

Appendix A~K

Appendix A. Detailed information for the 146 Chinese chestnut (*C.mollissima*) accessions and nine chinese chinquapin (*C.henryi*) accessions used in this study

Sample	Name	Species	Cultivars Group	Germplasm	Cultivation region
1	Huijian	<i>Castanea mollissima</i> Bl.	Northwest China	PC	Shanxi,China
2	Mingjian	<i>Castanea mollissima</i> Bl.	Northwest China	PC	Shanxi,China
3	Chunli	<i>Castanea mollissima</i> Bl.	Northwest China	PC	Shanxi,China
4	Zuohongli	<i>Castanea mollissima</i> Bl.	Northwest China	PC	Shanxi,China
5	Zhenbashuangjie	<i>Castanea mollissima</i> Bl.	Northwest China	PC	Shanxi,China
6	zha 18	<i>Castanea mollissima</i> Bl.	Northwest China	LC	Shanxi,China
7	Jingshuhong	<i>Castanea mollissima</i> Bl.	North China	PC	Beijing,China
8	Huaixiang	<i>Castanea mollissima</i> Bl.	North China	PC	Beijing,China
9	Huaihuang	<i>Castanea mollissima</i> Bl.	North China	PC	Beijing,China
10	Huzhaoli	<i>Castanea mollissima</i> Bl.	North China	LC	Beijing,China
11	Huaifeng	<i>Castanea mollissima</i> Bl.	North China	PC	Beijing,China
12	Yanshanhongli	<i>Castanea mollissima</i> Bl.	North China	PC	Beijing,China
13	Xiazhuang	<i>Castanea mollissima</i> Bl.	North China	LC	Beijing,China
14	Xinzhuang 2	<i>Castanea mollissima</i> Bl.	North China	LC	Beijing,China
15	Huaijiu	<i>Castanea mollissima</i> Bl.	North China	PC	Beijing,China
16	Yanchang	<i>Castanea mollissima</i> Bl.	North China	PC	Beijing,China
17	Yanfeng	<i>Castanea mollissima</i> Bl.	North China	PC	Beijing,China
18	Yanshanzaofeng	<i>Castanea mollissima</i> Bl.	North China	NC	Hebei,China
19	Donglimingzhu	<i>Castanea mollissima</i> Bl.	North China	PC	Hebei,China
20	Zipo	<i>Castanea mollissima</i> Bl.	North China	PC	Hebei,China
21	Tasi	<i>Castanea mollissima</i> Bl.	North China	PC	Hebei,China

22	Zundali	<i>Castanea mollissima</i> Bl.	North China	PC	Hebei,China
23	Duanzhiyabian	<i>Castanea mollissima</i> Bl.	North China	PC	Hebei,China
24	Xiaoguan 10	<i>Castanea mollissima</i> Bl.	North China	LC	Hebei,China
25	Yanjing	<i>Castanea mollissima</i> Bl.	North China	PC	Hebei,China
26	Yanshanduanzhi	<i>Castanea mollissima</i> Bl.	North China	PC	Hebei,China
27	Yankui	<i>Castanea mollissima</i> Bl.	North China	PC	Hebei,China
28	Yanguang	<i>Castanea mollissima</i> Bl.	North China	PC	Hebei,China
29	Xingtaifeng 1	<i>Castanea mollissima</i> Bl.	North China	LC	Hebei,China
30	Qianxizaohong	<i>Castanea mollissima</i> Bl.	North China	PC	Hebei,China
31	Yanxing	<i>Castanea mollissima</i> Bl.	North China	PC	Hebei,China
32	Xingtaizaofeng	<i>Castanea mollissima</i> Bl.	North China	PC	Hebei,China
33	Xingtaibopi	<i>Castanea mollissima</i> Bl.	North China	PC	Hebei,China
34	Shimenzaoshuo	<i>Castanea mollissima</i> Bl.	North China	PC	Hebei,China
35	Duancidaqingbao	<i>Castanea mollissima</i> Bl.	North China	PC	Hebei,China
36	Hounanyuchuizhili	<i>Castanea mollissima</i> Bl.	North China	PC	Hebei,China
37	Zunhuaduanci	<i>Castanea mollissima</i> Bl.	North China	PC	Hebei,China
38	Duanzhibanhong	<i>Castanea mollissima</i> Bl.	North China	PC	Hebei,China
39	Taishanboke	<i>Castanea mollissima</i> Bl.	North China	PC	Shandong,China
40	Taishan 1	<i>Castanea mollissima</i> Bl.	North China	LC	Shandong,China
41	Huangpeng	<i>Castanea mollissima</i> Bl.	North China	PC	Shandong,China
42	Shandonghongli	<i>Castanea mollissima</i> Bl.	North China	PC	Shandong,China
43	Jinfeng	<i>Castanea mollissima</i> Bl.	North China	PC	Shandong,China
44	Wuhua	<i>Castanea mollissima</i> Bl.	North China	PC	Shandong,China
45	Yufeng	<i>Castanea mollissima</i> Bl.	North China	PC	Shandong,China
46	Shifeng	<i>Castanea mollissima</i> Bl.	North China	PC	Shandong,China

47	Shangfeng	<i>Castanea mollissima</i> Bl.	North China	PC	Shandong, China
48	Luyuezaofeng	<i>Castanea mollissima</i> Bl.	North China	PC	Shandong, China
49	Shandonghongguang	<i>Castanea mollissima</i> Bl.	North China	PC	Shandong, China
50	Xinxuan 1	<i>Castanea mollissima</i> Bl.	North China	LC	Shandong, China
51	Taili 1	<i>Castanea mollissima</i> Bl.	North China	PC	Shandong, China
52	Huafeng	<i>Castanea mollissima</i> Bl.	North China	PC	Shandong, China
53	Huaguang	<i>Castanea mollissima</i> Bl.	North China	PC	Shandong, China
54	Yanqing	<i>Castanea mollissima</i> Bl.	North China	PC	Shandong, China
55	Heiyanqing	<i>Castanea mollissima</i> Bl.	North China	PC	Shandong, China
56	Dongyuezaofeng	<i>Castanea mollissima</i> Bl.	North China	PC	Shandong, China
57	Daiyuezaofeng	<i>Castanea mollissima</i> Bl.	North China	PC	Shandong, China
58	Chuzhi 1	<i>Castanea mollissima</i> Bl.	North China	LC	Shandong, China
59	Fuzhao	<i>Castanea mollissima</i> Bl.	North China	PC	Shandong, China
60	Huangqianwuhua	<i>Castanea mollissima</i> Bl.	North China	PC	Shandong, China
61	Laixiyouli	<i>Castanea mollissima</i> Bl.	North China	PC	Shandong, China
62	Shilianzihuagai	<i>Castanea mollissima</i> Bl.	North China	PC	Shandong, China
63	Dagongshu 1	<i>Castanea mollissima</i> Bl.	North China	LC	Shandong, China
64	Dagongshu 4	<i>Castanea mollissima</i> Bl.	North China	LC	Shandong, China
65	Dongfeng	<i>Castanea mollissima</i> Bl.	North China	PC	Shandong, China
66	Chuzhi 2	<i>Castanea mollissima</i> Bl.	North China	LC	Shandong, China
67	Nanganlin	<i>Castanea mollissima</i> Bl.	North China	PC	Shandong, China
68	Yanquan	<i>Castanea mollissima</i> Bl.	North China	PC	Shandong, China
69	Fulaidahongpao	<i>Castanea mollissima</i> Bl.	North China	PC	Shandong, China
70	Dagongshu 2	<i>Castanea mollissima</i> Bl.	North China	LC	Shandong, China
71	Xinkuili	<i>Castanea mollissima</i> Bl.	North China	PC	Shandong, China

