

**Table S1** Cucumber materials used in the present study for genome-wide association and phylogenetic analysis at *SHORT HYPOCOTYL1 (Sh1)* locus

#	Accessions	Botanical variety	Geographic origin	Latitude	Longitude	Sh1 <sup>a</sup>	Groupings	Seed/data source	HL-UVB-free (cm) <sup>b</sup>	HL-LDUVB (cm) <sup>b</sup>
1	PI 183967	C. s. var. hardwickii (CSH)	India, Meghalaya	25.57	91.6	B	CSH-1	This study	14.5	14.4
2	CG0001	C. s. var. hardwickii (CSH)	India	24.8	93.2	B	CSH-2	Qi et al. 2013		
3	CG0010	C. s. var. hardwickii (CSH)	India	25.2	92.8	B	CSH-3	Qi et al. 2013		
4	CG0011	C. s. var. hardwickii (CSH)	India	25.8	91.3	B	CSH-4	Qi et al. 2013		
5	CG0015	C. s. var. hardwickii (CSH)	India	25.8	92.8	B	CSH-5	Qi et al. 2013		
6	CG0003	C. s. var. hardwickii (CSH)	India, Uttar Pradesh	26.85	80.4	A	CSH-6	Qi et al. 2013		
7	CG0004	C. s. var. hardwickii (CSH)	India	25.5	80.8	A	CSH-7	Qi et al. 2013		
8	PI 504564	C. s. var. hardwickii (CSH)	India	20.5	78.6	A	CSH-8	This study; Qi et al. 2013	41.8	18.8
9	CG0014	C. s. var. hardwickii (CSH)	India	26.2	81.3	A	CSH-9	Qi et al. 2013		
10	CG0016	C. s. var. hardwickii (CSH)	India	13.5	77.6	A	CSH-10	Qi et al. 2013		
11	CG0017	C. s. var. hardwickii (CSH)	India	12.2	77.4	A	CSH-11	Qi et al. 2013		
12	PI 214155	C. s. var. hardwickii (CSH)	India, Karnataka	15.19	75.42	B	CSH-12	This study; Qi et al. 2013	15.8	15.6
13	IC-248323	C. s. var. hardwickii (CSH)	India, Kankavalli Sindhurg Mah: 16.2	73.33	A			This study, PS		
14	IC-248339	C. s. var. hardwickii (CSH)	India, Sattichamad, Kohlapur M: 19.45	75.42	A			This study, PS	56.0	19.0
15	IC-256271	C. s. var. hardwickii (CSH)	India, Malappattam Kannur Keral 12	75.29	A			This study, PS		
16	IC-285515	C. s. var. hardwickii (CSH)	India, Malakkapara Trissur Keral: 10.16	76.51	A			This study, PS		
17	IC-336232	C. s. var. hardwickii (CSH)	India, Muryan Nilgris Tamil Nadu 11.07	78.39	A			This study, PS		
18	IC-336255	C. s. var. hardwickii (CSH)	India, Kattikulam Wayned Kerala 11.48	76.03	A			This study, PS		
19	IC-469509	C. s. var. hardwickii (CSH)	India, Kodagu Karnataka	12.2	75.48	A		This study, PS		
20	IC-469566	C. s. var. hardwickii (CSH)	India, Karnataka	15.19	75.42	A		This study, PS		
21	IHR-341A	C. s. var. hardwickii (CSH)	India, IHR Bangalore	13.09	77.31	A		This study, PS		
22	PI 462369	C. s. var. hardwickii (CSH)	India	20.35	78.57	A		This study		
23	Shimla	C. s. var. hardwickii (CSH)	India, Shimla, Himachal Pradesh 31.06	77.1	A			This study, TKB		
24	VRCHW-13-06	C. s. var. hardwickii (CSH)	India, Umiam Meghalaya	25.4	91.55	A		This study, PS		
25	IC-202060	C. s. var. hardwickii (CSH)	India, Mussorie, Uttarakhand	30.27	78.04	B		This study, TKB		
26	IC-248263	C. s. var. hardwickii (CSH)	India, Canacona North Goa Goa	15.3	73.58	B		This study, PS		
27	IC-248275	C. s. var. hardwickii (CSH)	India, Madgav Goa Goa	15.17	74.07	B		This study, PS		
28	IC-256188	C. s. var. hardwickii (CSH)	India, Manjapra Ernakulam Keral 9.58	76.17	B			This study, PS		
29	IC-285454	C. s. var. hardwickii (CSH)	India, Manjapra Ernakulam Keral 10.12	76.27	B			This study, PS		
