Supplementary Data

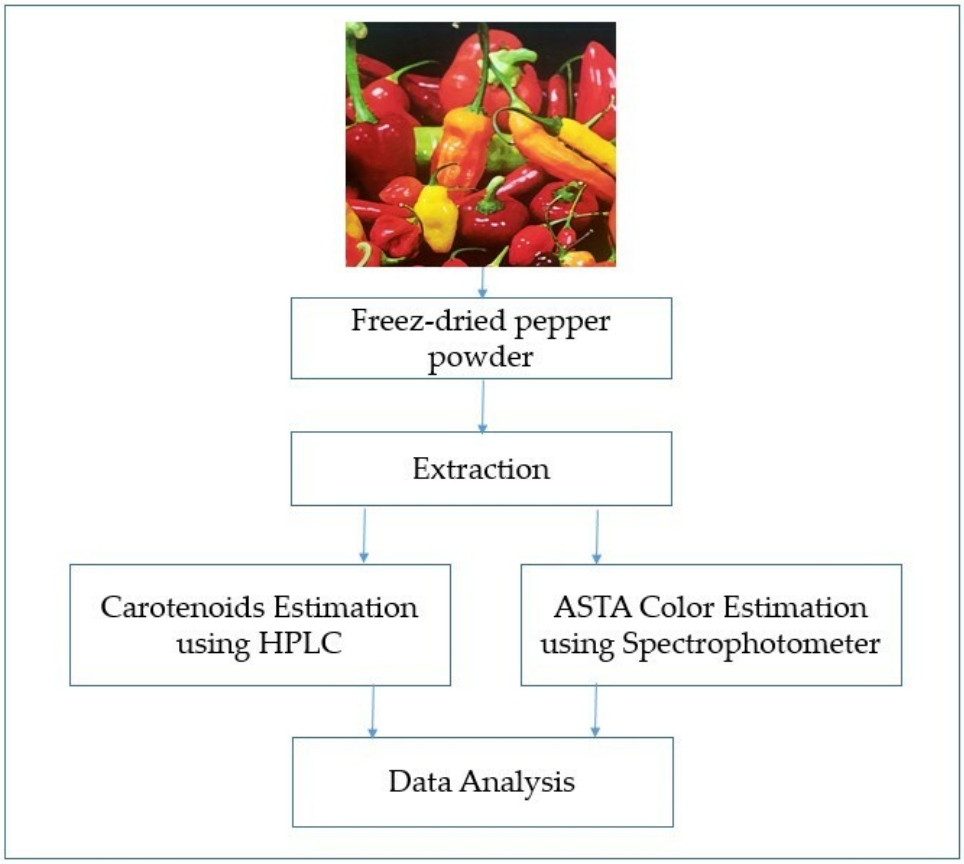

Figure S1. The graphical scheme of the study design

Table S1. The IT number, origins and fruit colors at maturity of 226 *Capsicum chinense* genetic resources.

ID	**IT Number**	Country Code	Country Full Name	Fruit Color at Ripening
1	158293	UNK	Unknown	1
8	158637	PER	Peru	2
9	158747	COL	Colombia	2
10	158787	RUS	Russia	2
11	158805	PER	Peru	5
16	183654	PER	Peru	2
17	183657	ESP	Spain	2
18	183659	PER	Peru	2
20	191654	PER	Peru	2
21	191655	MEX	Mexico	1
24	221687	USA	United States	2
26	228969	YEM	Yemen	2
27	228978	USA	United States	2
29	229191	HUN	Hungary	2
31	229193	HUN	Hungary	2
33	229195	HUN	Hungary	2
34	229196	HUN	Hungary	2
35	229197	HUN	Hungary	2
36	229198	HUN	Hungary	2
37	229199	HUN	Hungary	1
38	229200	HUN	Hungary	2
39	229201	HUN	Hungary	2
40	229202	HUN	Hungary	2
41	229203	HUN	Hungary	2
42	229204	HUN	Hungary	2
43	229205	HUN	Hungary	1
45	229207	HUN	Hungary	2
48	229210	HUN	Hungary	2
49	229211	HUN	Hungary	2
50	229212	HUN	Hungary	2
51	229213	HUN	Hungary	2
52	229214	HUN	Hungary	2
53	229215	HUN	Hungary	2
55	235725	GBR	United Kingdom	2
56	235726	PER	Peru	2
57	235732	USA	United States	5

