

Supplementary Table S1. Pairwise geographic distances (km) between the studied samples of *P. obovata*.

<i>Po_Kr</i>	<i>Po_Ch</i>	<i>Po_Gn</i>	<i>Po_Br</i>	<i>Po_Kg</i>	<i>Po_Os</i>	
0,000						<i>Po_Kr</i>
72	0,000					<i>Po_Ch</i>
208	136	0,000				<i>Po_Gn</i>
119	128	212	0,000			<i>Po_Br</i>
279	248	226	175	0,000		<i>Po-Kg</i>
355	348	357	236	136	0,000	<i>Po_Os</i>

Po_Kr, Po_Ch, Po_Gn, Po_Br, Po_Kg, Po_Os - sample designations

Supplementary Table S2. Pairwise geographic distances (km) between the studied samples of *L. sibirica*.

<i>Ls_Tl</i>	<i>Ls_Ih</i>	<i>Ls_Bn</i>	<i>Ls_Kr</i>	<i>Ls_Gn</i>	<i>Ls_Kh</i>	
0,000						<i>Ls_Tl</i>
14	0,000					<i>Ls_Ih</i>
188	174	0,000				<i>Ls_Bn</i>
142	131	68	0,000			<i>Ls_Kr</i>
319	305	132	192	0,000		<i>Ls_Gn</i>
260	260	275	215	361	0,000	<i>Ls_Kr</i>

Ls_Tl, Ls_Ih, Ls_Bn, Ls_Kr, Ls_Gn, Ls_Kh - sample designations

Supplementary Table S3. Morphological characterization of *P. obovata*, *P. abies* and *L. sibirica*.

Trait / tree	<i>Picea obovata</i> Ledeb. – siberian spruce	<i>Picea abies</i> (L.) Karst. – european spruce	<i>Larix sibirica</i> Ledeb – siberian larch
Tree height, crown type	Up to 30 meters, crown narrow-conic	30 to 50 meters, crown sharp conic	Up to 45 meters, crown conic (young trees) to broad and irregular (old trees)
Bark	Gray, rimose	Reddish-brown to gray	Gray, thick, rimose
Needles	Linear awl-shaped tetraquetrous needles	Linear awl-shaped tetraquetrous needles	Narrow, linear, soft needles
Young cones	Purple-red, single, elongated ovoid, 13-20 mm long, 6-7 mm wide	Elongated cylindric, bright red to green	Pink to red, 8-12 mm long
Mature cones	Brown, elongated ovoid, 5-8 cm long.	Brown, elongated cylindric, 10-16 cm long, 3-4 cm wide	Brown to gray-black, 2-3 cm long
Seeds	Dark brown, obovoid, 4 mm long, 2.5 mm wide, wing 10-13 mm long	Dark brown, ovoid, sharp-pointed, 4 mm long, wing yellow-red, 12 mm long	Dark brown, ovoid, 2 mm long, wing yellow-brown

Supplementary Table S4. Characterization of DNA fragments of 6 populations of *P. obovata*.

ISSR primer ID	Fragments (bp)	Number and frequency of polymorphic DNA fragments in populations						Total	
		<i>Po_Kr</i>	<i>Po_Ch</i>	<i>Po_Gn</i>	<i>Po_Br</i>	<i>Po_Kg</i>	<i>Po_Os</i>	N	P
M1 (AC)8CG	200-1690	20 (0,833)	16 (0,800)	16 (0,889)	17 (0,895)	16 (0,889)	18 (0,783)	30	24 (0,800)
CR-212 (CT)8TG	230-1300	14 (0,933)	23 (0,885)	13 (0,765)	21 (0,913)	10 (0,769)	4 (0,571)	29	25 (0,862)
CR-215 (CA)6GT	160-1430	9 (0,750)	12 (0,706)	15 (0,681)	13 (0,650)	14 (0,700)	17 (0,810)	25	19 (0,760)
X10 (AGC)6C	250-1300	5 (0,556)	7 (0,700)	5 (0,714)	5 (0,500)	1 (0,200)	1 (0,250)	15	9 (0,600)
X9 (ACC)6G	370-3000	6 (0,500)	7 (0,538)	9 (0,750)	4 (0,364)	7 (0,700)	4 (0,571)	16	12 (0,750)
Total (frequency)		54 (0,750)	65 (0,756)	58 (0,763)	60 (0,723)	48 (0,727)	44 (0,710)	115	89 (0,774)

Designation of *P. obovata* populations: *Po_Gn*, Gainy's forestry; *Po_Kr*, Krasnovishersk's forestry; *Po_Ch* – Cherdyn's forestry; *Po_Br* – Berezniki's forestry, *Po_Kg* – Sivin's forestry, *Po_Os* – Kungur's forestry; N is the total number of DNA fragments, and P is the number of polymorphic DNA fragments; frequencies are indicated in brackets.

Supplementary Table S5. Characterization of DNA fragments of 6 populations of *L. sibirica*.

ISSR primer ID	Fragments (bp)	Number and frequency of polymorphic DNA fragments in populations						Total	
		<i>Ls_Ih</i>	<i>Ls_Tl</i>	<i>Ls_Bn</i>	<i>Ls_Kr</i>	<i>Ls_Gn</i>	<i>Ls_Kh</i>	N	P
M3 (AC)8CT	220 - 900	18 (0,783)	15 (0,789)	15 (0,833)	14 (0,737)	14 (0,737)	17 (0,809)	24	21 (0,875)
X11 (AGC)6G	220 - 1370	21 (0,913)	29 (0,967)	31 (0,969)	27 (0,900)	31 (0,969)	20 (0,869)	34	31 (0,912)
CR-215 (CA)6GT	200 - 1000	12 (0,705)	5 (0,454)	7 (0,636)	6 (0,500)	13 (0,722)	11 (0,733)	18	15 (0,833)
X10 (AGC)6C	230 - 1200	13 (0,765)	16 (0,762)	19 (0,950)	17 (0,850)	11 (0,733)	11 (0,647)	23	21 (0,913)
ISSR8 (GAG)6C	210 - 600	8 (0,727)	9 (0,750)	7 (0,700)	8 (0,667)	10 (0,769)	7 (0,636)	15	13 (0,867)
Total (frequency)		72 (0,791)	74 (0,796)	79 (0,868)	72 (0,774)	79 (0,814)	66 (0,759)	114	101 (0,886)

Designation of *L. sibirica* populations in the Perm Krai: *Ls_Tl* and *Ls_Ih*— Vishersky Reserve, *Ls_Bn*— Cherdyn's forestry, *Ls_Kr*— Krasnovishersk's forestry, *Ls_Gn*— Gainy's forestry; in the Sverdlovsk Region *Ls_Kh* - Karpinsk's forestry; N is the total number of DNA fragments, and P is the number of polymorphic DNA fragments; frequencies are indicated in brackets.

Supplementary Table S6. Calculation of the genetic originality coefficient (GOC) on the example of 6 populations of *P. obovata* based on the polymorphism of ISSR markers.