30	IC-331444	C. s. var. hardwickii (CSH)	India, Jeyepore, Orissa	18.51	82.34	B		This study, TKB		
31	IC-331465	C. s. var. hardwickii (CSH)	India, Shehdol, Madhya Pradesh 23.18	81.21	B			This study, TKB		
32	IC-469591	C. s. var. hardwickii (CSH)	India, South Goa Goa	15.07	74.07	B		This study, PS		
33	PI 179678	C. s. var. hardwickii (CSH)	India, Rajasthan	26.55	93.5	B		This study	25.8	25.4
34	SEL1	C. s. var. hardwickii (CSH)	India, Selakui Uttarakhand	30.22	77.51	B		This study, TKB		
35	SUKC-11-1B	C. s. var. hardwickii (CSH)	India	15.6	74.3	B		This study, PS		
36	SUKC-11A	C. s. var. hardwickii (CSH)	India	11.2	75.8	B		This study, PS		
37	VRCHW-13-01	C. s. var. hardwickii (CSH)	India, Umiam Meghalaya	25.4	91.55	B		This study, PS		
38	VRCHW-13-04	C. s. var. hardwickii (CSH)	India, Agartala Tripura	23.49	91.17	B		This study, PS		
39	VRCHW-13-05	C. s. var. hardwickii (CSH)	India, Meghalaya	25.28	91.21	B		This study, PS		
40	IC-248151	C. s. var. hardwickii (CSH)	India, Telasherry Kannur Kerala	11.52	75.22	H		This study, PS		
41	IC-248349	C. s. var. hardwickii (CSH)	India, Tharale Sindhurg Mahaz 16.2	73.33	H			This study, PS		
42	IC-256248	C. s. var. hardwickii (CSH)	India, Kannavam Kannur Kerala	11.5	75.39	H		This study, PS		
43	IC-557158	C. s. var. hardwickii (CSH)	India, Jodhpur Rajsthan	26.14	73.01	H		This study, PS		
44	IHR-341B	C. s. var. hardwickii (CSH)	India, IHR Bangalore	13.07	77.29	H		This study, PS		
45	PI 215589	C. s. var. hardwickii (CSH)	India, Uttar Pradesh	26.5	79.9	H		This study	45.0	19.0
46	SUKC-11-2B	C. s. var. hardwickii (CSH)	India	26.51	73.02	H		This study, PS		
47	SUKC-11-C	C. s. var. hardwickii (CSH)	India	25.72	73.6	H		This study, PS		
48	SUKC-5	C. s. var. hardwickii (CSH)	India	24.9	73.1	H		This study, PS		
49	PI 605988	C. s. var. sativus (CSS)	India, Rajasthan	28.1	75.6	A	India-1	Qi et al. 2013		
50	PI 605991	C. s. var. sativus (CSS)	India, Rajasthan	26.6	73.9	A	India-2	Qi et al. 2013		
51	PI 606033	C. s. var. sativus (CSS)	India, Madhya Pradesh	22.58	78.39	B	India-3	This study		
52	PI 606039	C. s. var. sativus (CSS)	India, Madhya Pradesh	22.1	79.3	B	India-4	This study		
53	PI 605943	C. s. var. sativus (CSS)	India, Rajasthan	27.4	74.3	A	India-5	This study; Qi et al. 2013	61.0	35.0
54	PI 605957	C. s. var. sativus (CSS)	India, Rajasthan	26.5	73.4	B	India-6	This study		
55	CGN23002	C. s. var. sativus (CSS)	India	26	80	A	India-7	This study; Qi et al. 2013	46.6	13.4
56	PI 175120	C. s. var. sativus (CSS)	India, Khira	20.35	78.57	A	India-8	This study; Qi et al. 2013	45.0	25.0
57	PI 504570	C. s. var. sativus (CSS)	India	26	76	A	India-9	This study; Qi et al. 2013	21.6	11.8
58	PI 173892	C. s. var. sativus (CSS)	India, Uttar Pradesh	26.85	80.91	A	India-10	Qi et al. 2013		
59	CG7023	C. s. var. sativus (CSS)	Iran	35.45	51.3	B	Eurasian-01	Qi et al. 2013		
60	PI 482412	C. s. var. sativus (CSS)	Zimbabwe	-19.1	29.09	A	Eurasian-02	Qi et al. 2013		
61	PI 500361	C. s. var. sativus (CSS)	Zambia	-14.18	28.17	A	Eurasian-03	Qi et al. 2013		