72	Hongli 3	<i>Castanea mollissima</i> Bl.	North China	LC	Shandong,China
73	Chaoduanzhi 2	<i>Castanea mollissima</i> Bl.	North China	LC	Shandong,China
74	Taishanduanzhi	<i>Castanea mollissima</i> Bl.	North China	PC	Shandong,China
75	Haifeng	<i>Castanea mollissima</i> Bl.	North China	PC	Shandong,China
76	Duanzhi 1	<i>Castanea mollissima</i> Bl.	North China	LC	Shandong,China
77	Duanzhi 3	<i>Castanea mollissima</i> Bl.	North China	LC	Shandong,China
78	Nanganlin 1	<i>Castanea mollissima</i> Bl.	North China	LC	Shandong,China
79	Hongli 4	<i>Castanea mollissima</i> Bl.	North China	LC	Shandong,China
80	Funingboke	<i>Castanea mollissima</i> Bl.	North China	PC	Shandong,China
81	Culaiduanzhi	<i>Castanea mollissima</i> Bl.	North China	PC	Shandong,China
82	Meifeng	<i>Castanea mollissima</i> Bl.	North China	PC	Shandong,China
83	Chuizhi 3	<i>Castanea mollissima</i> Bl.	North China	LC	Shandong,China
84	Yimengduanzhi	<i>Castanea mollissima</i> Bl.	North China	PC	Shandong,China
85	Shandiandaban	<i>Castanea mollissima</i> Bl.	North China	PC	Henan,China
86	Ziyouli	<i>Castanea mollissima</i> Bl.	North China	PC	Henan,China
87	Hongyouli	<i>Castanea mollissima</i> Bl.	North China	PC	Henan,China
88	Gaodian 1	<i>Castanea mollissima</i> Bl.	North China	LC	Henan,China
89	Gaodian 10	<i>Castanea mollissima</i> Bl.	North China	LC	Henan,China
90	Liuyuepao	<i>Castanea mollissima</i> Bl.	Middle and lower reaches of the Yangtze River	PC	Hubei,China
91	Guihuaxiang	<i>Castanea mollissima</i> Bl.	Middle and lower reaches of the Yangtze River	PC	Hubei,China
92	Meiguihong	<i>Castanea mollissima</i> Bl.	Middle and lower reaches of the Yangtze River	PC	Hubei,China
93	Luotianwukeli	<i>Castanea mollissima</i> Bl.	Middle and lower reaches of the Yangtze River	PC	Hubei,China
94	Bayuehong	<i>Castanea mollissima</i> Bl.	Middle and lower reaches of the Yangtze River	PC	Hubei,China
95	Shiyuehan	<i>Castanea mollissima</i> Bl.	Middle and lower reaches of the Yangtze River	PC	Hubei,China
96	Yangmaoli	<i>Castanea mollissima</i> Bl.	Middle and lower reaches of the Yangtze River	PC	Hubei,China

97	Bikouhong	<i>Castanea mollissima</i> Bl.	Middle and lower reaches of the Yangtze River	PC	Hubei,China
98	Luotianzaoli	<i>Castanea mollissima</i> Bl.	Middle and lower reaches of the Yangtze River	PC	Hubei,China
99	Zhongchili	<i>Castanea mollissima</i> Bl.	Middle and lower reaches of the Yangtze River	PC	Hubei,China
100	Qingmaozao	<i>Castanea mollissima</i> Bl.	Middle and lower reaches of the Yangtze River	PC	Hubei,China
101	Hongmaozao	<i>Castanea mollissima</i> Bl.	Middle and lower reaches of the Yangtze River	PC	Hubei,China
102	Jiuyuehan	<i>Castanea mollissima</i> Bl.	Middle and lower reaches of the Yangtze River	PC	Hubei,China
103	Dahongpao	<i>Castanea mollissima</i> Bl.	Middle and lower reaches of the Yangtze River	PC	Anhui,China
104	Chushuhong	<i>Castanea mollissima</i> Bl.	Middle and lower reaches of the Yangtze River	PC	Anhui,China
105	Mifengqiu	<i>Castanea mollissima</i> Bl.	Middle and lower reaches of the Yangtze River	PC	Anhui,China
106	Ningguodahongpao	<i>Castanea mollissima</i> Bl.	Middle and lower reaches of the Yangtze River	PC	Anhui,China
107	Shuchengdahongpao	<i>Castanea mollissima</i> Bl.	Middle and lower reaches of the Yangtze River	PC	Anhui,China
108	Yelicang	<i>Castanea mollissima</i> Bl.	Middle and lower reaches of the Yangtze River	PC	Anhui,China
109	Mao pu	<i>Castanea mollissima</i> Bl.	Middle and lower reaches of the Yangtze River	PC	Anhui,China
110	Yuanniandiban	<i>Castanea mollissima</i> Bl.	Middle and lower reaches of the Yangtze River	PC	Anhui,China
111	Shuanghehongpao	<i>Castanea mollissima</i> Bl.	Middle and lower reaches of the Yangtze River	PC	Anhui,China
112	Chongniandiban	<i>Castanea mollissima</i> Bl.	Middle and lower reaches of the Yangtze River	PC	Anhui,China
113	Jiujiazhong	<i>Castanea mollissima</i> Bl.	Middle and lower reaches of the Yangtze River	PC	Jiangsu,China
114	Jiaoza	<i>Castanea mollissima</i> Bl.	Middle and lower reaches of the Yangtze River	LC	Jiangsu,China
115	Songjiazao	<i>Castanea mollissima</i> Bl.	Middle and lower reaches of the Yangtze River	PC	Jiangsu,China
116	Gaoyuan 1	<i>Castanea mollissima</i> Bl.	Middle and lower reaches of the Yangtze River	LC	Jiangsu,China
117	Shuhedabao	<i>Castanea mollissima</i> Bl.	Middle and lower reaches of the Yangtze River	PC	Jiangsu,China
118	Chali	<i>Castanea mollissima</i> Bl.	Middle and lower reaches of the Yangtze River	PC	Jiangsu,China
119	Tielitou	<i>Castanea mollissima</i> Bl.	Middle and lower reaches of the Yangtze River	PC	Jiangsu,China
120	Dasongjiazao	<i>Castanea mollissima</i> Bl.	Middle and lower reaches of the Yangtze River	PC	Jiangsu,China
121	Duanza	<i>Castanea mollissima</i> Bl.	Middle and lower reaches of the Yangtze River	LC	Jiangsu,China

122	Chongyangpu	<i>Castanea mollissima</i> Bl.	Middle and lower reaches of the Yangtze River	LC	Jiangsu,China
123	Yixingdahongpao	<i>Castanea mollissima</i> Bl.	Middle and lower reaches of the Yangtze River	PC	Jiangsu,China
124	Jiandingyouli	<i>Castanea mollissima</i> Bl.	Middle and lower reaches of the Yangtze River	PC	Jiangsu,China
125	Timayanming	<i>Castanea mollissima</i> Bl.	Middle and lower reaches of the Yangtze River	PC	Jiangsu,China
126	Qingmaoruanci	<i>Castanea mollissima</i> Bl.	Middle and lower reaches of the Yangtze River	PC	Jiangsu,China
127	Yunxiang	<i>Castanea mollissima</i> Bl.	Southwest China	PC	Yunnan,China
128	Yunxiong	<i>Castanea mollissima</i> Bl.	Southwest China	PC	Yunnan,China
129	Yunhong	<i>Castanea mollissima</i> Bl.	Southwest China	PC	Yunnan,China
130	Yunliang	<i>Castanea mollissima</i> Bl.	Southwest China	PC	Yunnan,China
131	Guizhouchili	<i>Castanea mollissima</i> Bl.	Southwest China	PC	Guizhou,China
132	Wangmoxiaobanli	<i>Castanea mollissima</i> Bl.	Southwest China	PC	Guizhou,China
133	Hunanbaoyunzao	<i>Castanea mollissima</i> Bl.	Southeast China	PC	Hunan,China
134	Tali	<i>Castanea mollissima</i> Bl.	Southeast China	PC	Hunan,China
135	Shuangjili	<i>Castanea mollissima</i> Bl.	Southeast China	PC	Hunan,China
136	Jinpingchuili	<i>Castanea mollissima</i> Bl.	Southeast China	PC	Jiangxi,China
137	Guihua	<i>Castanea mollissima</i> Bl.	Southeast China	PC	Jiangxi,China
138	Guangxili	<i>Castanea mollissima</i> Bl.	Southeast China	PC	Guangxi,China
139	Guanxiyulin 1	<i>Castanea mollissima</i> Bl.	Southeast China	LC	Guangxi,China
140	Guangxiyouli	<i>Castanea mollissima</i> Bl.	Southeast China	PC	Guangxi,China
141	Guangdongaisheng	<i>Castanea mollissima</i> Bl.	Southeast China	PC	Guangdong,China
142	Xinnong 1	<i>Castanea mollissima</i> Bl.	Southeast China	LC	Guangdong,China
143	Kuili	<i>Castanea mollissima</i> Bl.	Southeast China	PC	Zejiang,China
144	Shanguang	<i>Castanea mollissima</i> Bl.	Southeast China	PC	Zejiang,China
145	Zhejiangkuili	<i>Castanea mollissima</i> Bl.	Southeast China	PC	Zejiang,China
146	Jiaozatima	<i>Castanea mollissima</i> Bl.	Southeast China	PC	Zejiang,China

148	Bailuzi	<i>Castanea henryi</i> (Skam) Rehd. et Wils.	Ch	PC	Fujian,China
149	Youzhen	<i>Castanea henryi</i> (Skam) Rehd. et Wils.	Ch	PC	Fujian,China
150	Beizhen	<i>Castanea henryi</i> (Skam) Rehd. et Wils.	Ch	PC	Fujian,China
151	Changmangzi	<i>Castanea henryi</i> (Skam) Rehd. et Wils.	Ch	PC	Fujian,China
152	Wukechangmang	<i>Castanea henryi</i> (Skam) Rehd. et Wils.	Ch	PC	Fujian,China
153	Tiezhun	<i>Castanea henryi</i> (Skam) Rehd. et Wils.	Ch	PC	Fujian,China
154	Huangzhen	<i>Castanea henryi</i> (Skam) Rehd. et Wils.	Ch	PC	Fujian,China
155	Shuiyuanyouzhen	<i>Castanea henryi</i> (Skam) Rehd. et Wils.	Ch	PC	Fujian,China