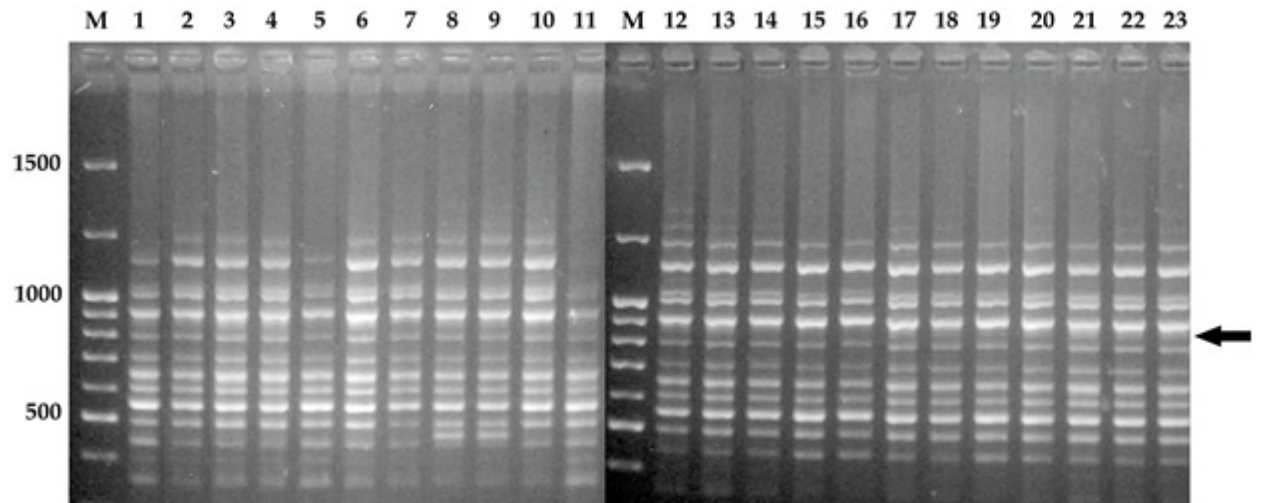
Initial matrix of presence/absence of ISSR fragments in 6 populations							“Weighted” values of the presence/absence of ISSR fragments based on the frequency of occurrence in the sample							Σ	GOC= Σ/N
Pop.	X10_ 1300	X10_ 1200	X10_ 1100	X10_ 1000	X10_ _900	X10_ 800	Pop.	X10_ 1300	X10_ 1200	X10_ 1100	X10_ _00	X10_ _90 0	X10_ 800		
<i>Po_Gn</i>	1	0	1	0	0	1	<i>Po_Gn</i>	1	0.2	0.2	0.2	1	0.5	57,1	0,5540
<i>Po_Ch</i>	1	0	0	0	1	1	<i>Po_Ch</i>	1	0.2	5	0.2	1	0.5	69,7	0,6763
<i>Po_Kr</i>	0	0	1	1	1	0	<i>Po_Kr</i>	1	0.2	0.2	5	1	2	91,3	0,8860
<i>Po_Br</i>	1	1	1	0	1	0	<i>Po_Br</i>	1	5	0.2	0.2	1	2	81,1	0,7870
<i>Po_Kg</i>	0	0	1	0	0	1	<i>Po_Kg</i>	1	0.2	0.2	0.2	1	0.5	88,3	0,8569
<i>Po_Os</i>	0	0	1	0	0	1	<i>Po_Os</i>	1	0.2	0.2	0.2	1	0.5	105,7	1,0258
Quantity "1"	3	1	5	1	3	4	Quantity "1"	3	1	5	1	3	4		
Quantity "0"	3	5	1	5	3	2	Quantity "0"	3	5	1	5	3	2		
"Weight" "1"	1	5	0.2	5	1	0.5	"Weight" "1"	1	5	0.2	5	1	0.5		
"Weight" "0"	1	0.2	5	0.2	1	2	"Weight" "0"	1	0.2	5	0.2	1	2		

Note: Σ is the sum of the "weights" of all ISSR fragments for each population, $GOC=\Sigma/N$ is the coefficient of genetic originality of the population as a quotient of the obtained sum and the number of analyzed ISSR fragments of each population (n=103).

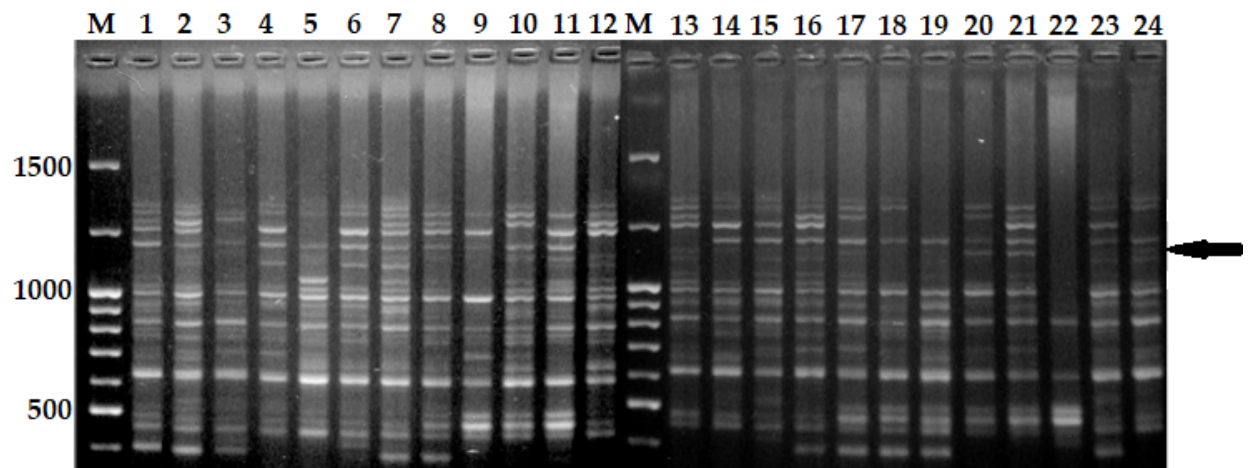
Supplementary Table S7. Calculation of the genetic originality coefficient (GOC) on the example of 6 populations of *L. sibirica* based on the polymorphism of ISSR markers.

Initial matrix of presence/absence of ISSR fragments in 6 populations							“Weighted” values of the presence/absence of ISSR fragments based on the frequency of occurrence in the sample							Σ	GOC= Σ/N
Pop.	M3_9 00	M3_8 50	M3_ 820	M3_6 60	M3_ 650	M3_6 20	Pop.	M3_9 00	M3_8 50	M3_ 820	M3_66 0	M3_65 0	M3_6 20		
<i>Ls_Tl</i>	1	1	1	1	1	1	<i>Ls_Tl</i>	0.2	1	1	1	0.2	1	60,4	0,5749
<i>Ls_Ih</i>	1	1	1	1	1	1	<i>Ls_Ih</i>	0.2	1	1	1	0.2	1	58,6	0,5577
<i>Ls_Kr</i>	1	0	0	0	0	0	<i>Ls_Kr</i>	0.2	1	1	1	5	1	45,4	0,4320
<i>Ls_Bn</i>	1	0	0	0	1	0	<i>Ls_Bn</i>	0.2	1	1	1	0.2	1	39,1	0,3720
<i>Ls_Gn</i>	1	0	0	0	1	0	<i>Ls_Gn</i>	0.2	1	1	1	0.2	1	69,4	0,6606
<i>Ls_Kh</i>	0	1	1	1	1	1	<i>Ls_Kh</i>	5	1	1	1	0.2	1	82,3	0,7834
Quantity "1"	5	3	3	3	5	3	Quantity "1"	5	3	3	3	5	3		
Quantity "0"	1	3	3	3	1	3	Quantity "0"	1	3	3	3	1	3		
"Weight" "1"	0.2	1	1	1	0.2	1	"Weight" "1"	0.2	1	1	1	0.2	1		
"Weight" "0"	5	1	1	1	5	1	"Weight" "0"	5	1	1	1	5	1		