62	PI 500359	C. s. var. sativus (CSS)	Zambia	-15.32	28.32	A	Eurasian-04	This study; Qi et al. 2013	35.2	15.5
63	PI 500365	C. s. var. sativus (CSS)	Zambia, Copperbelt	-12	28	A	Eurasian-05	This study; Qi et al. 2013	80.0	30.0
64	CGN20890	C. s. var. sativus (CSS)	Indonesia	-6.18	106.83	A	Eurasian-06	This study; Qi et al. 2013	94.0	20.0
65	CGN20517	C. s. var. sativus (CSS)	Sri Lanka	7	81	A	Eurasian-07	Qi et al. 2013		
66	PI 163213	C. s. var. sativus (CSS)	Pakistan, Punjab	31	72	A	Eurasian-08	This study; Qi et al. 2013	72.0	15.0
67	WI7156	C. s. var. sativus (CSS)	Europe	35.2	-115.3	A	Eurasian-09	This study	41.6	17.3
68	PI 330628	C. s. var. sativus (CSS)	Pakistan	33.66	73.16	A	Eurasian-10	This study		
69	PI 200815	C. s. var. sativus (CSS)	Myanmar, Mandalay	21.96	96.08	A	Eurasian-11	This study	35.6	14.4
70	CG5031	C. s. var. sativus (CSS)	Netherlands	52.32	5.55	A	Eurasian-12	Qi et al. 2013		
71	PI 288995	C. s. var. sativus (CSS)	Hungary	47.09	19.3	A	Eurasian-13	Qi et al. 2013		
72	PI 326594	C. s. var. sativus (CSS)	Hungary	47.2	19.5	A	Eurasian-14	Qi et al. 2013		
73	CG5278	C. s. var. sativus (CSS)	Netherlands	47.4	19.2	A	Eurasian-15	Qi et al. 2013		
74	CG5326	C. s. var. sativus (CSS)	Netherlands	48.1	19.3	A	Eurasian-16	Qi et al. 2013		
75	CG5420	C. s. var. sativus (CSS)	Poland	52.22	21.03	A	Eurasian-17	Qi et al. 2013		
76	CG5479	C. s. var. sativus (CSS)	Russian Federation	60	90	A	Eurasian-18	Qi et al. 2013		
77	PI 263047	C. s. var. sativus (CSS)	Russian Federation, Altay	59	89.5	A	Eurasian-19	This study; Qi et al. 2013	52.6	15.8
78	PI 512596	C. s. var. sativus (CSS)	Spain, Teruel	40.2	-1.6	A	Eurasian-20	Qi et al. 2013		
79	PI 338236	C. s. var. sativus (CSS)	Turkey, Kayseri	38.43	35.28	A	Eurasian-21	Qi et al. 2013		
80	CG5790	C. s. var. sativus (CSS)	?	38.2	35.1	A	Eurasian-22	Qi et al. 2013		
81	PI 172843	C. s. var. sativus (CSS)	Turkey, Mardin	37.18	40.44	A	Eurasian-23	Qi et al. 2013		
82	CG6508	C. s. var. sativus (CSS)	Puerto Rico	18.45	-66.1	A	Eurasian-24	Qi et al. 2013		
83	CGN19579	C. s. var. sativus (CSS)	USA	38.88	-77.02	A	Eurasian-25	Qi et al. 2013		
84	CGN19655	C. s. var. sativus (CSS)	USA	37.56	-80	A	Eurasian-26	Qi et al. 2013		
85	CGN19844	C. s. var. sativus (CSS)	USA	35.68	-100	A	Eurasian-27	Qi et al. 2013		
86	PI 234517	C. s. var. sativus (CSS)	USA	34	-81	A	Eurasian-28	This study; Qi et al. 2013	41.0	16.8
87	CGN21626	C. s. var. sativus (CSS)	USA	36.26	-102	A	Eurasian-29	Qi et al. 2013		
88	CGN21627	C. s. var. sativus (CSS)	USA	35.2	-110	A	Eurasian-30	Qi et al. 2013		
89	Marketmore 76	C. s. var. sativus (CSS)	USA	46.98	-88.66	A	Eurasian-31	This study	40.6	17.7
90	PI 221440	C. s. var. sativus (CSS)	Afghanistan, Paktia	33.42	69.22	A	Eurasian-32	Qi et al. 2013		
91	CG7086	C. s. var. sativus (CSS)	Iraq	32.46	51.4	A	Eurasian-33	Qi et al. 2013		
92	PI 181752	C. s. var. sativus (CSS)	Syria	34.48	38.59	A	Eurasian-34	Qi et al. 2013		

93	CGN21691	C. s. var. sativus (CSS)	Dem. Rep. of the Congo	-2.88	23.66	A	Eurasian-35	Qi et al. 2013		