NC: nation cultivar; PC: province cultivar; LC: local cultivar

Appendix B. The information of each SSR markers

Number	Marker ID	GenBank ID	Forward primer (5-3')	Reverse primer (3'-5')	Observed-Motif	LG
1	CmSI0396	290474606	AACTCCCACCACTCACATCC	TTTCGGACCATCCAGAACTC	CACACC	E
2	CmSI0509	290474647	CAAGTCCGATCCTTCCTCTG	AGCTGGGTTTTGAGTAGCGA	ACA	B
3	CmSI0561	290474702	CGTATAGGGTGGAAACGGAA	GGACAAGCAAATCACGGAAT	TCG	D
4	CmSI0585	290474723	TGGGTTTTGTGTTTCTTCAA	GAGGAGCGTTTCAAGACTGG	ATTG	D
5	CmSI0614	290476556	TTGTGGTGAAGCTGACATCG	GGGTACTACCACAACATGCAG	GTT	G
6	CmSI0617	290475843	GCCTCAGCTGGTAACGAAGA	TCACATGGGCTTGTGTAGC	GA	E
7	CmSI0658	290474781	AAAACGGTTTTGTGGTGAAGC	GCCAACCAGTCAAGGGTACT	GTT	G
8	CmSI0702	290474818	GAAACACACCAGAGAGATGCAG	TTTTATACAGAGACATACTATCCTACACAG	TC	G
9	CmSI0735	290474842	ACGCCTCAGTTGCTGTTTC	CAACGGTCTTACCCTTTGGA	AGAA	I
10	CmSI0742	290474850	GACGCTCCTCAGCTTTTGAC	TGCCGGTCAATCTTCTTCT	AG	A
11	CmSI0800	290474899	TTATGGCAACCCTCCTGTTT	CTGAAATGATCGATGCTGCT	TC	E
12	CmSI0809	290474901	GAGCGAGTCGAAGAAGGAAG	ATCTGCTTCGGCACCATCT	GGT	B
13	CmSI0853	290474950	GGAGGAGGAGGAGCTCATTG	CCTTGAGAGCTGCCAGTAG	TCT	K
14	CmSI0871	290474967	AGGGGGTGAAGAACCTATG	AGATTGCAAGTGGGAATTG	TCT	A
15	CmSI0883	290476060	CAGCATCAGCACTCGTTCA	GGGATTGAGAGGATGAAGCA	AGC	E
16	CmSI0922	290475011	AATCTGAACCCCTCCGATCT	ACCAACAACATGTGCCAAAA	TTG	K
17	CmSI0930	290475019	CCATTTAGCATGCATAGTCATACC	GCAAGGATGTAGGTGCAATCA	ATAC	F
18	CmSI0933	290475025	AGGCCTCTTCTCCCTTGTGT	TCCTGTTCTATGCTGCTCA	AGA	I

Appendix C. The frequency distribution of alleles in different cultivar groups

Marker	Allele	Frequency distribution of cultivar groups				
		Middle and lower reaches of the Yangtze River	Southeast China	North China	Northwest China	Southwest China
CmSI0396	185	0.512	0.577	0.532	0.583	0.500
CmSI0396	191	0.393	0.308	0.340	0.167	0.429
CmSI0396	197	0.071	0.077	0.083	0.167	0.071
CmSI0396	203	0.024	0.038	0.045	0.083	0.000
CmSI0509	110	0.036	0.077	0.071	0.000	0.143
CmSI0509	115	0.000	0.077	0.006	0.083	0.000
CmSI0509	118	0.476	0.500	0.372	0.417	0.643
CmSI0509	121	0.262	0.115	0.090	0.167	0.143
CmSI0509	124	0.226	0.231	0.455	0.333	0.071
CmSI0509	127	0.000	0.000	0.006	0.000	0.000
CmSI0561	159	0.000	0.000	0.013	0.000	0.000
CmSI0561	162	0.060	0.115	0.128	0.167	0.071
CmSI0561	165	0.202	0.154	0.231	0.167	0.071
CmSI0561	171	0.583	0.577	0.410	0.500	0.786
CmSI0561	174	0.012	0.000	0.019	0.000	0.000
CmSI0561	177	0.024	0.077	0.096	0.083	0.071
CmSI0561	180	0.095	0.038	0.096	0.083	0.000
CmSI0561	183	0.024	0.038	0.006	0.000	0.000
CmSI0585	144	0.000	0.000	0.000	0.083	0.000
CmSI0585	170	0.417	0.692	0.494	0.333	0.429

CmSI0585	172	0.262	0.154	0.244	0.333	0.071
CmSI0585	174	0.036	0.000	0.032	0.083	0.000
CmSI0585	176	0.071	0.077	0.064	0.083	0.071
CmSI0585	178	0.024	0.000	0.032	0.000	0.143
CmSI0585	180	0.060	0.000	0.058	0.000	0.214
CmSI0585	182	0.131	0.077	0.077	0.083	0.071
CmSI0614	162	0.024	0.000	0.064	0.083	0.000
CmSI0614	165	0.012	0.000	0.019	0.000	0.000
CmSI0614	174	0.226	0.308	0.269	0.417	0.214
CmSI0614	177	0.179	0.269	0.212	0.083	0.214
CmSI0614	180	0.202	0.115	0.135	0.000	0.214
CmSI0614	183	0.226	0.077	0.135	0.083	0.143
CmSI0614	186	0.131	0.231	0.160	0.333	0.214
CmSI0614	192	0.000	0.000	0.006	0.000	0.000
CmSI0617	156	0.143	0.077	0.071	0.083	0.214
CmSI0617	158	0.333	0.385	0.186	0.417	0.286
CmSI0617	162	0.048	0.154	0.141	0.167	0.000
CmSI0617	164	0.000	0.038	0.013	0.000	0.000
CmSI0617	166	0.333	0.231	0.487	0.167	0.357
CmSI0617	168	0.024	0.038	0.064	0.000	0.143
CmSI0617	170	0.119	0.077	0.038	0.167	0.000
CmSI0658	184	0.036	0.000	0.071	0.083	0.000
CmSI0658	196	0.226	0.308	0.288	0.417	0.143
CmSI0658	199	0.167	0.269	0.212	0.083	0.214

CmSI0658	202	0.238	0.154	0.141	0.000	0.143
CmSI0658	205	0.202	0.077	0.147	0.250	0.214
CmSI0658	208	0.131	0.192	0.135	0.167	0.286
CmSI0658	211	0.000	0.000	0.006	0.000	0.000
CmSI0702	153	0.000	0.000	0.006	0.000	0.000
CmSI0702	157	0.202	0.385	0.237	0.667	0.286
CmSI0702	159	0.000	0.000	0.000	0.000	0.071
CmSI0702	161	0.452	0.462	0.564	0.333	0.143
CmSI0702	163	0.024	0.038	0.051	0.000	0.143
CmSI0702	165	0.321	0.115	0.141	0.000	0.357
CmSI0735	126	0.083	0.038	0.051	0.000	0.000
CmSI0735	130	0.036	0.115	0.071	0.083	0.000
CmSI0735	134	0.000	0.000	0.045	0.000	0.000
CmSI0735	138	0.464	0.538	0.513	0.500	0.500
CmSI0735	142	0.417	0.308	0.321	0.417	0.500
CmSI0742	149	0.405	0.423	0.359	0.333	0.286
CmSI0742	151	0.095	0.115	0.077	0.083	0.143
CmSI0742	153	0.167	0.192	0.154	0.250	0.143
CmSI0742	157	0.333	0.269	0.410	0.333	0.429
CmSI0800	132	0.024	0.000	0.013	0.000	0.000
CmSI0800	134	0.024	0.000	0.032	0.000	0.000
CmSI0800	136	0.488	0.385	0.519	0.667	0.429
CmSI0800	138	0.167	0.269	0.218	0.250	0.214
CmSI0800	140	0.107	0.192	0.051	0.000	0.143

