.9419	629343.8236
120	548		3	497209.156	629349.3855
121	549	549	3	497193.3946	629366.6337

No.	Ramet ID	Genet ID	Population	Geographic coordinates	
				X	Y
122	550	550	3	497186.5012	629363.8574
123	551		3	497186.0355	629360.7435
124	552	552	4	493289.0697	626658.9568
125	553	553	4	493288.7328	626655.1759
126	554	554	4	493366.1846	626802.0967
127	555		4	493361.3378	626797.3212
128	556	556	4	493413.8239	626731.073
129	557	557	4	493394.5713	626713.6386
130	558	558	4	493399.3548	626673.0374
131	559	559	4	493407.0375	626666.7985
132	560	560	4	493540.6361	626613.8966
133	561	561	4	493665.5119	626679.7911
134	562	562	4	493709.1592	626743.6831
135	563	563	4	493733.9285	626722.2964
136	564		4	493734.4553	626719.5152
137	565		4	493737.5064	626720.4009
138	566		4	493742.5472	626721.6176
139	567		4	493742.2786	626719.06
140	568	568	4	493759.763	626704.0224
141	569	569	4	493832.6772	626738.9604
142	570	570	4	493831.4693	626727.8401
143	571		4	493831.3973	626723.5027
144	573		4	493837.0974	626721.9382
145	572	572	4	493832.8537	626721.7213
146	574		4	493832.3866	626719.4976
147	575	575	4	493830.8608	626718.8323
148	576		4	493828.9359	626717.2777
149	577		4	493830.1928	626715.0517
150	578		4	493831.7831	626714.2711
151	580		4	493832.1825	626715.494
152	581	581	4	493893.1314	626727.3152

No.	Ramet ID	Genet ID	Population	Geographic coordinates	
				X	Y
153	582	582	4	493946.1598	626767.3966
154	583	583	4	493950.6839	626727.686
155	584	584	4	493949.0213	626723.7955
156	585	585	4	493949.8322	626735.6948
157	586	586	4	494001.9575	626743.8585
158	587	587	4	494960.3417	626769.8764
159	588		4	494960.3417	626769.8764
160	589	589	4	494978.4652	626791.211
161	590	590	4	495011.4148	626788.2844
162	591	591	4	495028.2508	626783.4843
163	592	592	4	495029.1384	626807.8401
164	593	593	4	494880.8405	627195.2595
165	594	594	4	494947.5071	627292.3923
166	595	595	4	495074.9756	627401.2514
167	596		4	495073.9819	627401.9197
168	597		4	495076.2993	627399.1369
169	598	598	4	495204.2054	627422.4723
170	599		4	495199.5609	627418.6956
171	600		4	495208.4515	627425.6933
172	601		4	495209.7831	627431.3641

Fig. S1 - Spatial distribution of clonal groups in the fragment of population Rogozno. Different colors indicate ramets of the same clone.

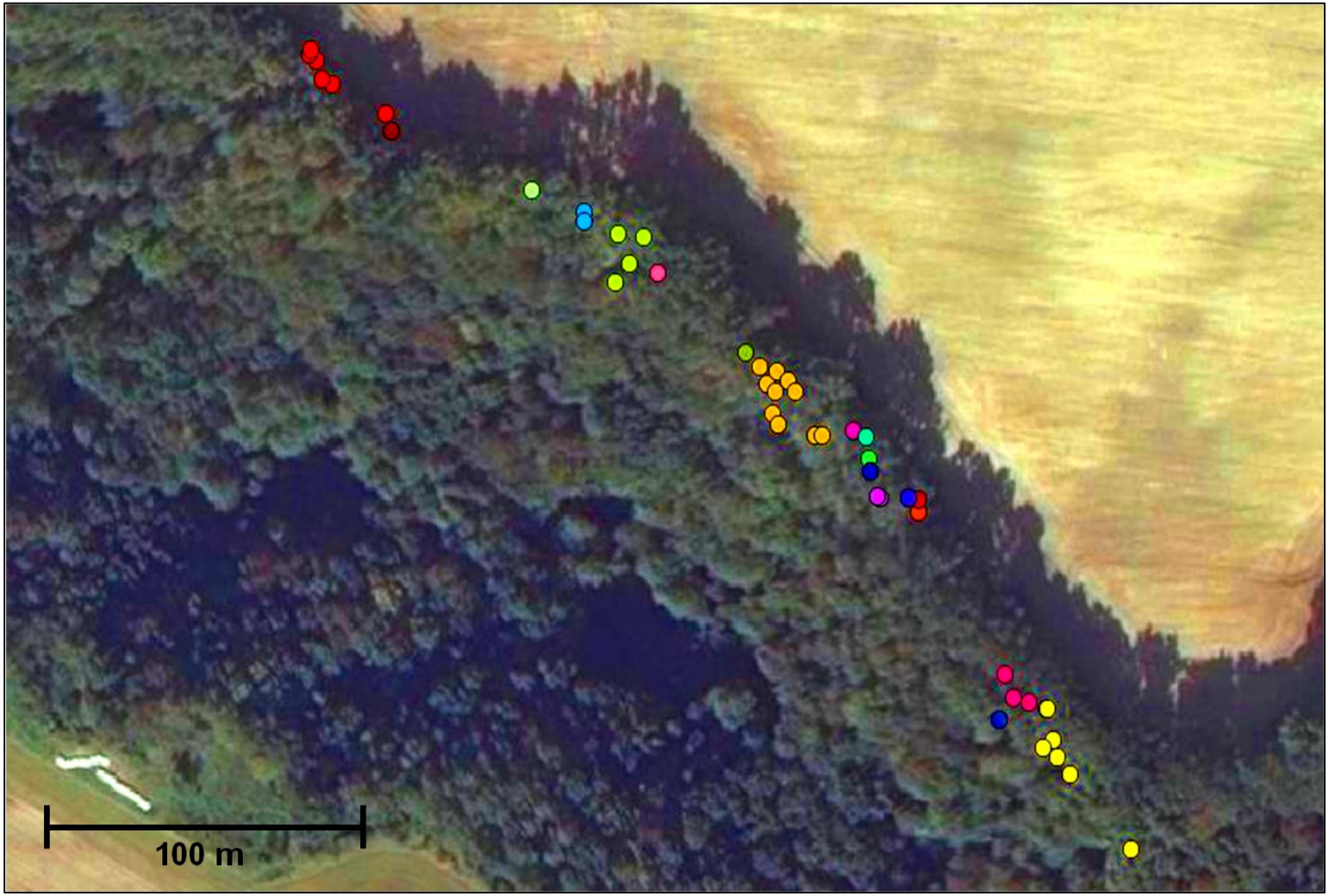

Fig. S2 - Results of clustering of individuals of five populations into three clusters based on STRUCTURE and BAPS software.