94	W17204	C. s. var. sativus (CSS)	Europe	42	-110	A	Eurasian-36	This study		
95	TMG-1	C. s. var. sativus (CSS)	China, Taiwan	45	-120	A	Eurasian-37	This study	66.2	24.8
96	Straight 8	C. s. var. sativus (CSS)	USA	35.7	-102	A	Eurasian-38	This study	58.0	16.4
97	W17037A (P1)	C. s. var. sativus (CSS)	USA	42.54	-84.82	A	Eurasian-39	This study	34.8	17.3
98	W17354 (NP1)	C. s. var. sativus (CSS)	USA	42.54	-84.82	A	Eurasian-40	This study; Qi et al. 2013	45.6	23.2
99	H19	C. s. var. sativus (CSS)	USA	43.07	-89.4	A	Eurasian-41	This study	27.2	10.8
100	G421	C. s. var. sativus (CSS)	USA	45.202	-88.2	A	Eurasian-42	This study		
101	W17088D	C. s. var. sativus (CSS)	Pakistan	45	-120	A	Eurasian-43	This study		
102	W12757	C. s. var. sativus (CSS)	USA	43.10	-89.40	A	Eurasian-44	This study	20.4	13.0
103	Gy14	C. s. var. sativus (CSS)	USA	36.8	-100.6	A	Eurasian-45	This study		
104	CG5801	C. s. var. sativus (CSS)	China, Tianjin	39.13	117.18	A	Eurasian-46	Qi et al. 2013		
105	CG1292	C. s. var. sativus (CSS)	China, Hebei	38.04	114.5	A	Eurasian-47	Qi et al. 2013		
106	CG1031	C. s. var. sativus (CSS)	China, Beijing	39.92	116.39	A	Eurasian-48	Qi et al. 2013		
107	CG1043	C. s. var. sativus (CSS)	China, Jilin	43.87	126.55	A	Eurasian-49	Qi et al. 2013		
108	CG1071	C. s. var. sativus (CSS)	China, Jilin	43.9	125.2	A	Eurasian-50	This study; Qi et al. 2013	36.6	15.2
109	CG1077	C. s. var. sativus (CSS)	China, Jilin	43.88	126.4	A	Eurasian-51	Qi et al. 2013		
110	CG1083	C. s. var. sativus (CSS)	China, Jilin	43.89	126.3	A	Eurasian-52	Qi et al. 2013		
111	CG1149	C. s. var. sativus (CSS)	China, Neimengu	44	113	A	Eurasian-53	Qi et al. 2013		
112	CG1247	C. s. var. sativus (CSS)	China, Shanxi	37.87	112.56	A	Eurasian-54	Qi et al. 2013		
113	CG1322	C. s. var. sativus (CSS)	China, Hebei	38.87	115.47	A	Eurasian-55	Qi et al. 2013		
114	CG1373	C. s. var. sativus (CSS)	China, Hebei	37.73	115.7	A	Eurasian-56	Qi et al. 2013		
115	CG1541	C. s. var. sativus (CSS)	China, Liaoning	41.81	123.43	A	Eurasian-57	Qi et al. 2013		
116	CG1697	C. s. var. sativus (CSS)	China, Shandong	36.67	116.98	A	Eurasian-58	Qi et al. 2013		
117	CG1778	C. s. var. sativus (CSS)	?	36.8	118	A	Eurasian-59	Qi et al. 2013		
118	CG1811	C. s. var. sativus (CSS)	China, Shandong	36.2	117.08	A	Eurasian-60	Qi et al. 2013		
119	CG1876	C. s. var. sativus (CSS)	China	35	103	A	Eurasian-61	Qi et al. 2013		
120	CG3007	C. s. var. sativus (CSS)	Japan	35.68	139.77	A	Eurasian-62	Qi et al. 2013		
121	CG3010	C. s. var. sativus (CSS)	Japan	35.66	139.79	A	Eurasian-63	Qi et al. 2013		
122	CGN20854	C. s. var. sativus (CSS)	Japan	35.58	139.72	A	Eurasian-64	Qi et al. 2013		
123	PI 504563	C. s. var. sativus (CSS)	Japan, Tsuda	36.24	140.29	A	Eurasian-65	Qi et al. 2013		
124	PI 532523	C. s. var. sativus (CSS)	Japan	38.5	139.5	A	Eurasian-66	Qi et al. 2013		
125	PI 227210	C. s. var. sativus (CSS)	Japan, Honshu	36	138	A	Eurasian-67	Qi et al. 2013		
126	PI 267942	C. s. var. sativus (CSS)	Japan	33.22	129.53	A	Eurasian-68	Qi et al. 2013		
127	CG3127	C. s. var. sativus (CSS)	Japan	34.79	136.4	A	Eurasian-69	Qi et al. 2013		