CmSI0800	142	0.036	0.000	0.006	0.000	0.000
CmSI0800	144	0.024	0.000	0.019	0.000	0.000
CmSI0800	146	0.036	0.038	0.051	0.083	0.071
CmSI0800	148	0.000	0.000	0.006	0.000	0.000
CmSI0800	150	0.048	0.077	0.032	0.000	0.071
CmSI0800	152	0.000	0.038	0.000	0.000	0.071
CmSI0800	154	0.024	0.000	0.013	0.000	0.000
CmSI0800	158	0.000	0.000	0.032	0.000	0.000
CmSI0800	166	0.012	0.000	0.006	0.000	0.000
CmSI0800	168	0.012	0.000	0.000	0.000	0.000
CmSI0809	114	0.274	0.308	0.500	0.083	0.214
CmSI0809	117	0.107	0.077	0.109	0.250	0.000
CmSI0809	126	0.357	0.385	0.186	0.250	0.500
CmSI0809	132	0.262	0.231	0.205	0.417	0.286
CmSI0853	255	0.012	0.000	0.000	0.000	0.000
CmSI0853	258	0.060	0.038	0.058	0.083	0.000
CmSI0853	261	0.250	0.192	0.147	0.167	0.143
CmSI0853	264	0.250	0.308	0.256	0.250	0.286
CmSI0853	267	0.119	0.038	0.090	0.167	0.214
CmSI0853	270	0.202	0.385	0.321	0.083	0.214
CmSI0853	273	0.107	0.038	0.128	0.250	0.000
CmSI0853	276	0.000	0.000	0.000	0.000	0.143
CmSI0871	175	0.000	0.000	0.006	0.000	0.000
CmSI0871	178	0.333	0.308	0.321	0.333	0.357

CmSI0871	181	0.060	0.077	0.090	0.000	0.071
CmSI0871	184	0.000	0.038	0.000	0.000	0.000
CmSI0871	187	0.595	0.577	0.583	0.667	0.571
CmSI0871	193	0.012	0.000	0.000	0.000	0.000
CmSI0883	181	0.000	0.038	0.000	0.000	0.000
CmSI0883	193	0.000	0.000	0.000	0.167	0.000
CmSI0883	196	0.238	0.308	0.167	0.333	0.286
CmSI0883	199	0.131	0.192	0.173	0.083	0.143
CmSI0883	202	0.321	0.154	0.449	0.250	0.286
CmSI0883	208	0.083	0.115	0.019	0.000	0.000
CmSI0883	211	0.036	0.000	0.013	0.167	0.000
CmSI0883	214	0.190	0.192	0.179	0.000	0.286
CmSI0922	327	0.012	0.000	0.000	0.000	0.000
CmSI0922	330	0.190	0.192	0.103	0.083	0.071
CmSI0922	333	0.060	0.038	0.013	0.083	0.071
CmSI0922	336	0.167	0.192	0.256	0.083	0.214
CmSI0922	339	0.167	0.115	0.205	0.167	0.286
CmSI0922	342	0.226	0.154	0.179	0.500	0.214
CmSI0922	345	0.024	0.000	0.006	0.000	0.071
CmSI0922	348	0.083	0.077	0.167	0.000	0.000
CmSI0922	351	0.071	0.231	0.071	0.083	0.071
CmSI0930	255	0.000	0.038	0.006	0.000	0.143
CmSI0930	259	0.000	0.000	0.013	0.167	0.000
CmSI0930	263	0.083	0.115	0.115	0.000	0.000

CmSI0930	265	0.024	0.000	0.000	0.000	0.071
CmSI0930	267	0.131	0.038	0.051	0.000	0.286
CmSI0930	269	0.000	0.000	0.019	0.000	0.000
CmSI0930	271	0.119	0.231	0.212	0.083	0.000
CmSI0930	273	0.036	0.038	0.006	0.000	0.143
CmSI0930	275	0.393	0.462	0.506	0.583	0.214
CmSI0930	277	0.012	0.000	0.000	0.000	0.000
CmSI0930	279	0.071	0.000	0.006	0.083	0.071
CmSI0930	281	0.012	0.000	0.000	0.000	0.000
CmSI0930	283	0.095	0.038	0.038	0.083	0.071
CmSI0930	285	0.024	0.000	0.006	0.000	0.000
CmSI0930	287	0.000	0.038	0.019	0.000	0.000
CmSI0933	141	0.750	0.731	0.571	0.750	0.500
CmSI0933	144	0.072	0.038	0.115	0.083	0.143
CmSI0933	147	0.179	0.192	0.295	0.167	0.357
CmSI0933	150	0.000	0.038	0.019	0.000	0.000
Proportion	-	82.7%	69.9%	89.5%	57.9%	60.2%

Appendix D. The frequency distribution of 305 locus genotypes with 18 SSR markers

Nu	Marker	Allele1	Allele2	Covariance	Count	Freq
1	CmSI0396	185	185	0.0005	25	0.1712
2	CmSI0396	185	191	0.0003	79	0.5411
3	CmSI0396	185	197	0.0001	17	0.1164
4	CmSI0396	185	203	0.0000	9	0.0616
5	CmSI0396	191	191	0.0006	9	0.0616
6	CmSI0396	191	197	0.0001	5	0.0342
7	CmSI0396	197	203	0.0000	2	0.0137
8	CmSI0509	110	118	0.0001	6	0.0411
9	CmSI0509	110	121	0.0000	3	0.0205
10	CmSI0509	110	124	0.0000	9	0.0616
11	CmSI0509	115	115	0.0001	1	0.0068
12	CmSI0509	115	118	0.0000	2	0.0137
13	CmSI0509	118	118	0.0010	33	0.2260
14	CmSI0509	118	121	0.0001	27	0.1849
15	CmSI0509	118	124	0.0007	24	0.1644
16	CmSI0509	121	121	0.0005	5	0.0342
17	CmSI0509	121	124	0.0003	2	0.0137
18	CmSI0509	121	127	0.0000	1	0.0068
19	CmSI0509	124	124	0.0011	33	0.2260
20	CmSI0561	159	162	0.0000	1	0.0068
21	CmSI0561	159	165	0.0000	1	0.0068
22	CmSI0561	162	165	0.0001	6	0.0411
23	CmSI0561	162	171	0.0002	13	0.0890
24	CmSI0561	162	177	0.0000	4	0.0274
25	CmSI0561	162	180	0.0000	7	0.0479
26	CmSI0561	165	165	0.0007	12	0.0822
27	CmSI0561	165	171	0.0005	18	0.1233
28	CmSI0561	165	174	0.0000	1	0.0068
29	CmSI0561	165	177	0.0001	2	0.0137
30	CmSI0561	165	180	0.0000	8	0.0548
31	CmSI0561	171	171	0.0010	43	0.2945
32	CmSI0561	171	174	0.0000	2	0.0137
33	CmSI0561	171	177	0.0001	14	0.0959
34	CmSI0561	171	180	0.0002	8	0.0548
35	CmSI0561	171	183	0.0000	4	0.0274
36	CmSI0561	174	180	0.0000	1	0.0068
37	CmSI0561	177	180	0.0000	1	0.0068
38	CmSI0585	144	170	0.0000	1	0.0068
39	CmSI0585	170	170	0.0010	39	0.2671
40	CmSI0585	170	172	0.0006	17	0.1164

41	CmSI0585	170	174	0.0000	7	0.0479
42	CmSI0585	170	176	0.0001	11	0.0753
43	CmSI0585	170	178	0.0001	4	0.0274
44	CmSI0585	170	180	0.0001	6	0.0411
45	CmSI0585	170	182	0.0001	16	0.1096
46	CmSI0585	172	172	0.0009	19	0.1301
47	CmSI0585	172	174	0.0000	2	0.0137
48	CmSI0585	172	176	0.0001	4	0.0274
49	CmSI0585	172	180	0.0000	5	0.0342
50	CmSI0585	172	182	0.0001	3	0.0205
51	CmSI0585	176	180	0.0000	2	0.0137
52	CmSI0585	176	182	0.0000	3	0.0205
53	CmSI0585	178	178	0.0001	1	0.0068
54	CmSI0585	178	182	0.0000	3	0.0205
55	CmSI0585	180	180	0.0002	2	0.0137
56	CmSI0585	182	182	0.0003	1	0.0068
57	CmSI0614	162	174	0.0000	11	0.0753
58	CmSI0614	162	186	0.0000	2	0.0137
59	CmSI0614	165	165	0.0001	1	0.0068
60	CmSI0614	165	177	0.0000	2	0.0137
61	CmSI0614	174	174	0.0008	17	0.1164
62	CmSI0614	174	177	0.0003	3	0.0205
63	CmSI0614	174	180	0.0002	4	0.0274
64	CmSI0614	174	183	0.0001	12	0.0822
65	CmSI0614	174	186	0.0002	13	0.0890
66	CmSI0614	177	177	0.0007	12	0.0822
67	CmSI0614	177	180	0.0001	10	0.0685
68	CmSI0614	177	183	0.0001	10	0.0685
69	CmSI0614	177	186	0.0001	10	0.0685
70	CmSI0614	180	180	0.0005	5	0.0342
71	CmSI0614	180	183	0.0000	11	0.0753
72	CmSI0614	180	186	0.0001	9	0.0616
73	CmSI0614	183	183	0.0004	3	0.0205
74	CmSI0614	183	186	0.0001	5	0.0342
75	CmSI0614	183	192	0.0000	1	0.0068
76	CmSI0614	186	186	0.0005	5	0.0342
77	CmSI0617	156	156	0.0003	1	0.0068
78	CmSI0617	156	158	0.0001	9	0.0616
79	CmSI0617	156	162	0.0000	6	0.0411
80	CmSI0617	156	166	0.0002	8	0.0548
81	CmSI0617	156	168	0.0000	1	0.0068
82	CmSI0617	156	170	0.0000	3	0.0205

