forests

Supplementary material

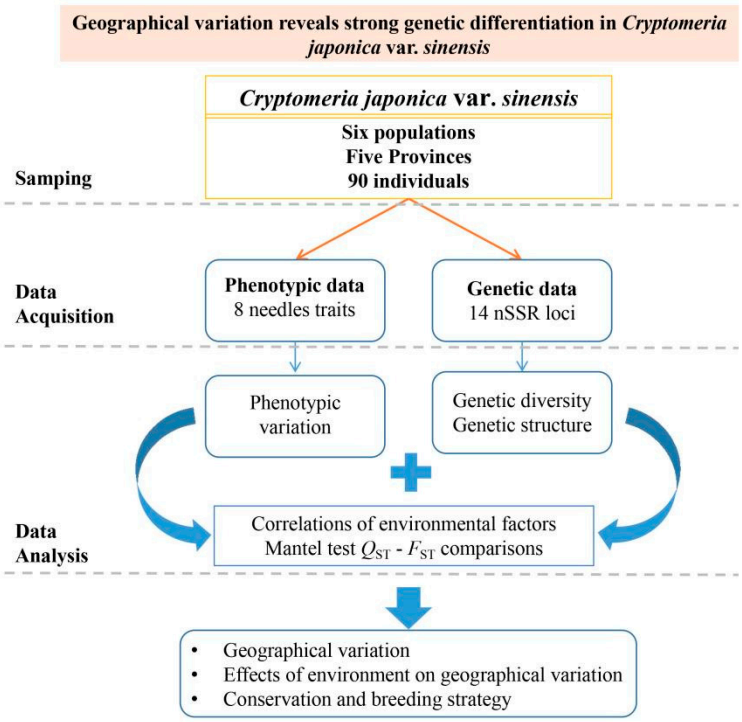

Figure S1. The schematic diagram of this study.

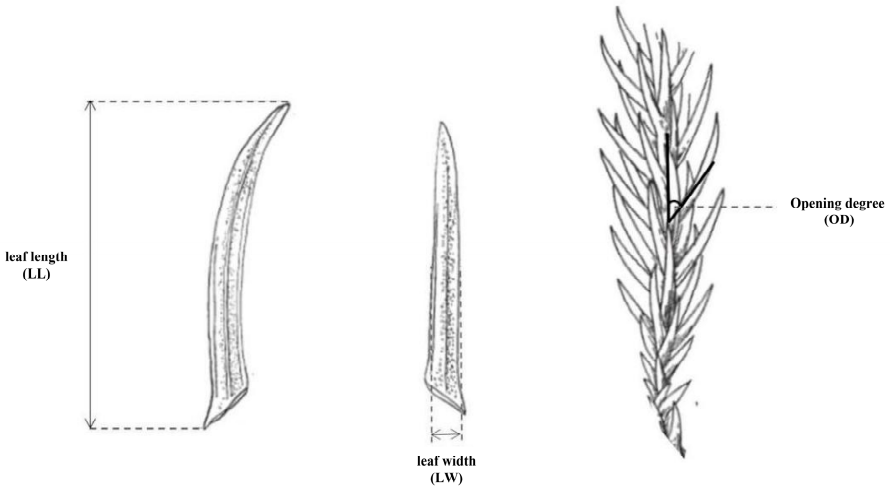

Figure S2: Measured needle morphological traits: the length measured from the base of the needle up to the tip (leaf length, LL); the maximum width of the needles (leaf width, LW); and the opening degree of needles (opening degree, OD)

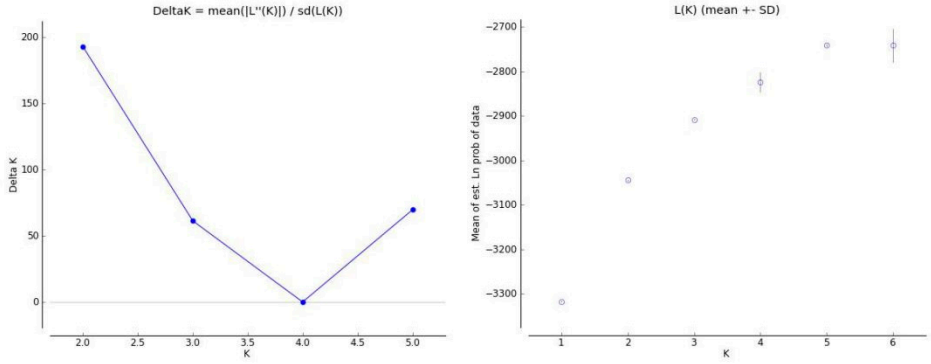

Figure S3: STRUCTURE analysis results of the *C. japonica* var. *sinensis* populations calculated by Evanno et al., 2005.