128	CG4041	C. s. var. sativus (CSS)	China, Sichuan	30.13	102.93	A	Eurasian-70	Qi et al. 2013		
129	CG4081	C. s. var. sativus (CSS)	China, Guangdong	23.06	113.16	A	Eurasian-71	Qi et al. 2013		
130	CG4182	C. s. var. sativus (CSS)	China, Hunan	27.4	111.8	A	Eurasian-72	Qi et al. 2013		
131	CG4210	C. s. var. sativus (CSS)	China, Chongqing	29.56	106.57	A	Eurasian-73	Qi et al. 2013		
132	CC3	C. s. var. sativus (CSS)	China	39.92	116.39	A	Eurasian-74	This study	61.0	21.0
133	W17239	C. s. var. sativus (CSS)	China	34.16	108.04	A	Eurasian-75	This study		
134	W17238	C. s. var. sativus (CSS)	China	34.3	108.5	A	Eurasian-76	This study		
135	W17237	C. s. var. sativus (CSS)	China	32.23	119.24	A	Eurasian-77	This study		
136	W17123	C. s. var. sativus (CSS)	China	43.9	125.2	A	Eurasian-78	This study	40.6	19.5
137	PI 220791	C. s. var. sativus (CSS)	Afghanistan, Kabul	34.53	69.17	A		This study	69.4	25.4
138	PI 220171	C. s. var. sativus (CSS)	Afghanistan, Kandahar	31.62	65.72	A		This study		
139	PI 212599	C. s. var. sativus (CSS)	Afghanistan, Nangarhar	34.25	70.5	A		This study		
140	PI 246930	C. s. var. sativus (CSS)	Afghanistan, Nangarhar	34.1	70.37	A		This study		
141	PI 289698	C. s. var. sativus (CSS)	Australia	-35.31	149.12	A		This study		
142	PI 267745	C. s. var. sativus (CSS)	Brazil, Sao Paulo	-23.55	-46.63	A		This study	36.5	20.6
143	PI 229808	C. s. var. sativus (CSS)	Canada, Ontario	50	-85	A		This study	42.6	23.2
144	PI 306785	C. s. var. sativus (CSS)	Canada, Ontario	50	-85	A		This study	37.0	20.5
145	PI 451975	C. s. var. sativus (CSS)	Canada, Ontario	51.15	-85.19	A		This study		
146	9930	C. s. var. sativus (CSS)	China	39.9	116.42	A		This study	45.6	23.2
147	AM022	C. s. var. sativus (CSS)	China	39.92	116.56	A		This study	42.0	19.4
148	AM307	C. s. var. sativus (CSS)	China	-27.26	153.02	A		This study		
149	Beit Alpha	C. s. var. sativus (CSS)	China	51.58	5.16	A		This study	32.2	15.6
150	PI 418989	C. s. var. sativus (CSS)	China	42.5	110.5	A		This study		
151	PI 419017	C. s. var. sativus (CSS)	China	37.59	114.31	A		This study		
152	PI 432850	C. s. var. sativus (CSS)	China	38.04	114.48	A		This study	78.0	27.4
153	PI 432855	C. s. var. sativus (CSS)	China	38.89	115.47	A		This study		
154	PI 432858	C. s. var. sativus (CSS)	China	40.08	113.43	A		This study		
155	PI 432867	C. s. var. sativus (CSS)	China	41.8	123.4	A		This study	55.0	20.2
156	PI 432896	C. s. var. sativus (CSS)	China	35.51	104.11	A		This study		
157	PI 618915	C. s. var. sativus (CSS)	China	34.32	109.19	A		This study	31.2	19.0
158	W17325	C. s. var. sativus (CSS)	China	45.47	127.02	A		This study	36.6	14.8
159	W17432	C. s. var. sativus (CSS)	China	39.54	116.24	A		This study		
160	W17434	C. s. var. sativus (CSS)	China	39.8	116.8	A		This study		
161	W17437	C. s. var. sativus (CSS)	China	39.04	117.11	A		This study		
162	W17440	C. s. var. sativus (CSS)	China	27.45	68.1	A		This study		
163	PI 105340	C. s. var. sativus (CSS)	China, Beijing	39.92	116.41	A		This study	80.6	21.6