83	CmSI0617	158	158	0.0006	8	0.0548
84	CmSI0617	158	162	0.0001	9	0.0616
85	CmSI0617	158	164	0.0000	1	0.0068
86	CmSI0617	158	166	0.0004	31	0.2123
87	CmSI0617	158	168	0.0001	2	0.0137
88	CmSI0617	158	170	0.0000	8	0.0548
89	CmSI0617	162	162	0.0004	4	0.0274
90	CmSI0617	162	164	0.0000	1	0.0068
91	CmSI0617	162	166	0.0002	5	0.0342
92	CmSI0617	162	168	0.0000	3	0.0205
93	CmSI0617	164	166	0.0000	1	0.0068
94	CmSI0617	166	166	0.0010	29	0.1986
95	CmSI0617	166	168	0.0001	7	0.0479
96	CmSI0617	166	170	0.0001	7	0.0479
97	CmSI0617	168	170	0.0000	2	0.0137
98	CmSI0658	184	196	-0.0001	13	0.0890
99	CmSI0658	184	208	0.0000	2	0.0137
100	CmSI0658	196	196	0.0008	17	0.1164
101	CmSI0658	196	199	0.0004	1	0.0068
102	CmSI0658	196	202	0.0003	3	0.0205
103	CmSI0658	196	205	0.0002	12	0.0822
104	CmSI0658	196	208	0.0001	16	0.1096
105	CmSI0658	199	199	0.0007	11	0.0753
106	CmSI0658	199	202	0.0001	12	0.0822
107	CmSI0658	199	205	0.0001	11	0.0753
108	CmSI0658	199	208	0.0001	11	0.0753
109	CmSI0658	199	211	0.0000	1	0.0068
110	CmSI0658	202	202	0.0005	7	0.0479
111	CmSI0658	202	205	0.0001	11	0.0753
112	CmSI0658	202	208	0.0001	8	0.0548
113	CmSI0658	205	205	0.0005	5	0.0342
114	CmSI0658	205	208	0.0001	4	0.0274
115	CmSI0658	208	208	0.0004	1	0.0068
116	CmSI0702	153	157	0.0000	1	0.0068
117	CmSI0702	157	157	0.0008	18	0.1233
118	CmSI0702	157	161	0.0006	26	0.1781
119	CmSI0702	157	163	0.0000	7	0.0479
120	CmSI0702	157	165	0.0003	6	0.0411
121	CmSI0702	159	165	0.0000	1	0.0068
122	CmSI0702	161	161	0.0010	43	0.2945
123	CmSI0702	161	163	0.0001	6	0.0411
124	CmSI0702	161	165	0.0004	26	0.1781

125	CmSI0702	165	165	0.0007	12	0.0822
126	CmSI0735	126	126	0.0002	2	0.0137
127	CmSI0735	126	130	0.0000	1	0.0068
128	CmSI0735	126	134	0.0000	1	0.0068
129	CmSI0735	126	138	0.0002	1	0.0068
130	CmSI0735	126	142	0.0000	9	0.0616
131	CmSI0735	130	130	0.0002	2	0.0137
132	CmSI0735	130	134	0.0000	2	0.0137
133	CmSI0735	130	138	0.0002	5	0.0342
134	CmSI0735	130	142	0.0001	6	0.0411
135	CmSI0735	134	138	0.0000	4	0.0274
136	CmSI0735	138	138	0.0011	46	0.3151
137	CmSI0735	138	142	0.0007	44	0.3014
138	CmSI0735	142	142	0.0009	23	0.1575
139	CmSI0742	149	149	0.0009	23	0.1575
140	CmSI0742	149	151	0.0001	7	0.0479
141	CmSI0742	149	153	0.0002	20	0.1370
142	CmSI0742	149	157	0.0005	36	0.2466
143	CmSI0742	151	153	0.0000	10	0.0685
144	CmSI0742	151	157	0.0001	9	0.0616
145	CmSI0742	153	153	0.0005	5	0.0342
146	CmSI0742	153	157	0.0003	8	0.0548
147	CmSI0742	157	157	0.0010	28	0.1918
148	CmSI0800	132	136	0.0000	1	0.0068
149	CmSI0800	132	138	0.0000	1	0.0068
150	CmSI0800	132	140	0.0000	1	0.0068
151	CmSI0800	132	166	0.0000	1	0.0068
152	CmSI0800	134	136	0.0000	4	0.0274
153	CmSI0800	134	140	0.0000	2	0.0137
154	CmSI0800	134	142	0.0000	1	0.0068
155	CmSI0800	136	136	0.0011	47	0.3219
156	CmSI0800	136	138	0.0006	14	0.0959
157	CmSI0800	136	140	0.0002	10	0.0685
158	CmSI0800	136	142	0.0000	2	0.0137
159	CmSI0800	136	144	0.0000	1	0.0068
160	CmSI0800	136	146	0.0001	8	0.0548
161	CmSI0800	136	150	0.0001	4	0.0274
162	CmSI0800	136	154	0.0000	1	0.0068
163	CmSI0800	136	158	0.0000	5	0.0342
164	CmSI0800	136	166	0.0000	1	0.0068
165	CmSI0800	136	168	0.0000	1	0.0068
166	CmSI0800	138	138	0.0008	15	0.1027

167	CmSI0800	138	140	0.0001	2	0.0137
168	CmSI0800	138	142	0.0000	1	0.0068
169	CmSI0800	138	146	0.0000	3	0.0205
170	CmSI0800	138	148	0.0000	1	0.0068
171	CmSI0800	138	150	0.0000	8	0.0548
172	CmSI0800	138	152	0.0000	1	0.0068
173	CmSI0800	140	140	0.0003	2	0.0137
174	CmSI0800	140	146	0.0000	1	0.0068
175	CmSI0800	140	152	0.0000	1	0.0068
176	CmSI0800	140	154	0.0000	3	0.0205
177	CmSI0800	144	144	0.0001	1	0.0068
178	CmSI0800	144	146	0.0000	2	0.0137
179	CmSI0809	114	114	0.0009	26	0.1781
180	CmSI0809	114	117	0.0000	20	0.1370
181	CmSI0809	114	126	0.0005	22	0.1507
182	CmSI0809	114	132	0.0004	19	0.1301
183	CmSI0809	117	117	0.0003	1	0.0068
184	CmSI0809	117	126	0.0001	7	0.0479
185	CmSI0809	117	132	0.0001	2	0.0137
186	CmSI0809	126	126	0.0008	15	0.1027
187	CmSI0809	126	132	0.0002	20	0.1370
188	CmSI0809	132	132	0.0008	14	0.0959
189	CmSI0853	255	261	0.0000	1	0.0068
190	CmSI0853	258	264	0.0001	3	0.0205
191	CmSI0853	258	270	0.0000	7	0.0479
192	CmSI0853	258	273	0.0000	6	0.0411
193	CmSI0853	261	261	0.0005	6	0.0411
194	CmSI0853	261	264	0.0001	18	0.1233
195	CmSI0853	261	267	0.0001	4	0.0274
196	CmSI0853	261	270	0.0002	9	0.0616
197	CmSI0853	261	273	0.0000	9	0.0616
198	CmSI0853	264	264	0.0006	8	0.0548
199	CmSI0853	264	267	0.0001	10	0.0685
200	CmSI0853	264	270	0.0002	26	0.1781
201	CmSI0853	264	273	0.0002	3	0.0205
202	CmSI0853	267	267	0.0003	3	0.0205
203	CmSI0853	267	270	0.0001	5	0.0342
204	CmSI0853	267	273	0.0000	5	0.0342
205	CmSI0853	270	270	0.0007	12	0.0822
206	CmSI0853	270	273	0.0001	10	0.0685
207	CmSI0853	276	276	0.0000	1	0.0068
208	CmSI0871	175	178	0.0000	1	0.0068