59	236711	GBR	United Kingdom	2
61	236713	COL	Colombia	1
62	236714	COL	Colombia	2
64	236716	BOL	Bolivia	2
65	236717	BOL	Bolivia	2
66	236718	BOL	Bolivia	2
67	236719	ECU	Ecuador	5
68	236720	SUR	Suriname	2
69	236721	BRA	Brazil	2
70	236722	BRA	Brazil	1
71	236726	USA	United States	5
79	236736	ECU	Ecuador	5
80	236737	PER	Peru	2
81	236738	BOL	Bolivia	2
84	236741	VEN	Venezuela	2
85	236742	ECU	Ecuador	2
88	236745	SEN	Senegal	1
89	236746	UGA	Uganda	4
90	236747	BRA	Brazil	1
91	236748	TZA	Tanzania	2
92	236749	USA	United States	2
93	237728	CRI	Costa Rica	4
94	237729	PER	Peru	5
95	237730	CRI	Costa Rica	2
96	237731	CRI	Costa Rica	2
97	237732	HND	Honduras	2
98	237733	CRI	Costa Rica	1
99	237734	CRI	Costa Rica	2
100	237735	CRI	Costa Rica	2
103	242575	COL	Colombia	2
104	247198	BRA	Brazil	2
112	261197	CRI	Costa Rica	4
113	261199	PER	Peru	2
114	261200	CRI	Costa Rica	2
115	261201	PER	Peru	1
117	261203	BOL	Bolivia	4
119	261208	PER	Peru	3
120	261209	PER	Peru	5
121	261210	PER	Peru	3

122	261211	PER	Peru	5
123	261212	PER	Peru	5
124	261213	PER	Peru	5
125	261215	PER	Peru	5
126	261216	PER	Peru	4
127	261217	PER	Peru	2
128	261218	PER	Peru	4
129	261219	BRA	Brazil	2
130	261220	PER	Peru	2
131	261221	CRI	Costa Rica	5
132	261222	BRA	Brazil	2
133	261224	CRI	Costa Rica	2
136	261311	ECU	Ecuador	1
137	261313	ECU	Ecuador	2
138	261401	HUN	Hungary	2
141	261413	YEM	Yemen	2
142	261414	YEM	Yemen	2
143	261425	USA	United States	1
144	261426	UNK	Unknown	5
146	261432	BOL	Bolivia	3
147	261433	BOL	Bolivia	2
148	261434	BRA	Brazil	1
149	261436	PER	Peru	2
150	261442	BRA	Brazil	1
151	261444	BRA	Brazil	1
152	261445	BRA	Brazil	2
153	261446	BRA	Brazil	2
155	261448	BRA	Brazil	2
156	261449	BRA	Brazil	2
157	261450	BRA	Brazil	2
158	261451	BRA	Brazil	4
159	261452	BRA	Brazil	2
160	261453	BRA	Brazil	1
161	261454	MEX	Mexico	2
162	261456	PRI	Puerto Rico	2
163	261457	MEX	Mexico	2
164	261458	BOL	Bolivia	2
165	261459	PER	Peru	2
166	261460	PER	Peru	1

167	261461	BOL	Bolivia	4
168	261462	BOL	Bolivia	2
169	261463	PER	Peru	2
170	261464	ECU	Ecuador	2
171	261465	ECU	Ecuador	2
172	261466	ECU	Ecuador	2
173	261467	ECU	Ecuador	4
174	261468	COL	Colombia	4
175	261469	COL	Colombia	2
176	261470	COL	Colombia	4
177	261471	COL	Colombia	4
178	261472	COL	Colombia	2
180	261474	COL	Colombia	2
181	261475	COL	Colombia	1
182	261476	COL	Colombia	2
183	261477	CRI	Costa Rica	2
184	261478	BOL	Bolivia	2
190	261546	MEX	Mexico	2
191	261547	ECU	Ecuador	2
193	264108	COL	Colombia	1
195	264111	PER	Peru	2
197	264113	PER	Peru	4
198	264114	PER	Peru	2
200	264119	PER	Peru	5
201	264120	PER	Peru	5
203	264122	PER	Peru	5
204	264124	BRA	Brazil	2
211	270459	CRI	Costa Rica	2
212	270460	CRI	Costa Rica	2
213	270462	CUB	Cuba	2
216	270474	BRA	Brazil	2
217	270475	COL	Colombia	1
219	270477	COL	Colombia	2
220	270478	ECU	Ecuador	1
221	270479	BRA	Brazil	2
222	270487	USA	United States	5
223	270613	GTM	Guatemala	1
224	270625	ZMB	Zambia	2
226	270683	ESP	Spain	2