164	PI 618917	C. s. var. sativus (CSS)	China, Beijing	39.91	116.38	A		This study	21.6	11.8
165	PI 478367	C. s. var. sativus (CSS)	China, Gansu	38	102	A		This study	38.2	22.0
166	PI 257486	C. s. var. sativus (CSS)	China, Heilongjiang	47.28	125.26	A		This study	30.4	19.8
167	PI 257487	C. s. var. sativus (CSS)	China, Heilongjiang	48	129	A		This study	32.8	16.0
168	PI 267742	C. s. var. sativus (CSS)	China, Hong Kong	22.27	114.19	A		This study	62.4	15.2
169	PI 267743	C. s. var. sativus (CSS)	China, Hong Kong	22.26	114.18	A		This study	67.2	17.6
170	PI 618944	C. s. var. sativus (CSS)	China, Jiangsu	32.4	119.42	A		This study	51.4	23.4
171	PI 419009	C. s. var. sativus (CSS)	China, Lin-yang	38	105	A		This study		
172	PI 432882	C. s. var. sativus (CSS)	China, San dong si gua	36.66	116.98	A		This study	35.8	16.0
173	PI 432875	C. s. var. sativus (CSS)	China, San dong si gua 101	41.3	123.77	A		This study	30.0	15.2
174	PI 432877	C. s. var. sativus (CSS)	China, San dong si gua 507	37.73	115.7	A		This study	31.0	14.2
175	PI 432874	C. s. var. sativus (CSS)	China, San dong si gua 52	36.6	114.48	A		This study		
176	PI 432886	C. s. var. sativus (CSS)	China, San dong si gua 7156	40.22	116.21	A		This study	38.0	20.0
177	PI 418962	C. s. var. sativus (CSS)	China, Shaanxi	34.16	108.56	A		This study		
178	PI 418963	C. s. var. sativus (CSS)	China, Shaanxi	35.6	108.4	A		This study	27.6	16.4
179	PI 418964	C. s. var. sativus (CSS)	China, Shaanxi	35.9	107.9	A		This study		
180	PI 192940	C. s. var. sativus (CSS)	China, Shanghai	31.13	121.27	A		This study		
181	PI 432869	C. s. var. sativus (CSS)	China, Shanghai	31.22	121.55	A		This study	27.8	15.0
182	PI 432892	C. s. var. sativus (CSS)	China, Si Gua Qing 5896	39.33	115.87	A		This study	54.0	22.8
183	PI 321006	C. s. var. sativus (CSS)	China, Taiwan	23.5	121	A		This study	54.0	23.3
184	PI 321007	C. s. var. sativus (CSS)	China, Taiwan	23.48	120.89	A		This study	27.0	15.8
185	PI 321009	C. s. var. sativus (CSS)	China, Taiwan	23.52	121.23	A		This study	43.4	15.5

186	PI 321010	C. s. var. sativus (CSS)	China, Taiwan	23.41	120.57	A	This study		
187	PI 618937	C. s. var. sativus (CSS)	China, Tianjin	39.13	117.18	A	This study	33.8	18.8
188	PI 489754	C. s. var. sativus (CSS)	China, Wen shang	35.73	116.48	A	This study	23.2	16.4
189	PI 432870	C. s. var. sativus (CSS)	China, Ye er sau	36.08	111.52	A	This study	26.2	14.0
190	PI 283899	C. s. var. sativus (CSS)	Czech Republic	49.75	15.75	A	This study	28.8	15.0
191	PI 283902	C. s. var. sativus (CSS)	Czech Republic	49.49	15.28	A	This study		
192	PI 422184	C. s. var. sativus (CSS)	Czech Republic	49.3	15.4	A	This study	65.0	19.7
193	PI 342950	C. s. var. sativus (CSS)	Denmark	55.72	12.57	A	This study	65.5	21.4
194	PI 342951	C. s. var. sativus (CSS)	Denmark	56.15	9.3	A	This study		
195	PI 354952	C. s. var. sativus (CSS)	Denmark	55.7	13	A	This study	32.8	18.0
196	PI 183224	C. s. var. sativus (CSS)	Egypt	26	30	A	This study	45.0	20.0
197	PI 188749	C. s. var. sativus (CSS)	Egypt, Cairo	30.02	31.14	A	This study		
198	PI 296120	C. s. var. sativus (CSS)	Egypt, Cairo	30.05	31.23	A	This study	69.2	24.4