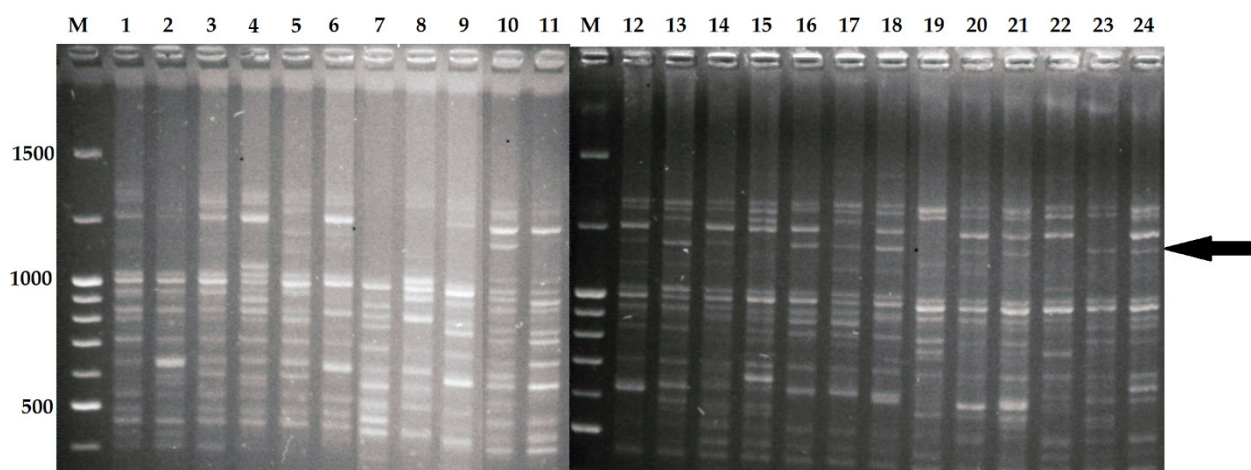
Note: Σ is the sum of the "weights" of all ISSR fragments for each population, $GOC=\Sigma/N$ is the coefficient of genetic originality of the population as a quotient of the obtained sum and the number of analyzed ISSR fragments of each population (n=105).



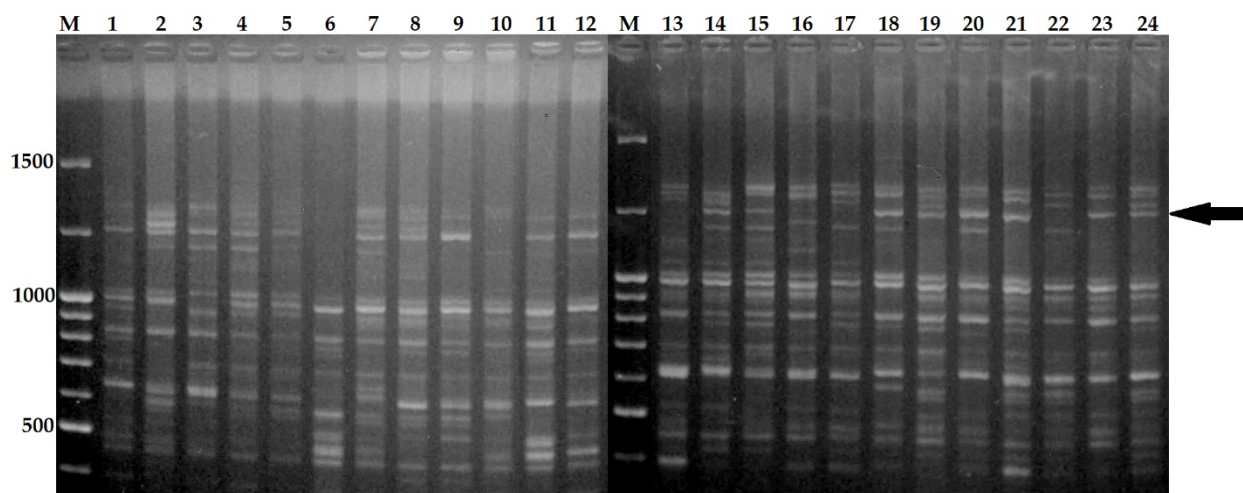
Supplementary Figure S1. The band profiles with ISSR primer X9 (ACC)₆G for the samples of *P.obovata* from the populations of Gainy's forestry (*Po_Gn*). The numbers on the top indicate the sample numbers (1-23). Size marker (M): 100 bp DNA Ladder, marked on the left in bp (300 bp to 1500 bp).



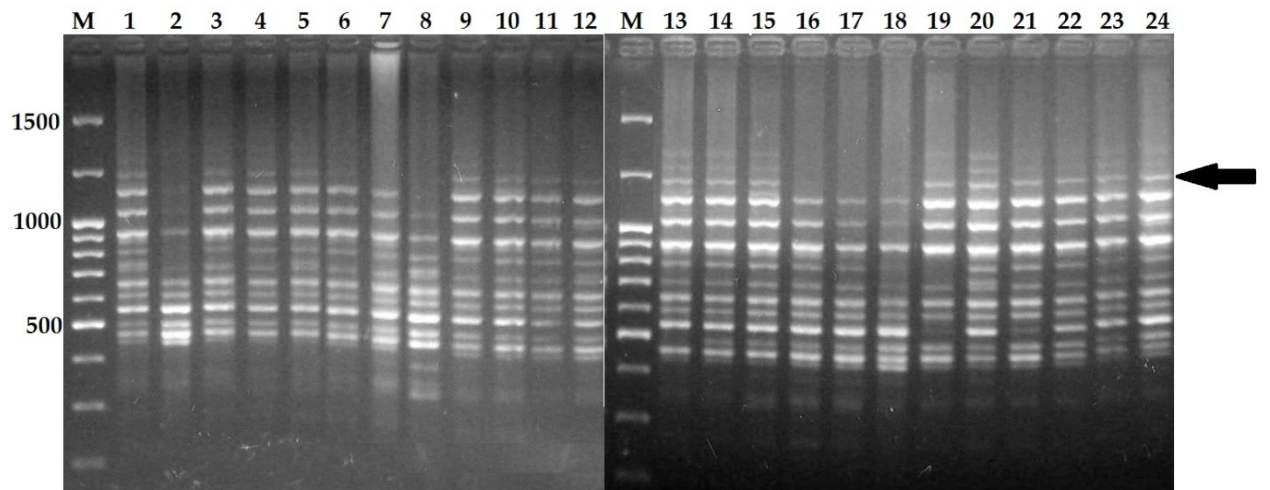
Supplementary Figure S2. The band profiles with ISSR primer M1 (AC)₈CG for the samples of *P.obovata* from the populations of Krasnovishersk's forestry (*Po_Kr*). The numbers on the top indicate the sample numbers (1-24). Size marker (M): 100 bp DNA Ladder, marked on the left in bp (400 bp to 1500 bp).



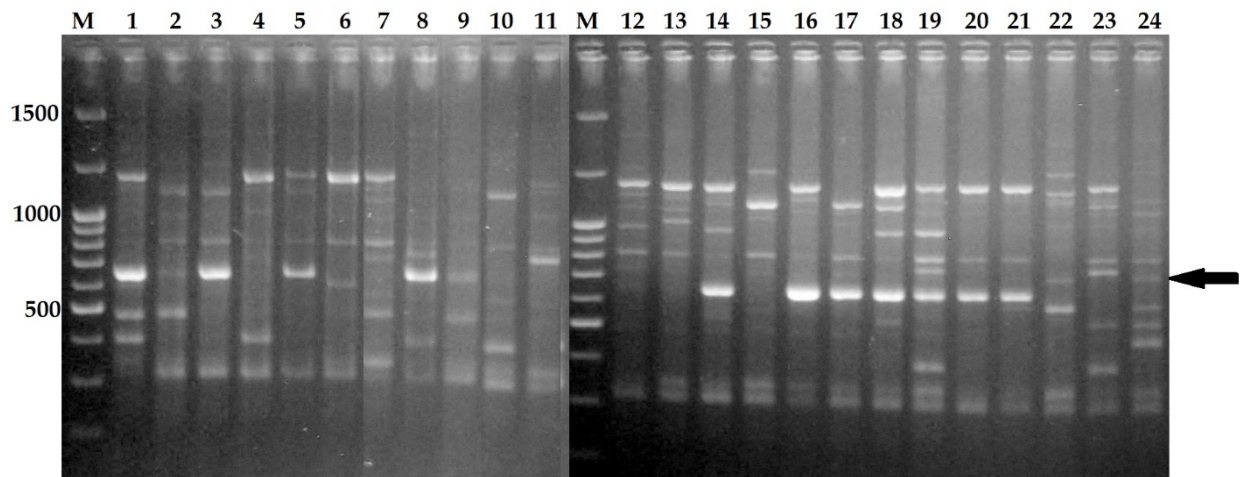
Supplementary Figure S3. The band profiles with ISSR primer M1 (AC)₈CG for the samples of *P.obovata* from the populations of Gainy's forestry (*Po_Gn*). The numbers on the top indicate the sample numbers (1-24). Size marker (M): 100 bp DNA Ladder, marked on the left in bp (400 bp to 1500 bp).