230	283497	NLD	Netherlands	2
231	283498	BOL	Bolivia	2
234	283952	CRI	Costa Rica	4
235	283954	BOL	Bolivia	2
236	283956	BRA	Brazil	2
237	283957	BRA	Brazil	1
239	283959	BRA	Brazil	4
240	283964	GRD	Grenada	2
241	284006	HUN	Hungary	5
242	284038	COL	Colombia	1
244	284040	CRI	Costa Rica	2
245	284041	CRI	Costa Rica	2
246	284042	CRI	Costa Rica	2
248	284044	CRI	Costa Rica	1
249	284045	CRI	Costa Rica	2
251	284047	CRI	Costa Rica	1
252	284048	CRI	Costa Rica	2
253	284049	CRI	Costa Rica	2
254	284050	CRI	Costa Rica	4
255	284051	CRI	Costa Rica	4
256	284052	CRI	Costa Rica	1
257	284054	BOL	Bolivia	2
258	284055	PER	Peru	1
261	284058	BOL	Bolivia	2
262	284059	PER	Peru	2
263	284060	PER	Peru	4
264	284061	PER	Peru	2
265	284062	PER	Peru	2
266	284063	PER	Peru	5
268	284065	BOL	Bolivia	2
269	284066	VEN	Venezuela	2
271	284068	COL	Colombia	4
272	284069	COL	Colombia	2
275	289005	CRI	Costa Rica	2
276	289015	PRI	Puerto Rico	2
279	289318	BRA	Brazil	2
280	289355	PER	Peru	2
281	289356	BOL	Bolivia	2
282	289357	PER	Peru	2

283	289358	BRA	Brazil	4
284	289359	BOL	Bolivia	2
285	289360	BRA	Brazil	2
286	291477	BRA	Brazil	2
287	291478	CRI	Costa Rica	5
291	293378	COL	Colombia	2
293	293395	MEX	Mexico	1
295	293674	USA	United States	2
298	305239	BOL	Bolivia	2
299	305240	BOL	Bolivia	1
303	305249	PER	Peru	4
304	305431	CRI	Costa Rica	4
305	305432	PRI	Puerto Rico	2
310	305437	COL	Colombia	2
313	305440	VEN	Venezuela	2
319	305447	BRA	Brazil	1
320	305448	GTM	Guatemala	2
322	305452	ECU	Ecuador	2
323	305455	COL	Colombia	1
324	305464	BRA	Brazil	2
328	305491	CRI	Costa Rica	1
329	305492	CRI	Costa Rica	2
330	305493	CRI	Costa Rica	5
331	305494	CRI	Costa Rica	2
334	305497	PER	Peru	2
335	305498	PER	Peru	2
337	305500	PER	Peru	4
339	305502	COL	Colombia	2
340	305503	PRI	Puerto Rico	1
341	305504	PRI	Puerto Rico	2
347	305510	BOL	Bolivia	1
348	305511	ECU	Ecuador	2
349	305512	CRI	Costa Rica	2
351	308759	HUN	Hungary	3

Note: Colors; 1: Orange, 2: Red, 3: Deep red, 4: Yellow, and 5: Brown

IT number: Introduction number

Table S2. The selected 51 pepper germplasms with total carotenoid content greater than 1000 mg/100 g DW.