199	NZ1	C. s. var. sativus (CSS)	Europe	39.86	116.32	A	This study		
200	NZ1101	C. s. var. sativus (CSS)	Europe	51.75	5.6	A	This study	54.4	16.4
201	W17003	C. s. var. sativus (CSS)	Europe	32	34.8	A	This study	36.0	22.2
202	W17004	C. s. var. sativus (CSS)	Europe	31.8	35.23	A	This study	50.0	21.8
203	W17138	C. s. var. sativus (CSS)	Europe	41.97	13.14	A	This study	52.8	21.8
204	PI 351140	C. s. var. sativus (CSS)	Former Soviet Union	55.75	37.62	A	This study		
205	PI 435946	C. s. var. sativus (CSS)	Former Soviet Union	54.47	85.2	A	This study		
206	PI 435947	C. s. var. sativus (CSS)	Former Soviet Union	55.75	37.62	A	This study	48.6	16.4
207	PI 314425	C. s. var. sativus (CSS)	Georgia	32.96	-83.11	A	This study	46.2	20.2
208	PI 264666	C. s. var. sativus (CSS)	Germany	51.2	10.27	A	This study		
209	PI 264667	C. s. var. sativus (CSS)	Germany	53.2	11.5	A	This study		
210	PI 288996	C. s. var. sativus (CSS)	Hungary	47.43	19.25	A	This study	72.5	17.0
211	PI 531313	C. s. var. sativus (CSS)	Hungary	47.43	19.25	A	This study	31.6	22.6
212	CU124	C. s. var. sativus (CSS)	India	27.16	81.48	A	This study		
213	PI 271331	C. s. var. sativus (CSS)	India	18.9	72.72	A	This study	45.0	21.6
214	PI 197085	C. s. var. sativus (CSS)	India, Assam	26.14	91.77	A	This study	41.8	14.4
215	PI 197087	C. s. var. sativus (CSS)	India, Assam	26.15	91.78	A	This study		
216	Swarna Sheetal	C. s. var. sativus (CSS)	India, HARP, Ranchi Jharkhand	23.6	85.9	A	This study, PS		
217	PI 214049	C. s. var. sativus (CSS)	India, Karnataka	15.19	75.42	A	This study		
218	PI 605998	C. s. var. sativus (CSS)	India, Madhya Pradesh	22.58	78.39	A	This study		
219	PI 271327	C. s. var. sativus (CSS)	India, Maharashtra	18.95	72.81	A	This study	45.0	18.0
220	PCUC-09	C. s. var. sativus (CSS)	India, Pantnagar Udham Singhna	29.01	79.29	A	This study, PS		
221	PCUC-27	C. s. var. sativus (CSS)	India, Pantnagar Udham Singhna	29.05	79.65	A	This study, PS		
222	PI 605930	C. s. var. sativus (CSS)	India, Rajasthan	26.6	73.9	A	This study	24.6	17.2
223	PI 605933	C. s. var. sativus (CSS)	India, Rajasthan	26.5	73.8	A	This study	28.8	16.4
224	PI 605948	C. s. var. sativus (CSS)	India, Rajasthan	27.2	74.3	A	This study		
225	PI 605979	C. s. var. sativus (CSS)	India, Rajasthan	26.8	73.9	A	This study		
226	PI 605981	C. s. var. sativus (CSS)	India, Rajasthan	26.4	74.6	A	This study		
227	PI 173889	C. s. var. sativus (CSS)	India, Uttar Pradesh	26.85	80.91	A	This study	38.0	22.2
228	PI 137844	C. s. var. sativus (CSS)	Iran	38.25	48.29	A	This study	68.6	20.2
229	PI 211983	C. s. var. sativus (CSS)	Iran, East Azerbaijan	37.54	46.16	A	This study		
230	PI 211984	C. s. var. sativus (CSS)	Iran, East Azerbaijan	37.54	46.16	A	This study		
231	PI 222985	C. s. var. sativus (CSS)	Iran, East Azerbaijan	40.3	47.3	A	This study		
232	PI 137851	C. s. var. sativus (CSS)	Iran, Esfahan	33.49	48.36	A	This study	43.6	30.0
233	PI 344435	C. s. var. sativus (CSS)	Iran, Fars	29.06	53.02	A	This study		
234	PI 344434	C. s. var. sativus (CSS)	Iran, Mazandaran	36.13	52.31	A	This study		