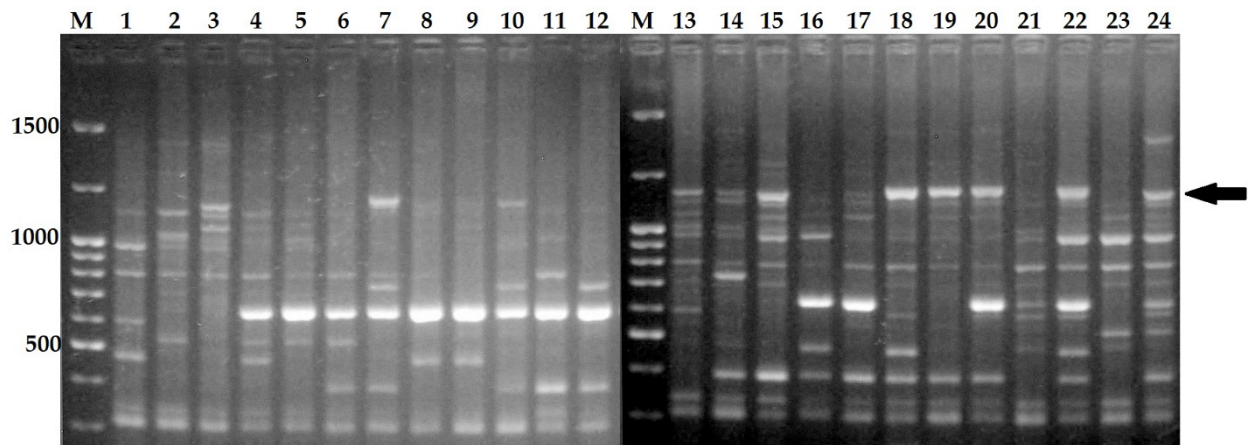
Supplementary Figure S4. The band profiles with ISSR primer M1 (AC)₈CG for the samples of *P.obovata* from the populations of Cherdyn's forestry (*Po_Ch*). The numbers on the top indicate the sample numbers (1-24). Size marker (M): 100 bp DNA Ladder, marked on the left in bp (400 bp to 1500 bp).



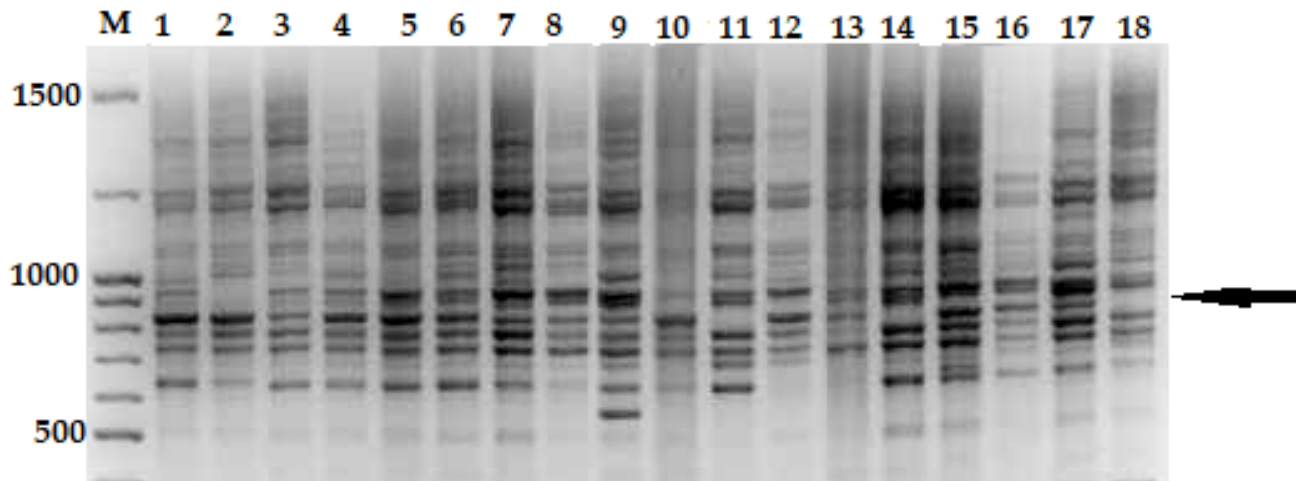
Supplementary Figure S5. The band profiles with ISSR primer X9 (ACC)6G for the samples of *P.obovata* from the populations of Cherdyn's forestry (*Po_Ch*). The numbers on the top indicate the sample numbers (1-24). Size marker (M): 100 bp DNA Ladder, marked on the left in bp (300 bp to 1500 bp).



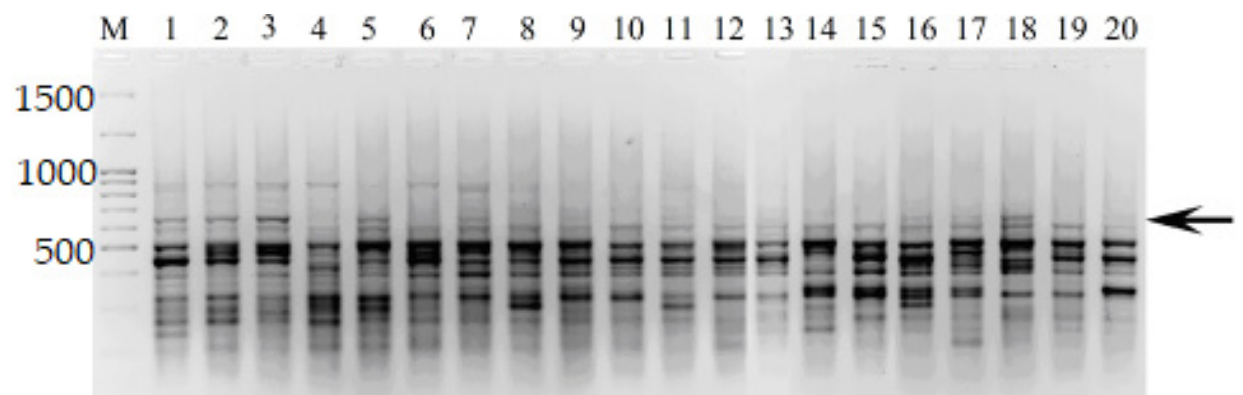
Supplementary Figure S6. The band profiles with ISSR primer X9 (ACC)6G for the samples of *P.obovata* from the populations of Krasnovishersk's forestry (*Po_Kr*). The numbers on the top indicate the sample numbers (1-24). Size marker (M): 100 bp DNA Ladder, marked on the left in bp (300 bp to 1500 bp).