ID	IT Number	Capsanthin	Capsorubin	Zeaxanthin	Antheraxanthin	Violaxanthin	α-Carotene	β-Carotene	β-Cryptoxanthin	Total carotenoid	ASTA Value
144	261426	1120.95	501.40	37.60	445.35	168.89	27.57	120.37	8.72	2430.85	221.318
17	183657	936.80	280.29	58.40	423.70	140.53	54.17	163.71	19.95	2077.55	196.308
124	261213	903.53	349.33	39.77	412.26	141.31	49.68	149.56	17.11	2062.54	211.724
141	261413	966.50	314.09	252.45	269.08	93.29	12.19	61.50	21.66	1990.76	160.474
330	305493	886.85	315.90	49.28	359.74	159.49	38.25	133.06	10.53	1953.10	193.52
52	229214	824.25	207.43	54.10	373.88	108.29	70.87	184.33	50.51	1873.67	198.276
138	261401	896.77	268.68	44.26	360.12	142.86	30.57	118.75	6.81	1868.82	190.978
113	261199	750.19	343.62	26.15	348.38	123.90	39.34	106.45	8.96	1746.98	168.838
120	261209	852.37	358.94	38.18	277.09	94.09	11.44	79.02	6.92	1718.07	150.716
163	261457	653.92	176.09	190.14	284.50	83.06	47.96	152.84	81.81	1670.32	158.834
131	261221	734.34	278.80	39.29	328.90	128.80	28.28	109.86	10.27	1658.54	144.402
49	229211	838.51	266.45	39.59	239.98	86.02	16.86	76.21	6.28	1569.90	143.992
100	237735	776.25	257.30	44.05	282.00	81.73	21.58	75.72	11.01	1549.64	138.088
94	237729	681.27	234.04	44.05	307.67	109.98	31.06	128.35	7.92	1544.33	128.74
67	236719	755.94	263.24	50.61	217.11	82.28	30.77	98.24	11.50	1509.69	156.374
351	308759	717.32	197.31	84.95	252.73	95.20	22.64	105.66	28.66	1504.47	167.69
122	261211	681.00	216.72	47.93	306.23	113.50	16.71	97.47	16.12	1495.68	148.584
282	289357	686.21	218.76	37.90	302.63	89.99	31.40	102.75	8.54	1478.19	130.79
265	284062	735.69	288.09	27.19	230.58	74.41	21.38	78.79	7.99	1464.11	131.364
8	158637	705.42	155.52	60.66	287.89	68.25	33.87	97.49	16.76	1425.87	139.646
201	264120	662.36	204.51	54.21	274.85	84.36	20.67	90.24	12.63	1403.82	139.974
71	236726	731.38	200.51	46.83	231.98	90.04	15.11	74.33	9.05	1399.23	146.452
45	229207	570.94	146.88	89.73	261.21	83.11	50.51	175.91	19.17	1397.45	148.338
157	261450	413.42	79.14	361.10	228.33	54.11	42.46	134.14	46.03	1358.74	151.618
266	284063	655.27	220.99	26.84	268.07	87.24	17.11	73.35	5.12	1353.99	123.574
16	183654	643.83	138.53	60.19	260.40	81.92	35.21	102.75	19.93	1342.75	128.904
222	270487	564.65	114.89	190.36	249.89	83.36	18.66	91.67	25.77	1339.26	96.432
35	229197	612.55	134.07	71.94	271.92	94.56	30.92	98.34	19.91	1334.20	159.572
125	261215	575.75	224.66	26.13	286.28	85.66	29.34	91.72	7.55	1327.09	127.428
24	221687	643.49	206.55	33.51	255.87	66.39	19.78	77.03	5.93	1308.55	127.756

142	261414	506.02	122.00	179.86	241.68	74.68	31.23	106.20	25.87	1287.54	129.314
103	242575	557.72	167.73	121.98	259.09	79.45	13.85	63.98	20.90	1284.70	120.704
95	237730	625.20	154.22	88.44	237.40	81.34	9.90	51.80	14.48	1262.77	132.594
195	264111	595.53	155.52	73.24	224.35	68.06	19.86	70.48	16.23	1223.28	130.38
53	229215	556.91	118.28	50.85	238.33	71.47	39.14	120.34	26.05	1221.37	120.13
40	229202	589.27	203.81	29.21	192.12	74.60	19.66	85.52	7.78	1201.97	139.482
114	261200	557.12	196.98	31.51	239.26	73.80	19.84	71.35	11.29	1201.15	119.064
246	284042	657.12	239.33	30.19	161.36	49.57	8.29	45.26	4.96	1196.08	96.842
39	229201	576.62	99.75	42.61	247.95	86.97	31.23	92.14	8.38	1185.66	121.278
241	284006	535.99	198.66	40.88	224.78	83.94	14.57	77.76	5.93	1182.50	121.032
127	261217	515.10	154.36	27.11	242.23	85.08	27.80	108.47	7.38	1167.53	130.954
26	228969	553.18	205.20	64.75	155.13	53.36	17.95	71.28	28.22	1149.08	83.558
203	264122	527.38	181.80	39.66	219.78	72.05	14.39	82.71	7.71	1145.48	120.13
287	291478	520.99	152.50	30.06	241.34	102.58	14.37	73.46	6.55	1141.85	107.584
172	261466	390.75	105.23	93.31	238.54	65.87	44.26	133.11	55.78	1126.86	98.892
38	229200	504.98	70.32	114.55	226.98	85.77	14.97	79.42	29.24	1126.23	149.978
183	261477	598.72	101.94	34.90	191.95	86.25	22.76	80.06	7.20	1123.77	124.148
36	229198	504.98	70.32	35.36	248.16	85.77	27.37	90.99	19.74	1082.69	113.98
88	236745	366.06	58.38	95.02	224.61	59.46	62.50	175.42	40.37	1081.83	127.428
169	261463	490.95	95.71	52.52	196.86	60.71	31.78	103.73	21.15	1053.42	96.022
56	235726	523.01	100.87	43.33	175.72	60.46	19.72	73.46	12.05	1008.63	101.188

Note: None of the 51 pepper germplasm contain Lutein.