209	CmSI0871	178	178	0.0007	12	0.0822
210	CmSI0871	178	181	0.0001	9	0.0616
211	CmSI0871	178	184	0.0000	1	0.0068
212	CmSI0871	178	187	0.0006	60	0.4110
213	CmSI0871	181	181	0.0003	2	0.0137
214	CmSI0871	181	187	0.0002	9	0.0616
215	CmSI0871	187	187	0.0008	51	0.3493
216	CmSI0871	187	193	0.0000	1	0.0068
217	CmSI0883	181	208	0.0000	1	0.0068
218	CmSI0883	193	202	0.0000	2	0.0137
219	CmSI0883	196	196	0.0007	12	0.0822
220	CmSI0883	196	199	0.0002	5	0.0342
221	CmSI0883	196	202	0.0004	10	0.0685
222	CmSI0883	196	208	0.0000	4	0.0274
223	CmSI0883	196	211	0.0000	1	0.0068
224	CmSI0883	196	214	0.0001	18	0.1233
225	CmSI0883	199	199	0.0005	5	0.0342
226	CmSI0883	199	202	0.0002	18	0.1233
227	CmSI0883	199	208	0.0000	2	0.0137
228	CmSI0883	199	211	0.0000	1	0.0068
229	CmSI0883	199	214	0.0001	10	0.0685
230	CmSI0883	202	202	0.0010	30	0.2055
231	CmSI0883	202	208	0.0001	3	0.0205
232	CmSI0883	202	211	0.0000	5	0.0342
233	CmSI0883	202	214	0.0003	10	0.0685
234	CmSI0883	208	214	0.0000	3	0.0205
235	CmSI0883	214	214	0.0005	6	0.0411
236	CmSI0922	327	336	0.0000	1	0.0068
237	CmSI0922	330	330	0.0005	7	0.0479
238	CmSI0922	330	336	0.0001	5	0.0342
239	CmSI0922	330	339	0.0001	9	0.0616
240	CmSI0922	330	342	0.0001	5	0.0342
241	CmSI0922	330	351	0.0000	6	0.0411
242	CmSI0922	333	333	0.0001	1	0.0068
243	CmSI0922	333	336	0.0000	3	0.0205
244	CmSI0922	333	339	0.0000	1	0.0068
245	CmSI0922	333	342	0.0000	3	0.0205
246	CmSI0922	333	351	0.0000	1	0.0068
247	CmSI0922	336	336	0.0007	11	0.0753
248	CmSI0922	336	339	0.0002	8	0.0548
249	CmSI0922	336	342	0.0002	11	0.0753
250	CmSI0922	336	348	0.0001	9	0.0616

251	CmSI0922	336	351	0.0001	4	0.0274
252	CmSI0922	339	339	0.0006	7	0.0479
253	CmSI0922	339	342	0.0002	9	0.0616
254	CmSI0922	339	348	0.0001	7	0.0479
255	CmSI0922	339	351	0.0000	7	0.0479
256	CmSI0922	342	342	0.0007	11	0.0753
257	CmSI0922	342	345	0.0000	2	0.0137
258	CmSI0922	342	348	0.0001	6	0.0411
259	CmSI0922	342	351	0.0001	2	0.0137
260	CmSI0922	345	345	0.0001	1	0.0068
261	CmSI0922	348	348	0.0004	5	0.0342
262	CmSI0922	348	351	0.0000	3	0.0205
263	CmSI0922	351	351	0.0003	1	0.0068
264	CmSI0930	255	255	0.0001	1	0.0068
265	CmSI0930	255	271	0.0000	1	0.0068
266	CmSI0930	255	275	0.0000	1	0.0068
267	CmSI0930	259	271	0.0000	1	0.0068
268	CmSI0930	259	275	0.0000	3	0.0205
269	CmSI0930	263	263	0.0003	1	0.0068
270	CmSI0930	263	267	0.0000	2	0.0137
271	CmSI0930	263	271	0.0001	4	0.0274
272	CmSI0930	263	273	0.0000	1	0.0068
273	CmSI0930	263	275	0.0001	13	0.0890
274	CmSI0930	263	279	0.0000	1	0.0068
275	CmSI0930	263	283	0.0000	1	0.0068
276	CmSI0930	263	285	0.0000	2	0.0137
277	CmSI0930	263	287	0.0000	2	0.0137
278	CmSI0930	265	273	0.0000	1	0.0068
279	CmSI0930	265	281	0.0000	1	0.0068
280	CmSI0930	265	285	0.0000	1	0.0068
281	CmSI0930	267	267	0.0003	2	0.0137
282	CmSI0930	267	271	0.0001	2	0.0137
283	CmSI0930	267	273	0.0000	1	0.0068
284	CmSI0930	267	275	0.0002	6	0.0411
285	CmSI0930	267	279	0.0000	4	0.0274
286	CmSI0930	267	283	0.0000	5	0.0342
287	CmSI0930	269	269	0.0001	1	0.0068
288	CmSI0930	269	273	0.0000	1	0.0068
289	CmSI0930	271	271	0.0006	8	0.0548
290	CmSI0930	271	275	0.0002	26	0.1781
291	CmSI0930	273	273	0.0001	1	0.0068
292	CmSI0930	273	277	0.0000	1	0.0068

293	CmSI0930	275	275	0.0010	38	0.2603
294	CmSI0930	275	279	0.0001	2	0.0137
295	CmSI0930	275	283	0.0001	7	0.0479
296	CmSI0930	279	279	0.0001	1	0.0068
297	CmSI0930	283	283	0.0002	1	0.0068
298	CmSI0930	283	287	0.0000	2	0.0137
299	CmSI0933	141	141	0.0010	67	0.4589
300	CmSI0933	141	144	0.0000	13	0.0890
301	CmSI0933	141	147	0.0007	38	0.2603
302	CmSI0933	141	150	0.0000	2	0.0137
303	CmSI0933	144	147	-0.0001	15	0.1027
304	CmSI0933	147	147	0.0006	9	0.0616
305	CmSI0933	147	150	0.0000	2	0.0137

Appendix E. Fingerprinting of 146 accessions with seven core markers

Name	Origin	CmSI0396	CmSI0509	CmSI0561	CmSI0800	CmSI0933	CmSI0922	CmSI0614
Huijian	Shanxi,China	185/191	118/124	171/177	138/146	141/147	336/342	162/186
Mingjian	Shanxi,China	185/191	115/118	165/165	136/136	141/141	339/342	174/183
Chunli	Shanxi,China	185/203	118/124	162/171	136/136	141/141	342/342	174/177
Zuohongli	Shanxi,China	185/197	118/121	171/171	136/138	141/141	330/342	186/186
Zhenbashuangjie	Shanxi,China	185/185	124/124	162/180	136/136	144/147	333/342	174/186
zha 18	Shanxi,China	185/197	118/121	171/171	136/138	141/141	339/351	174/174
Jingshuhong	Beijing,China	185/197	124/124	162/171	136/136	141/147	333/339	174/186
Huaixiang	Beijing,China	185/185	118/118	171/177	138/150	144/147	342/348	174/183
Huaihuang	Beijing,China	185/191	110/118	171/177	136/146	141/147	336/339	174/186
Huzhaoli	Beijing,China	185/191	124/124	171/171	136/136	147/147	336/336	177/177
Huaifeng	Beijing,China	185/185	118/118	171/177	136/136	144/147	342/348	174/183
Yanshanhongli	Beijing,China	191/191	118/124	162/165	136/136	141/144	336/339	162/174
Xiazhuang 4	Beijing,China	185/191	124/124	162/180	136/158	141/141	336/336	183/186
Xinzhuang 2	Beijing,China	185/191	118/121	165/180	136/136	141/141	342/342	165/177
Huaijiu	Beijing,China	185/185	110/118	171/177	136/144	141/141	339/342	186/186
Yanchang	Beijing,China	185/191	118/121	165/171	134/136	141/141	330/339	177/180
Yanfeng	Beijing,China	185/197	118/124	165/165	138/138	144/147	348/348	180/183
Yanshanzaofeng	Hebei,China	185/185	124/124	162/180	136/136	147/150	348/348	174/186
Donglimingzhu	Hebei,China	185/197	124/124	171/171	144/146	147/147	330/339	174/174
Zipo	Hebei,China	185/185	124/124	162/171	138/138	147/147	339/339	174/174
Tasi	Hebei,China	185/185	124/124	165/165	136/136	141/150	336/336	186/186
Zundali	Hebei,China	185/191	124/124	162/171	136/136	141/141	330/336	174/186
Duanzhiyabian	Hebei,China	185/191	124/124	162/165	138/138	141/147	339/348	162/174