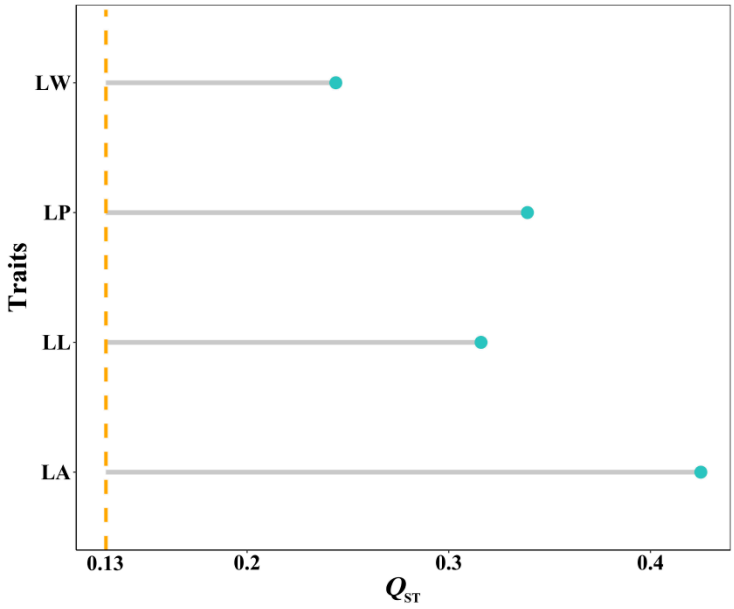

Figure S4. Q_{ST}–F_{ST} comparison

Table S1. The information of nSSR loci used in this study.

No.	Locus	Primer sequence (5'-3')	Motif	Fluorescent dye	Soure
1	CS1895M	F：TGAGAGAGGGAGGGAGGGTT R：GAGTCCTTGTCCCGTTTTGT	$(TG)_{10}$	FAM	Tani N.et al (2003)
2	BY900902	F：ATGGAAGGAAAGTGAGGTGGGAAT R：GTTTCGCGGAGAGGATTAGATGAAGAC	$(GGT)_3$gttgct gtcatttctgcttc gtcgcaa	HEX	Moriguchi, Y.et al (2009)
3	Cjgssr31	F：TCTCTCAATATCCCCTTATTCT R：GGGGATATAGGGATGTATGG	$(CT)_{23}$	TAMBA	Moriguchi, Y.et al (2003)
4	BY894091	F：ATTTTGTCCGCTGCTATTACCGAT R：GTTTCCATGAGGTGAGCTTGCTGTTAGA	$(CT)_4$catc $(TA)_4$	FAM	Moriguchi, Y.et al (2009)