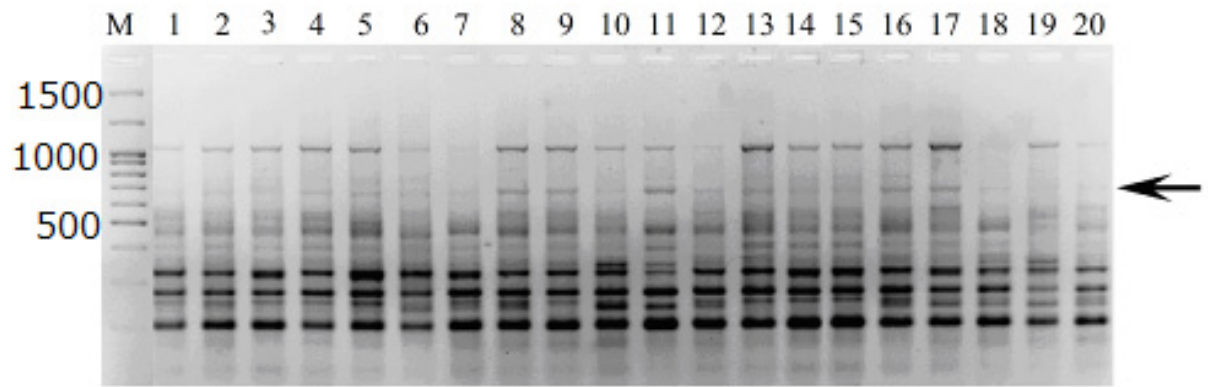
Supplementary Figure S7. The band profiles with ISSR primer X9 (ACC)6G for the samples of *P.obovata* from the populations of Karagai's forestry (*Po_Kg*). The numbers on the top indicate the sample numbers (1-24). Size marker (M): 100 bp DNA Ladder, marked on the left in bp (300 bp to 1500 bp).



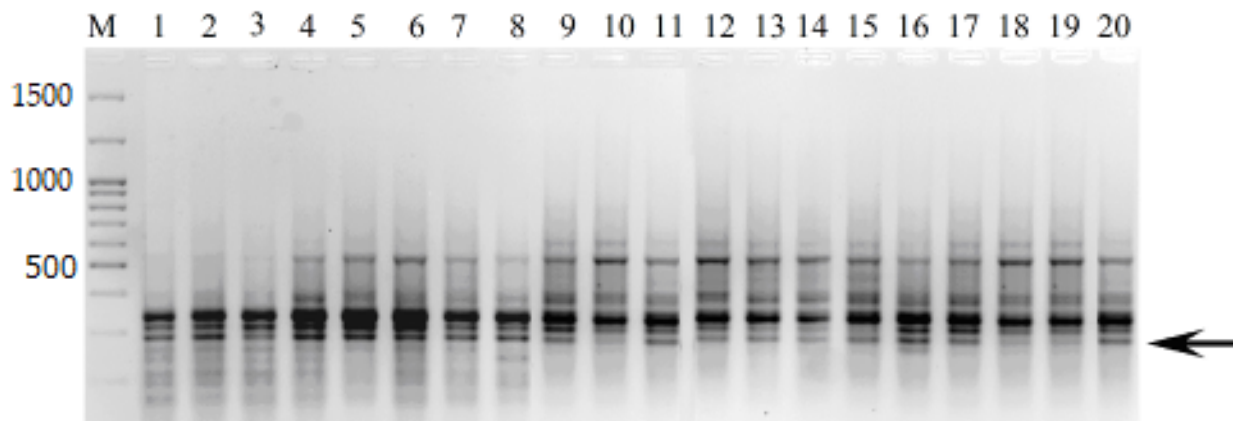
Supplementary Figure S8. The band profiles with ISSR primer X9 (ACC)6G for the samples of *P.obovata* from the populations of Berezniki's forestry (*Po_Br*). The numbers on the top indicate the sample numbers (1-18). Size marker (M): 100 bp DNA Ladder, marked on the left in bp (300 bp to 1500 bp).



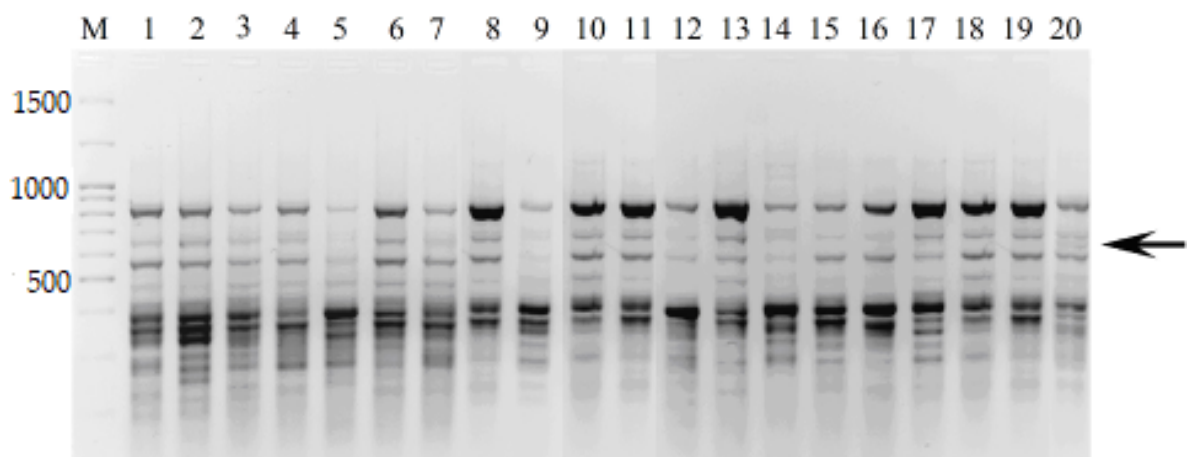
Supplementary Figure S9. The band profiles with ISSR primer M3 (AC)8CT for the samples of *L. sibirica* from the populations of Gainy's forestry (*Ls_Gn*). The numbers on the top indicate the sample numbers (1-20). Size marker (M): 100 bp DNA Ladder, marked on the left in bp (300 bp to 1500 bp).



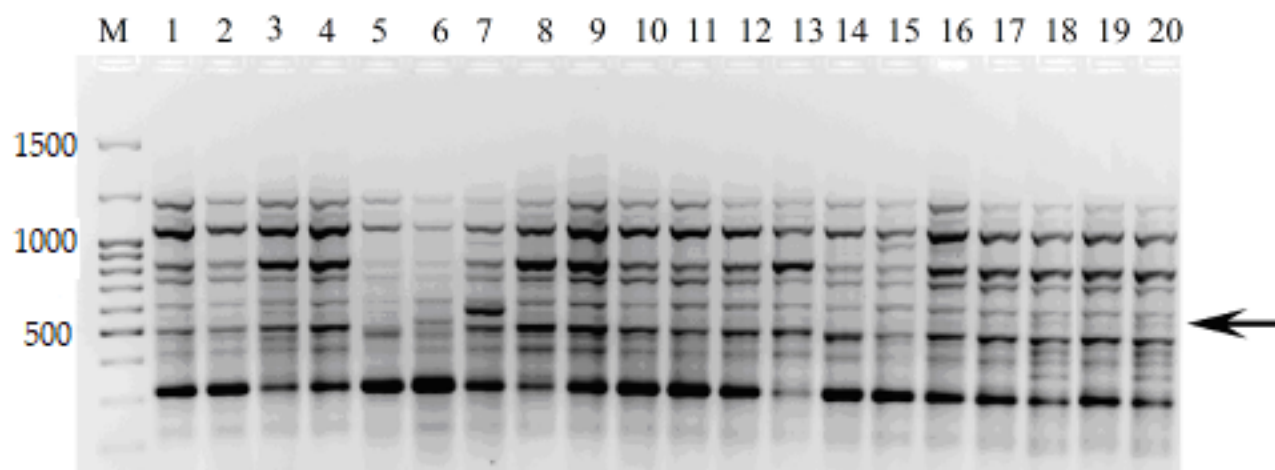
Supplementary Figure S10. The band profiles with ISSR primer CR-215 (CA)₆GT for the samples of *L. sibirica* from the populations of Cherdyn's forestry (*Ls_Bn*). The numbers on the top indicate the sample numbers (1-20). Size marker (M): 100 bp DNA Ladder, marked on the left in bp (300 bp to 1500 bp).