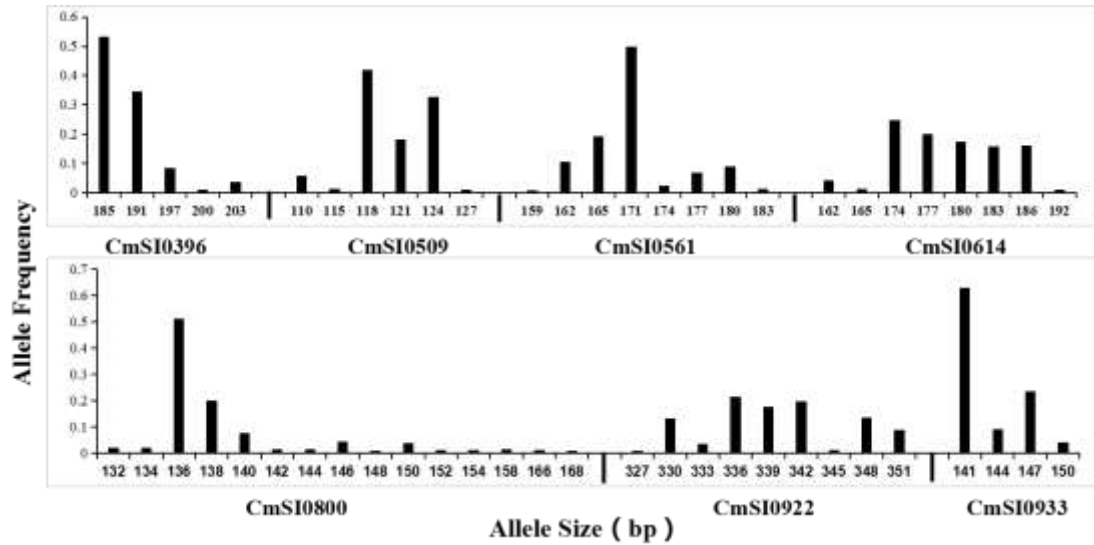
Xiaoguan 10	Hebei,China	185/185	124/124	171/180	136/158	141/147	336/348	162/174
Yanjing	Hebei,China	191/191	124/124	171/180	136/138	141/147	336/348	162/174
Yanshanduanzhi	Hebei,China	191/191	124/124	162/165	136/136	141/141	336/339	177/186
Yankui	Hebei,China	185/185	124/124	162/171	136/142	147/147	339/348	162/174
Yanguang	Hebei,China	185/191	124/124	162/180	138/148	141/147	342/342	174/183
Xingtaifeng 1	Hebei,China	185/191	110/124	162/177	136/146	141/147	336/348	177/177
Qianxizaohong	Hebei,China	185/191	124/124	159/162	136/146	141/141	339/348	174/174
Yanxing	Hebei,China	185/191	124/124	162/171	136/136	141/144	339/339	174/174
Xingtaizaofeng	Hebei,China	191/197	124/124	162/171	138/150	141/150	336/348	177/186
Xingtaibopi	Hebei,China	185/191	118/124	171/171	136/136	141/141	339/342	183/186
Shimenzaoshuo	Hebei,China	185/203	118/118	171/180	136/140	141/147	339/342	174/183
Duancidaqingbao	Hebei,China	185/191	118/121	171/171	138/138	144/147	336/342	177/180
Hounanyuchuizhili	Hebei,China	185/191	124/124	171/180	136/136	141/147	330/336	174/186
Zunhuaduanqi	Hebei,China	185/191	124/124	171/171	144/146	144/147	330/339	174/174
Duanzhibanhong	Hebei,China	185/191	121/127	171/171	138/138	141/144	342/342	177/180
Taishanboke	Shandong,China	185/191	110/124	162/177	138/146	144/147	336/342	180/186
Taishan 1	Shandong,China	185/191	118/124	165/165	136/136	141/141	336/348	162/174
Huangpeng	Shandong,China	185/191	118/124	162/171	136/136	144/147	339/342	174/177
Shandonghongli	Shandong,China	185/191	118/124	165/177	138/138	141/147	336/336	174/186
Jinfeng	Shandong,China	185/197	110/121	171/180	136/136	141/147	336/342	177/183
Wuhua	Shandong,China	185/197	124/124	159/165	136/136	141/147	336/336	174/174
Yufeng	Shandong,China	197/203	118/124	165/171	138/150	141/141	339/351	177/177
Shifeng	Shandong,China	185/191	118/118	171/177	136/136	144/147	342/348	174/183
Shangfeng	Shandong,China	185/191	121/124	165/165	136/136	141/141	336/351	177/177
Luyuezaofeng	Shandong,China	185/191	118/124	165/180	136/136	141/141	339/339	162/174

Shandonghongguang	Shandong,China	185/197	118/124	165/165	136/136	141/141	336/348	162/174
Xinxuan 1	Shandong,China	185/191	110/124	162/171	136/154	141/147	333/336	177/186
Taili 1	Shandong,China	185/203	118/118	171/171	136/158	141/141	342/345	180/183
Huafeng	Shandong,China	185/191	110/124	162/177	136/158	144/147	336/342	180/186
Huaguang	Shandong,China	185/191	118/124	165/171	136/158	141/147	336/339	177/177
Yanqing	Shandong,China	185/191	118/118	171/177	136/138	144/147	342/348	174/183
Heiyanqing	Shandong,China	185/191	118/124	165/171	132/136	141/141	339/351	177/177
Dongyuezaofeng	Shandong,China	185/191	124/124	165/180	136/140	141/144	342/348	174/174
Daiyuezaofeng	Shandong,China	185/191	110/124	165/171	136/136	141/141	342/342	174/174
Chuizhi 1	Shandong,China	185/185	118/121	171/171	136/136	141/141	336/342	180/180
Fuzhao	Shandong,China	185/191	118/118	171/183	140/154	141/147	330/330	183/192
Huangqianwuhua	Shandong,China	185/191	124/124	165/165	138/138	141/141	330/330	186/186
Laixiyouli	Shandong,China	185/191	124/124	165/165	136/138	141/141	336/348	177/180
Shilianzihuagai	Shandong,China	191/197	110/124	165/171	136/136	147/147	330/342	177/183
Dagongshu 1	Shandong,China	197/203	118/118	174/180	136/138	141/147	348/348	180/180
Dagongshu 4	Shandong,China	185/191	118/121	171/171	132/138	144/147	348/348	177/180
Dongfeng	Shandong,China	185/191	115/118	165/177	136/166	141/141	339/351	177/183
Chuizhi 2	Shandong,China	185/203	110/118	171/177	136/138	141/141	336/339	186/186
Nanganlin	Shandong,China	185/197	118/121	165/174	138/150	141/147	336/336	177/177
Yanquan	Shandong,China	185/191	118/118	171/177	138/150	141/147	339/351	174/183
Fulaidahongpao	Shandong,China	185/185	118/121	171/174	136/140	141/141	330/351	177/183
Dagongshu 2	Shandong,China	185/197	118/124	165/171	136/136	141/144	342/348	162/186
Taishankuili	Shandong,China	185/191	118/118	171/171	136/136	141/141	336/351	180/186
Hongli 3	Shandong,China	191/191	118/124	165/180	136/136	141/141	339/351	162/174
Chaoduanzhi 2	Shandong,China	185/185	118/124	171/171	136/146	141/141	339/339	165/165

Taishanduanzhi	Shandong,China	185/203	118/118	171/180	136/140	141/141	339/342	174/183
Haifeng	Shandong,China	185/197	118/118	165/165	138/138	141/144	330/330	180/183
Duanzhi 1	Shandong,China	185/191	118/121	165/171	134/136	141/147	330/339	177/180
Duanzhi 3	Shandong,China	185/185	124/124	162/177	134/136	141/141	336/336	174/183
Nanganlin 1	Shandong,China	185/191	118/121	171/171	134/140	141/147	330/351	180/180
Hongli 4	Shandong,China	185/191	118/118	171/171	136/140	141/141	336/342	180/186
Funingboke	Shandong,China	185/191	118/124	162/171	136/136	147/147	339/342	174/186
Culaiduanzhi	Shandong,China	185/191	118/118	165/180	138/138	141/141	336/336	177/177
Meifeng	Shandong,China	185/191	118/121	171/171	134/140	141/141	351/351	177/180
Chuizhi 3	Shandong,China	185/203	110/118	171/177	136/138	141/141	348/351	177/186
Yimengduanzhi	Shandong,China	185/185	118/124	171/171	136/146	144/147	336/348	183/183
Shandiandaban	Henan,China	185/191	118/118	171/171	136/140	141/147	348/348	180/186
Ziyouli	Henan,China	185/191	124/124	165/171	136/136	141/147	330/339	177/177
Hongyouli	Henan,China	185/191	121/121	165/171	136/136	141/147	342/351	177/177
Gaodian 1	Henan,China	185/191	121/121	171/171	138/138	144/147	348/351	180/183
Gaodian 10	Henan,China	185/191	118/118	171/171	136/140	141/141	333/333	180/186
Liuyuepao	Hubei,China	185/191	118/118	171/171	136/138	141/144	336/336	183/186
Guihuaxiang	Hubei,China	185/197	121/121	171/171	136/142	141/141	342/342	180/183
Meiguihong	Hubei,China	185/191	110/121	171/171	134/136	141/141	342/342	180/183
Luotianwukeli	Hubei,China	191/191	110/121	171/171	136/138	141/141	342/342	183/183
Bayuehong	Hubei,China	185/191	121/121	171/171	136/136	141/141	342/342	180/183
Shiyuehan	Hubei,China	191/191	118/118	171/171	138/142	141/141	333/351	177/183
Yangmaoli	Hubei,China	185/191	118/118	162/165	136/138	141/147	336/351	174/186
Bikouhong	Hubei,China	185/191	124/124	165/180	138/140	141/147	336/342	177/186
Luotianzaoli	Hubei,China	185/185	124/124	162/171	136/146	141/144	330/330	183/186