5	CS1737M	F：TACCCTCAACCCTTCACCCT R：TTACCCACCTCTCTTTCCTC	$(AG)_{40}$	TAMBA	Tani N.et al (2003)
6	Cjgssr175	F：ACCCTTTGAATTATTCCTTGAG R：AGCGGAAAAAACTACATCAGA	$(CT)_{16}$	FAM	Moriguchi, Y.et al (2005)
7	Cjgssr7	F：ATCAAATGTGAAGCAAACAGT R：AGAGGGAAGAGGAAGATAAAGA	$(TC)_{15}A(TC)_6$	HEX	Moriguchi, Y.et al (2003)
8	BY896143	F：AGCTGGGTCAATTAAATCCTTCTG R：GTTTCCCCCAAAGATCCTCAGGTAACAT	$(TA)_8$	TAMBA	Moriguchi, Y.et al (2009)
9	BY898881	F：ATTTTCGAAGGACAAGACCCTGTG R：GTTTCCACAAAAATGACCACTGTTCC	$(TC)_3c(TA)4t$ gatatacag$(CA)_3$	HEX	Moriguchi, Y.et al (2009)
10	Cjgssr120	F：GGGACTTCCCTCCTTTTG R：AGGACGAACATCATGTAGAAGA	$(CT)21CC(CT)_6$	HEX	Moriguchi, Y.et al (2003)
11	Cjgssr181	F：AGAGGGAGGGAGGAATACAT R：GGCTGAGAGTTTAGGGTTTACA	$(AG)_3G(GA)_{23}$	TAMBA	Moriguchi, Y.et al (2003)
12	BJ939490	F：ACTTGTTTATTTTGGCAGGCGAGT R：GTTTACAGCCTTAACACATCAGACGCAG	$(TC)_9$	FAM	Moriguchi, Y.et al (2009)
13	CS1522M	F：AAAGTTTGATTAGGGCAGGG R：AAACGTGGGTGCTATCCTTC	$(AC)_{16}$	HEX	Tani N.et al (2003)
14	BY909057	F：ATACCCTATGGCGTCTGTGCTGTA R：GTTTCTCGTCAGAGGCACAGTACGAA	$(CGC)_{10}$	TAMBA	Moriguchi, Y.et al (2009)

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Table S2. The bioclimatic variables (Bio1-Bio19) of six geographical populations in this study.

Bioclimatic Variables	Description	FJ01	FJ02	ZJ	HN	SC	YN
Bio1	Annual Mean Temperature /℃	18.4	15.7	12.3	15.4	15.1	13.8
Bio2	Mean Diurnal Range (Mean of monthly (max temp - min temp)) /℃	7.1	7.8	7.3	7.5	7.2	10.5
Bio3	Isothermality (Bio2/Bio7) (×100) /%	27.0	30.1	24.5	24.8	27.7	47.3
Bio4	Temperature Seasonality (standard deviation ×100)	706.9	650.6	827.6	828.8	682.0	457.6
Bio5	Max Temperature of Warmest Month /℃	31.5	28.5	27.0	30.4	27.6	23.2
Bio6	Min Temperature of Coldest Month /℃	5.3	2.5	-3.0	0.2	1.7	0.9
Bio7	Temperature Annual Range (Bio5-Bio6) /℃	26.2	26.0	30.0	30.2	25.9	22.3
Bio8	Mean Temperature of Wettest Quarter /℃	20.8	18.8	20.1	19.6	22.5	18.7

Bio9	Mean Temperature of Driest Quarter /℃	11.9	8.9	3.9	6.9	6.2	7.7
Bio10	Mean Temperature of Warmest Quarter /℃	26.8	23.4	22.3	25.3	23.1	18.7
Bio11	Mean Temperature of Coldest Quarter /℃	9.7	7.3	1.9	4.9	6.2	7.7
Bio12	Annual Precipitation /mm	1591.0	1830.0	1531.0	1566.0	1392.0	975.0
Bio13	Precipitation of Wettest Month /mm	261.0	316.0	241.0	247.0	333.0	185.0
Bio14	Precipitation of Driest Month /mm	43.0	45.0	40.0	45.0	17.0	12.0
Bio15	Precipitation Seasonality (Coefficient of Variation)	55.1	58.5	49.2	51.5	92.4	84.3
Bio16	Precipitation of Wettest Quarter /mm	617.0	828.0	603.0	692.0	806.0	536.0
Bio17	Precipitation of Driest Quarter /mm	140.0	166.0	155.0	179.0	58.0	40.0
Bio18	Precipitation of Warmest Quarter /mm	534.0	649.0	596.0	505.0	800.0	536.0
Bio19	Precipitation of Coldest Quarter /mm	182.0	208.0	174.0	198.0	58.0	40.0

Table S3. Principal component eigenvectors, eigenvalues, and contribution values.

Phenotypic traits	**PC1**	**PC2**	**Contribution**
LA	1.969164185	0.696884064	5.461
LW	1.372872223	1.605637542	28.989
LL	1.971081988	-0.660203264	4.901
RF	0.500331668	-2.063146078	47.863
LP	2.125314715	0.045916624	0.024
SI	-1.613683394	1.016851205	11.627
SH	-1.236675298	-0.139425891	0.219
OD	0.447393656	0.285703269	0.918