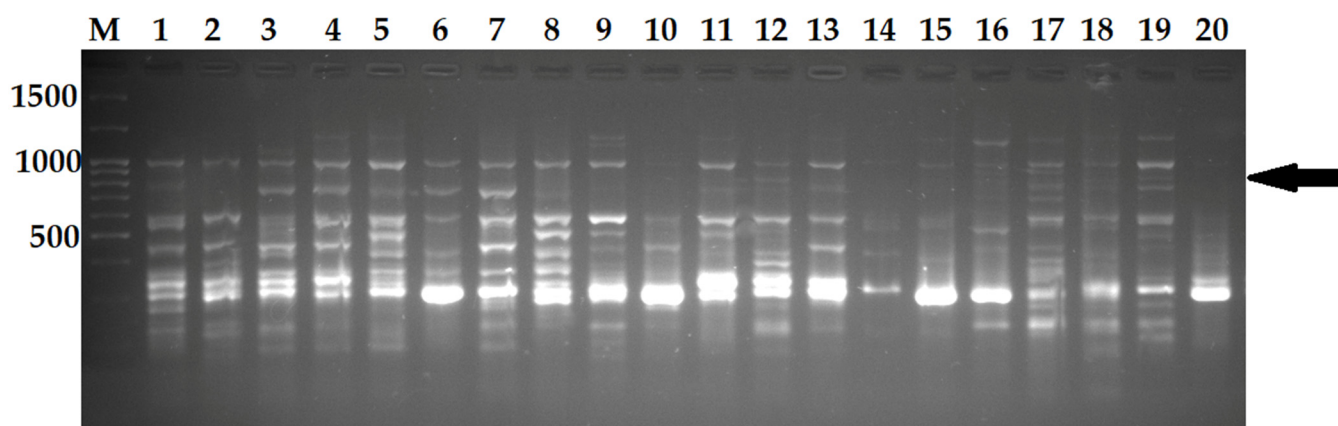
Supplementary Figure S11. The band profiles with ISSR primer ISSR8 (GAG)₆C for the samples of *L. sibirica* from the populations of Krasnovishersk's forestry (*Ls_Kr*). The numbers on the top indicate the sample numbers (1-20). Size marker (M): 100 bp DNA Ladder, marked on the left in bp (300 bp to 1500 bp).



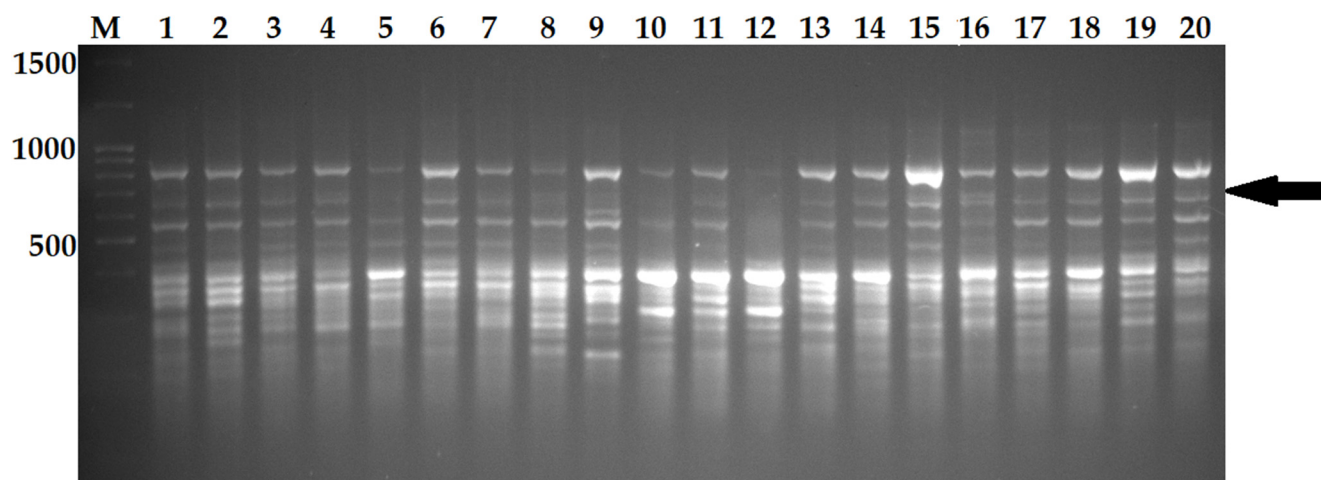
Supplementary Figure S12. The band profiles with ISSR primer X10 (AGC)₆C for the samples of *L. sibirica* from the populations of Vishera Nature Reserve (*Ls_Ih*). The numbers on the top indicate the sample numbers (1-20). Size marker (M): 100 bp DNA Ladder, marked on the left in bp (300 bp to 1500 bp).



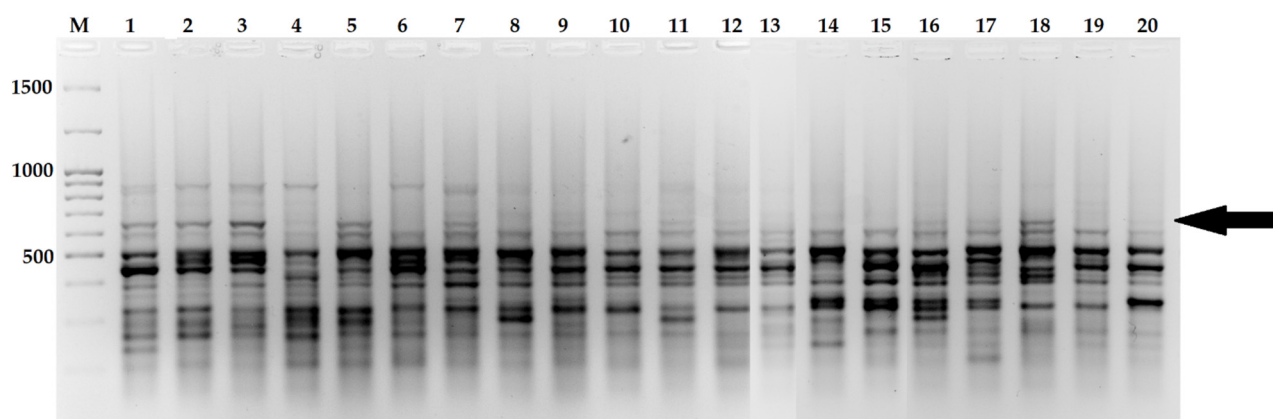
Supplementary Figure S13. The band profiles with ISSR primer X11 (AGC)6G for the samples of *L. sibirica* from the populations of Vishera Nature Reserve (*Ls_Tl*). The numbers on the top indicate the sample numbers (1-20). Size marker (M): 100 bp DNA Ladder, marked on the left in bp (300 bp to 1500 bp).