Zhongchili	Hubei,China	191/191	118/121	177/180	138/146	141/141	336/339	174/174
Qingmaozao	Hubei,China	185/191	121/121	165/180	138/140	141/141	339/348	177/186
Hongmaozao	Hubei,China	185/191	118/118	165/171	132/166	141/141	330/342	180/186
Jiuyuehan	Hubei,China	185/191	118/121	171/171	138/138	141/141	330/342	177/180
Dahongpao	Anhui,China	191/197	118/124	165/165	136/136	141/141	336/348	162/174
Chushuhong	Anhui,China	185/185	118/124	165/165	136/146	141/141	327/336	174/174
Mifengqiu	Anhui,China	185/185	124/124	162/180	136/136	141/141	339/342	174/186
Ningguodahongpao	Anhui,China	185/197	118/121	171/171	136/136	141/144	336/342	174/180
Shuchengdahongpao	Anhui,China	185/191	118/118	171/183	140/154	141/141	330/330	177/183
Yelicang	Anhui,China	185/191	118/118	171/171	136/138	141/147	336/342	180/183
Mao pu	Anhui,China	185/191	118/124	162/180	138/138	141/144	330/339	177/186
Yuanniandiban	Anhui,China	185/185	118/121	165/171	136/150	141/141	330/330	165/177
Shuanghehongpao	Anhui,China	185/191	118/124	165/165	136/136	141/141	336/339	162/174
Chongniandiban	Anhui,China	185/203	118/121	165/171	136/150	141/141	336/336	180/183
Jiujiazhong	Jiangsu,China	185/191	118/121	171/171	134/142	141/141	330/351	180/180
Jiaoza	Jiangsu,China	185/185	124/124	165/171	136/136	147/147	330/339	174/174
Songjiazao	Jiangsu,China	191/191	118/124	165/180	136/136	141/141	339/339	174/174
Gaoyuan 1	Jiangsu,China	185/197	121/124	171/177	144/144	141/141	330/351	177/183
Shuhedabao	Jiangsu,China	185/203	118/118	171/180	136/140	141/147	333/342	174/183
Chali	Jiangsu,China	185/191	118/118	171/171	136/150	147/147	339/348	183/183
Tielitou	Jiangsu,China	185/185	118/118	171/174	136/168	141/141	330/339	177/180
Dasongjiazao	Jiangsu,China	185/185	110/124	165/171	136/136	141/147	339/339	174/174
Duanza	Jiangsu,China	185/191	118/118	171/183	140/154	141/141	339/348	177/183
Chongyangpu	Jiangsu,China	191/197	118/121	171/171	136/140	141/141	345/345	174/180
Yixingdahongpao	Jiangsu,China	185/191	118/118	171/171	132/140	141/141	342/342	180/183

Jiandingyouli	Jiangsu,China	185/191	118/121	162/171	136/150	141/147	333/342	177/186
Timayanming	Jiangsu,China	185/191	124/124	171/180	136/136	144/147	330/336	174/183
Qingmaoruanci	Jiangsu,China	185/197	118/121	171/171	136/136	141/141	330/336	174/180
Yunxiang	Yunnan,China	185/191	118/118	171/171	136/136	141/144	336/342	180/186
Yunxiong	Yunnan,China	185/191	110/124	162/171	136/146	141/147	333/336	174/180
Yunhong	Yunnan,China	185/191	110/118	171/177	136/136	141/147	336/339	174/186
Yunliang	Yunnan,China	185/191	118/118	165/171	138/152	147/147	339/339	177/186
Guizhouchili	Guizhou,China	185/191	118/118	171/171	136/138	141/144	342/345	180/183
Wangmoxiaobanli	Guizhou,China	191/197	118/121	171/171	138/150	141/141	330/351	177/183
Hunanbaoyunzao	Hunan,China	185/185	118/121	171/171	140/140	141/147	339/342	174/177
Tali	Hunan,China	185/191	118/118	171/177	138/138	147/150	330/330	180/186
Shuangjili	Hunan,China	185/185	118/118	171/171	136/140	141/147	330/339	174/174
Jinpingchuili	Jiangxi,China	185/203	110/118	171/177	140/146	141/147	348/351	177/186
Guihua	Jiangxi,China	185/191	118/124	165/171	138/150	141/141	333/336	177/177
Guangxili	Guangxi,China	185/191	115/115	162/165	136/138	141/147	336/351	174/186
Guanxiyulin 1	Guangxi,China	185/185	124/124	162/165	136/136	141/141	339/348	174/186
Guangxiyouli	Guangxi,China	191/191	110/124	165/171	136/136	141/141	342/342	174/174
Guangdongaisheng	Guangdong,China	185/191	118/118	171/171	140/152	141/144	330/342	177/177
Xinnong 1	Guangdong,China	185/185	124/124	162/180	136/136	141/141	336/336	183/186
Xinkuili	Zejiang,China	185/191	118/121	171/171	138/138	141/147	330/336	180/180
Shanguang	Zejiang,China	185/197	118/121	171/171	138/138	141/147	339/351	174/174
Zhejiangkuili	Zejiang,China	185/197	118/121	171/171	138/150	141/141	342/351	177/180
Jiaozatima	Zejiang,China	185/191	118/121	171/183	140/140	141/141	330/351	177/183



Appendix F. The allele frequencies and sizes of seven core markers based on the allele data from 146 chestnut accessions

Appendix G. Pairwise groups Fst value

Cultivar groups	NWC	NC	MLY	SWC	SEC
NWC	0.000				
NC	0.031	0.000			
MLY	0.026	0.013	0.000		
SWC	0.051	0.030	0.025	0.000	
SEW	0.028	0.015	0.013	0.031	0.000

Appendix H. Mean allelic patterns across groups

Group	Na	Ne	I	He	uHe
NWC	4.278	3.048	1.208	0.638	0.696
NC	6.611	3.452	1.394	0.687	0.691
MLY	6.056	3.627	1.397	0.689	0.698
SWC	4.389	3.444	1.277	0.669	0.730
SEC	5.222	3.311	1.317	0.667	0.691
mean	5.311	3.377	1.319	0.670	0.701

Note: Na = No. of Different Alleles

Ne = No. of Effective Alleles = $1 / (\sum \pi_i^2)$

I = Shannon's Information Index = $-1 * \sum (\pi_i * \ln(\pi_i))$

He = Expected Heterozygosity = $1 - \sum \pi_i^2$

uHe = Unbiased Expected Heterozygosity = $(2N / (2N-1)) * He$

Appendix I. AMOVA analysis of five Chinese chestnut cultivar groups

Source	df	SS	MS	Variance component	Variance/%	P*
Among Pops	4	76.513	19.128	0.241	2%	<0.01
Within Pops	141	1953.987	13.858	13.858	98%	<0.01
Total	145	2030.500		14.099	100%	

Appendix J. 12 mandatory materials with special traits

Early-maturing type	Brachyplast type	Pendulous branch type	Male abortion type	Red bur type
Jingshuhong (7)	Duanzhi 1 (76)	Chuizhi 1 (58)	Wuhua (44)	Shandonghongli (42)
Yanshanzaofeng (18)	Chaoduanzhi 2 (73)	Chuizhi 2 (66)	Huangqianwuhua (60)	
	Chaoduanzhi 3 (77)	Chuizhi 3 (83)	Jinpingaichuili (136)	

Appendix K. 45 core collection selected based on non-group strategy

Number	Cultivar Name	Number	Cultivar Name	Number	Cultivar Name
1	Huijian	16	Jinfeng	31	Guihuaxiang
2	Mingjian	17	Wuhua	32	Bayuehong
3	Chunli	18	Huafeng	33	Bikouhong
4	Zhenbashuangjie	19	Huaguang	34	Jiuyuehan
5	Jingshuhong	20	Chuizhi 1	35	Dahongpao
6	Huafeng	21	Huangqianwuhua	36	Ningguodahongpao
7	Yanshanhongli	22	Dagongshu 1	37	Mao pu
8	Yanfeng	23	Chuizhi 2	38	Jiaoza
9	Yanshanzaofeng	24	Chaoduanzhi 2	39	Tielitou
10	Zundali	25	Duanzhi 1	40	Yixingdahongpao
11	Duanzhiyabian	26	Duanzhi 3	41	Jiandingyouli
12	Xiaoguan 10	27	Meifeng	42	Wangmoxiaobanli
13	Yankui	28	Chuizhi 3	43	Hunanbaoyunzao
14	Zunhuaduanci	29	Yimengduanzhi	44	Jinpingchuili
15	Shandonghongli	30	Ziyouli	45	Zhejiangkuili