

Supplementary Material

Genetic diversity of ancient *Camellia sinensis* (L.)O.Kuntze in Sandu County of Guizhou Provinc in China

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Table S1 Standardized treatment and assignment of phenotypic characters of the tea plant leaves used for diversity analysis

Number	Phenotypic character	Data assignment
1	Tree form	Arbor (1); Semiarbors (2); Bush (3)
2	Leaf shape	Suborbicular (1); Oval (2); Long oval (3); lanceolate (4)
3	Leaf size	lobules (1); middle leaves (2); large leaves (3); oversized leaves (4)
4	Leaf texture	Soft (1); Hard (2)
5	Leaf apex	Acute (1); Taper (2); Obtuse (3)
6	Leaf tooth depth	Shallow (1); Medium (2); Deep (3)
7	Leaf colour	Bottle green (1); Green (2); Yellow green (3)

Leaf area = leaf length * leaf width *0.7. Leaf area greater than 60 cm² is very large, leaf area between 40 and 60 cm² is large, leaf area between 20 and 40 cm² is middle, and leaf area less than 20 cm² is lobular. Leaf shape index = leaf length/leaf width. If the leaf shape index is less than 2.0, it is subcircular; if the leaf shape index is 2.0~2.5, it is elliptic; if the leaf shape index is 2.5~3.0, it is long elliptic; if the leaf shape index is greater than 3.0, it is lanceolate.

Table S2 Statistical analysis of the seven qualitative characters of 145 ancient tea plant germplasm used for diversity analysis of phenotypic characters

Items	Tree form	Leaf texture	Leaf apex	Leaf shape	Leaf size	Leaf tooth depth	Leaf colour
Maximum	3	2	3	4	4	3	3
Minimum	1	1	1	1	1	1	1
Mean	2.37	1.86	1.57	2.63	1.88	1.51	1.72
SD	0.87	0.35	0.69	0.67	0.58	0.76	0.70
CV (%)	36.8 2	18.58	44.18	25.35	30.70	50.64	40.01
H	0.77	0.55	0.81	0.83	0.76	0.78	0.84

SD-Standard deviation; CV- the variation coefficients; H- diversity indices

Table S3 Statistical analysis of the six quantitative characters of 145 ancient tea plant germplasm used for diversity analysis of phenotypic characters

Items	Leaf veins logarithmic	Leaf teeth logarithmic	Height of tree	Leaf area	Length of leaf	Leaf width
Maximum	13.67	41.67	12	70.72	16.53	6.10
Minimum	4.33	6.33	0.70	8.58	5.03	2.43
Mean	8.70	24.91	4.45	27.9	9.89	3.90
SD	1.55	7.23	2.69	9.87	1.93	0.7
CV (%)	17.76	29.02	60.37	35.37	19.53	17.91
H	1.72	2.66	2.17	2.74	2.50	2.26

SD-Standard deviation; CV- the variation coefficients; H- diversity indices

Table S4 Variation coefficients of the phenotypic characters of five populations of ancient tea plant germplasm used for diversity analysis

Characters \ Sites	Zenya village (arbor)(%)	Yangmeng village (arbor)(%)	Landong village (arbor)(%)	Landong Village (bush)(%)	Guqi village (bush)(%)
Tree shape	6.43	22.59	17.06	-	-
Leaf texture	24.53	-	7.62	-	26.39
Leaf apex	30.84	41.70	39.06	50.67	55.36
Leaf shape	25.66	19.57	24.51	25.26	24.27
Leaf size	27.05	23.57	23.94	31.05	19.19
Leaf tooth depth	57.77	48.43	34.54	45.71	40.18
Leaf colour	39.71	55.80	34.81	36.14	40.96
Veins logarithmic	18.98	20.77	11.38	24.68	13.26
Leaves teeth logarithmic	26.61	22.68	23.46	20.20	18.07
Height of tree (m)	41.27	29.81	38.32	43.30	42.37
Length of leaf (cm)	15.87	11.56	14.17	18.68	15.60
Leaf width (cm)	13.81	12.19	15.42	14.63	13.05
Leaf area (cm ²)	27.58	28.37	26.63	33.34	23.76
Mean	27.39	25.93	23.92	26.44	25.57

Table S5 Diversity index(H) of phenotypic characters of five populations of ancient tea plant germplasm used for diversity analysis

Characters \ Sites	Zenya village (arbor)	Yangmeng village (arbor)	Landong village (arbor)	Landong village (bush)	Guqi village (bush)
Tree shape	0.158	0.325	0.607	-	-
Leaf texture	0.552	-	0.109	-	0.586
Leaf apex	0.733	1.089	0.610	0.861	0.677
Leaf shape	0.936	0.802	1.021	0.882	0.846
Leaf size	0.608	0.639	0.765	0.393	0.485
Leaf tooth depth	0.506	1.030	0.536	1.085	1.084
Leaf colour	1.007	0.898	1.002	0.580	0.819
Leaf veins					
logarithmic	2.692	1.887	2.247	2.431	2.221
Leaf teeth					
logarithmic	3.333	2.164	3.394	2.488	2.902
Height of tree (m)	2.870	2.164	3.343	1.876	2.284
Length of leaf (cm)	3.723	2.303	3.552	2.616	2.965
Leaf width (cm)	3.267	2.164	3.319	2.523	2.902
Leaf area (cm ²)	3.989	2.303	3.784	2.708	3.028
Mean	1.870	1.370	1.870	1.420	1.600

Table S6 Eigenvectors and contribution rates of the principal components of 13 phenotypic characters