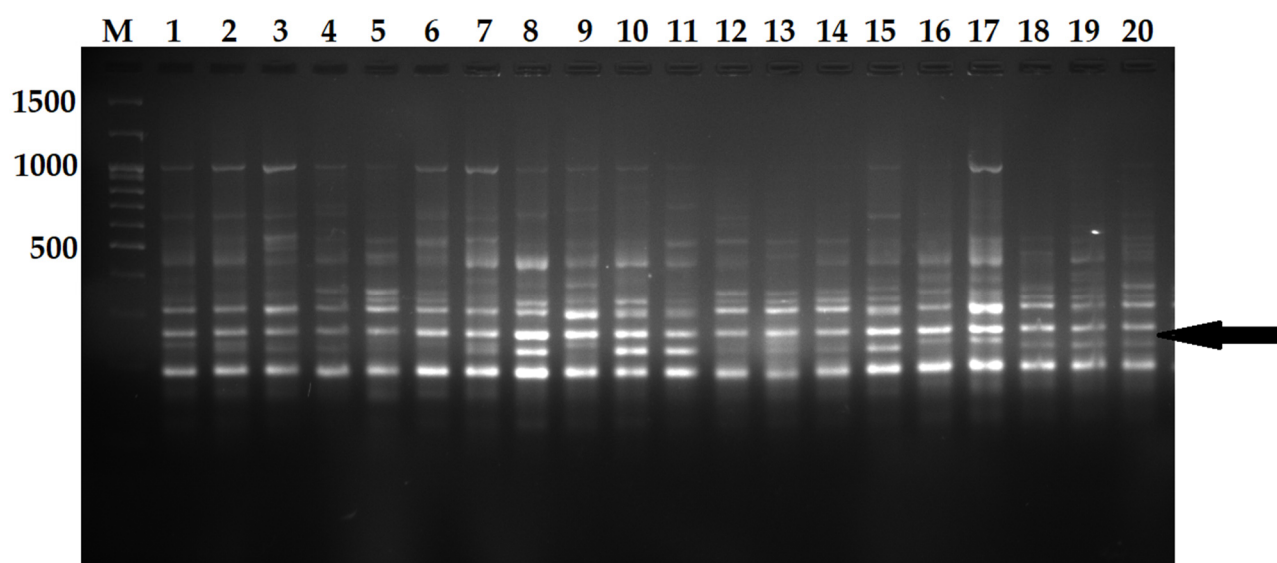
Supplementary Figure S14. The band profiles with ISSR primer X11 (AGC)6G for the samples of *L. sibirica* from the populations of Vishera Nature Reserve (*Ls_Ih*). The numbers on the top indicate the sample numbers (1-20). Size marker (M): 100 bp DNA Ladder, marked on the left in bp (300 bp to 1500 bp).



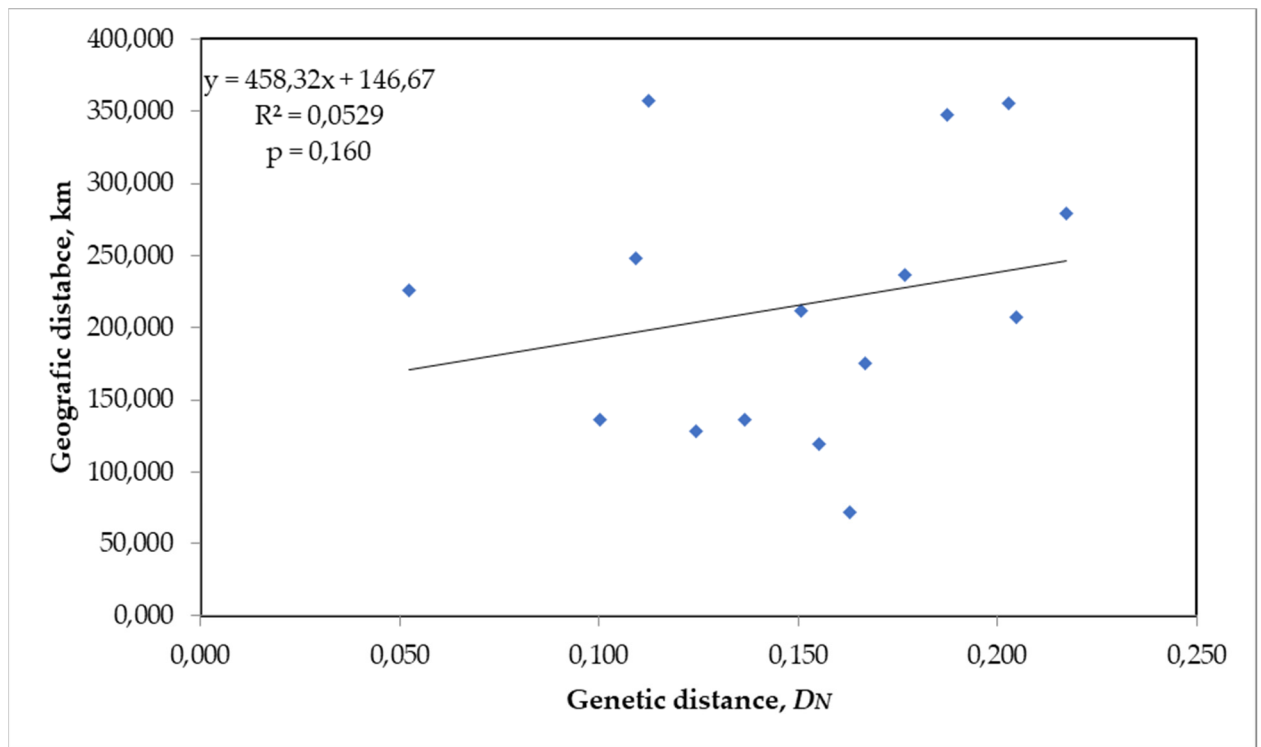
Supplementary Figure S15. The band profiles with ISSR primer X10 (AGC)6C for the samples of *L. sibirica* from the populations of Karpinsk's forestry (*Ls_Kh*). The numbers on the top indicate the sample numbers (1-20). Size marker (M): 100 bp DNA Ladder, marked on the left in bp (300 bp to 1500 bp).



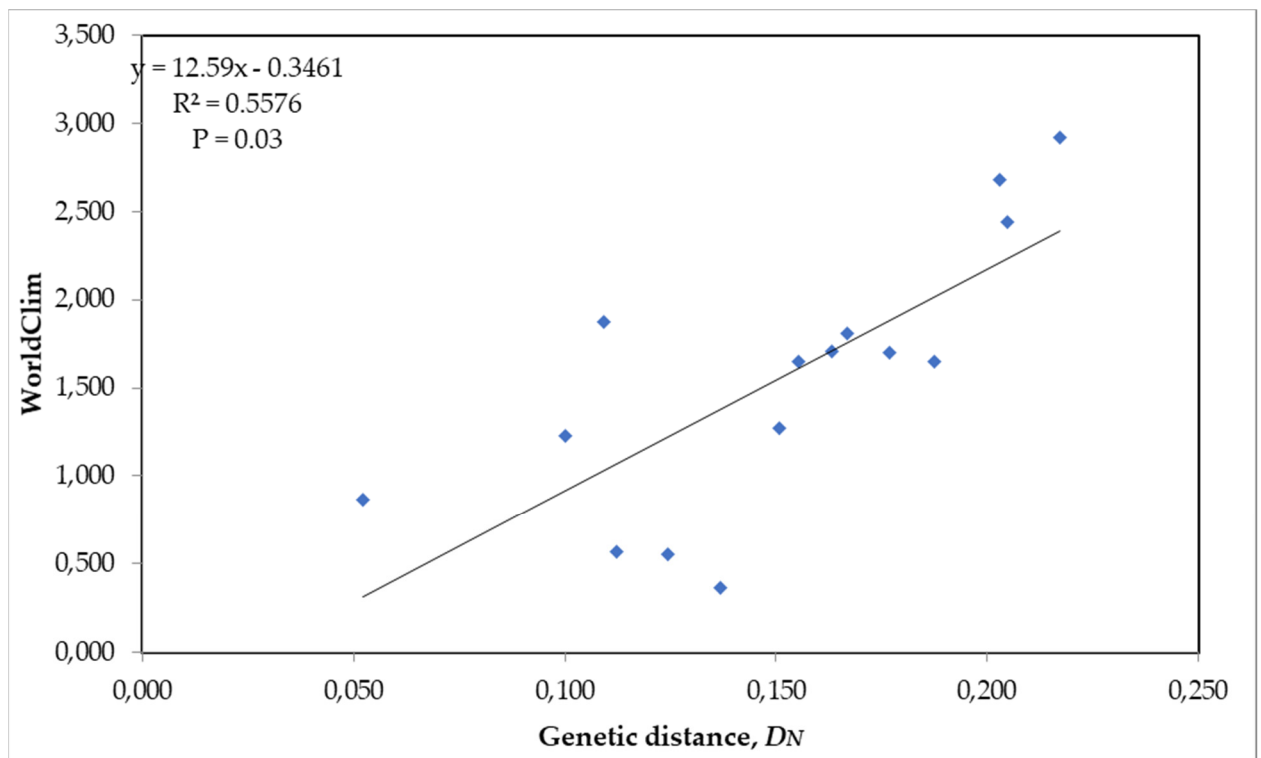
Supplementary Figure S16. The band profiles with ISSR primer M3 (AC)₈CT for the samples of *L. sibirica* from the populations of Krasnovishersk's forestry (*Ls_Kr*). The numbers on the top indicate the sample numbers (1-20). Size marker (M): 100 bp DNA Ladder, marked on the left in bp (300 bp to 1500 bp).



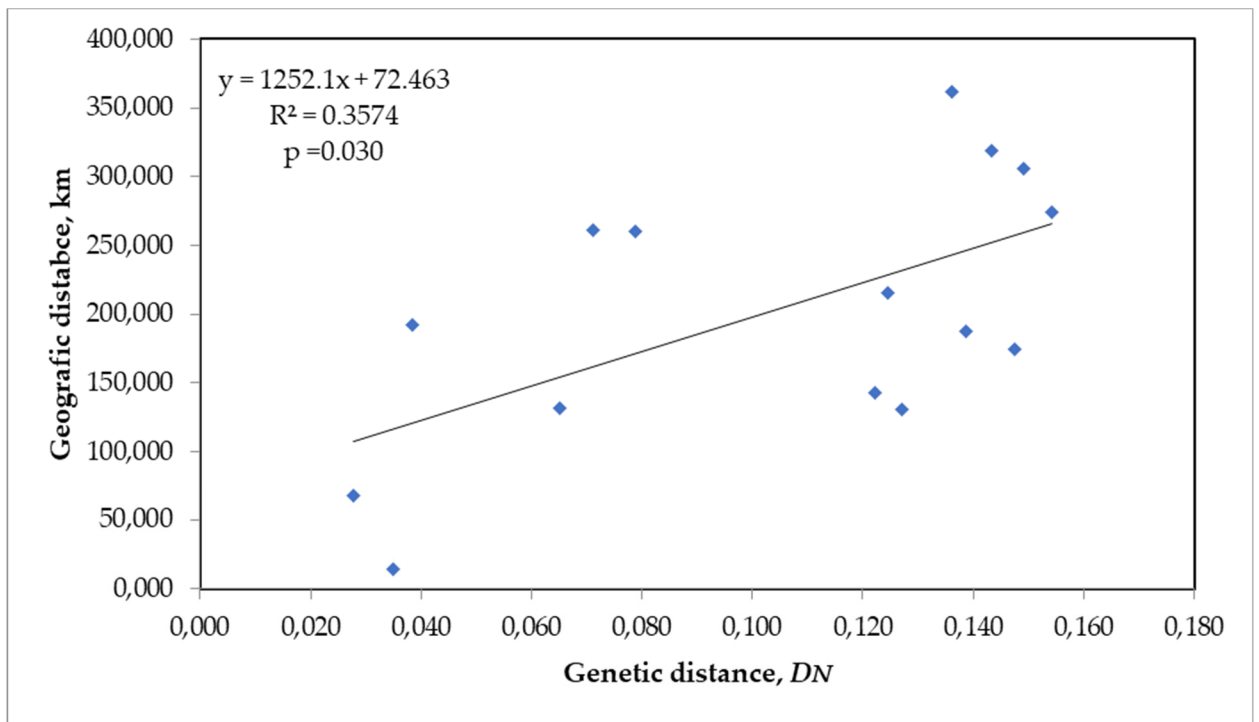
Supplementary Figure S17. The band profiles with ISSR primer CR-215 (CA)₆GT for the samples of *L. sibirica* from the populations of Gainy's forestry (*Ls_Gn*). The numbers on the top indicate the sample numbers (1-20). Size marker (M): 100 bp DNA Ladder, marked on the left in bp (300 bp to 1500 bp).



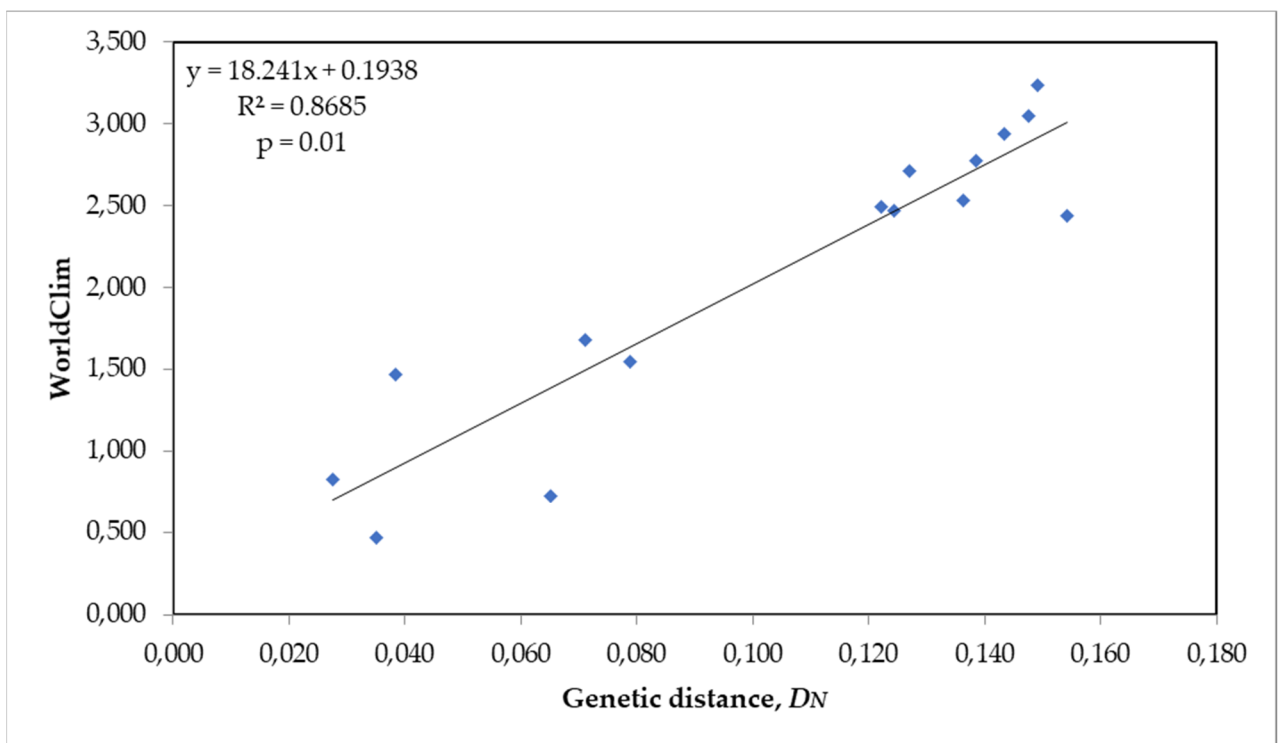
Supplementary Figure S18. Graph of dependence of genetic (D_N) and geographical distances of *P. obovata* samples.



Supplementary Figure S19. Mantel test for the WorldClim data and genetic (D_N) distance of *P. obovata* samples.



Supplementary Figure S20. Graph of dependence of genetic (D_N) and geographical distances of *L. sibirica* samples.



Supplementary Figure S21. Mantel test for the WorldClim data and genetic (D_N) distance of *L. sibirica* samples.