Principal components	Eigenvalue	Contribution (%)	Cumulative (%)
PC1	4.226	32.505	32.505
PC2	2.066	15.891	48.396
PC3	1.768	13.598	61.994
PC4	1.222	9.401	71.395
PC5	0.988	7.596	78.991
PC6	0.844	6.491	85.482

Table S7 Genetic concordances estimates in the 145 ancient tea plant germplasm by using 15 SSR markers

Samples	Numerical	Maximum and Number	Minimum and Number
Genetic concordance between arbor		0.9529±0.0496 (37-25)	0.5882±0.0295 (102-48)
Genetic concordance between bush		0.9294±0.0212 (126-124)	0.6118±0.0148 (132-113)
Genetic concordance between arbor and bush		0.9176±0.0220 (108-105)	0.5765±0.0038 (127-48)

Table S8 Genetic distance estimates in the 145 ancient tea plant germplasm by using 15 SSR markers

Samples	Numerical	Maximum and Number	Minimum and Number
Genetic concordance between arbor		0.5306±0.0477 (48-102)	0.0482±0.0088 (25-37)
Genetic concordance between bush		0.4914±0.0211 (132-113)	0.0732±0.0257 (126-124)
Genetic concordance between arbor and bush		0.5508±0.0056 (127-48)	0.0859±0.0295 (108-105)

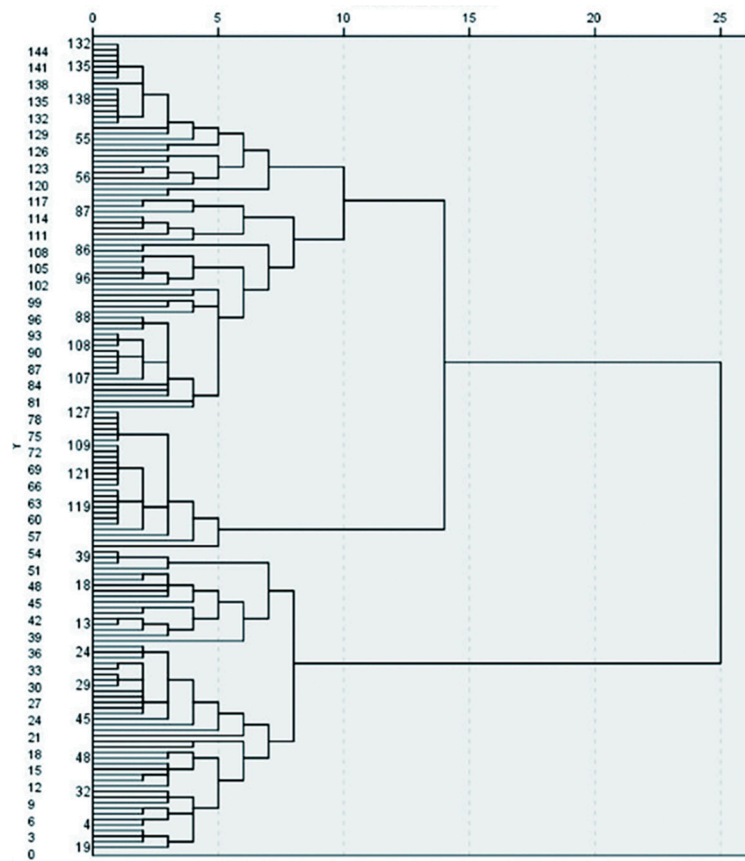


Figure S1 Cluster diagram of phenotypic traits showing clustering relationship of 145 samples of ancient tea plant germplasm

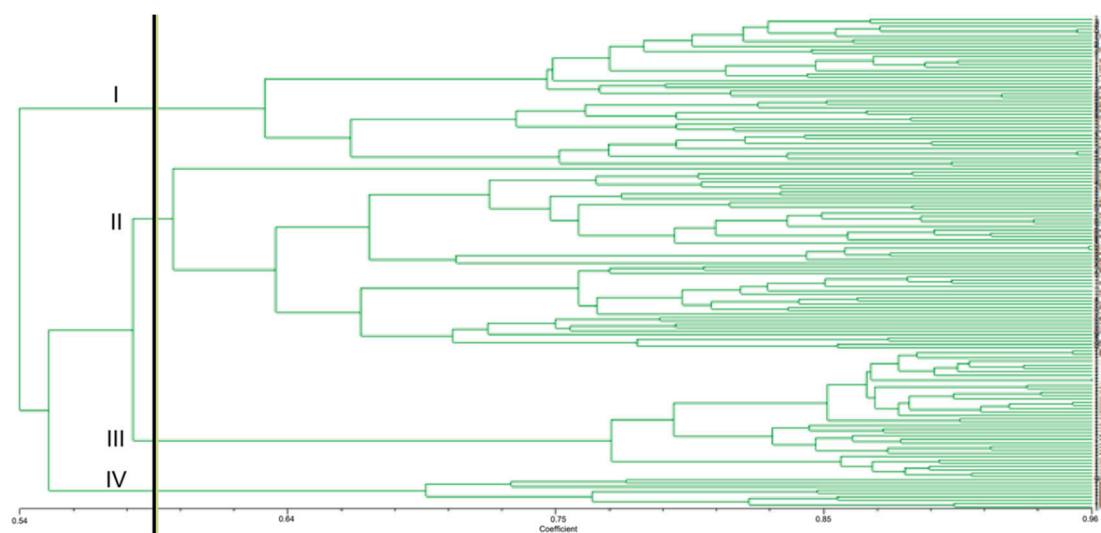


Figure S2 Classification and identification of 145 samples of ancient tea plant germplasm showing genetic relationship based on 15 SSR markers