235	PI 344442	C. s. var. sativus (CSS)	Iran, Tehran	35.7	51.42	A	This study	84.6	22.0
236	PI 344445	C. s. var. sativus (CSS)	Iran, Tehran	35.6	51.3	A	This study	66.4	12.0
237	PI 344438	C. s. var. sativus (CSS)	Iran, West Azerbaijan	37.55	45.07	A	This study	77.8	23.2
238	PI 137847	C. s. var. sativus (CSS)	Iran, Yazd	31.89	54.36	A	This study	83.0	30.5
239	PI 292012	C. s. var. sativus (CSS)	Israel	31	35	A	This study	54.5	18.8
240	PI 293923	C. s. var. sativus (CSS)	Israel	31.2	35.3	A	This study	36.3	18.2
241	PI 279464	C. s. var. sativus (CSS)	Japan	35.8	137.8	A	This study	64.8	13.8
242	PI 279465	C. s. var. sativus (CSS)	Japan	35.7	137.7	A	This study	53.0	13.6
243	PI 279466	C. s. var. sativus (CSS)	Japan	35.9	138	A	This study	38.4	15.0
244	PI 279469	C. s. var. sativus (CSS)	Japan	34.51	128.27	A	This study	27.2	19.6
245	PI 390240	C. s. var. sativus (CSS)	Japan	36.5	138.6	A	This study	43.2	12.8
246	PI 390243	C. s. var. sativus (CSS)	Japan	36.18	139.22	A	This study	41.4	16.8
247	PI 390244	C. s. var. sativus (CSS)	Japan	32.42	131.62	A	This study	33.6	11.3
248	PI 390245	C. s. var. sativus (CSS)	Japan	32.42	131.62	A	This study	47.7	35.3
249	PI 390247	C. s. var. sativus (CSS)	Japan	32.5	131.7	A	This study		
250	PI 390252	C. s. var. sativus (CSS)	Japan	36.12	138.15	A	This study		
251	PI 390255	C. s. var. sativus (CSS)	Japan	36.52	137.9	A	This study	41.0	16.0
252	PI 390257	C. s. var. sativus (CSS)	Japan	36.5	138.2	A	This study		
253	PI 390258	C. s. var. sativus (CSS)	Japan	36.48	137.7	A	This study	40.0	17.2
254	PI 390267	C. s. var. sativus (CSS)	Japan	35.87	139.65	A	This study	53.6	20.6
255	PI 432864	C. s. var. sativus (CSS)	Japan	34.69	135.5	A	This study	40.8	21.8
256	PI 432865	C. s. var. sativus (CSS)	Japan	35.6	139.6	A	This study	48.4	20.2
257	PI 532522	C. s. var. sativus (CSS)	Japan	36.12	138.15	A	This study		
258	Yomaki	C. s. var. sativus (CSS)	Japan	36.3	137.9	A	This study		
259	PI 212233	C. s. var. sativus (CSS)	Japan, Fukuoka	33.58	130.4	A	This study	63.6	20.4
260	PI 390264	C. s. var. sativus (CSS)	Japan, Kairyo-Shindome	35.39	139.45	A	This study	26.0	18.2
261	PI 390253	C. s. var. sativus (CSS)	Japan, Mogami - Japan	43.18	140.98	A	This study	45.0	18.4
262	PI 385967	C. s. var. sativus (CSS)	Kenya	-1.27	36.8	A	This study	47.6	20.4
263	PI 181755	C. s. var. sativus (CSS)	Lebanon	33.9	35.53	A	This study	71.3	22.2
264	PI 357830	C. s. var. sativus (CSS)	Macedonia	41.36	21.44	A	This study		
265	PI 357838	C. s. var. sativus (CSS)	Macedonia	41.36	21.44	A	This study		
266	PI 357863	C. s. var. sativus (CSS)	Macedonia	44.83	20.5	A	This study	46.0	23.0
267	PI 357864	C. s. var. sativus (CSS)	Macedonia	41.36	21.44	A	This study		
268	PI 357867	C. s. var. sativus (CSS)	Macedonia	44.6	20.76	A	This study	68.0	22.5
269	PI 368552	C. s. var. sativus (CSS)	Macedonia	41.25	21	A	This study		
270	PI 368553	C. s. var. sativus (CSS)	Macedonia	41.36	21.44	A	This study		
271	PI 368558	C. s. var. sativus (CSS)	Macedonia	44.5	20.6	A	This study		
272	PI 379282	C. s. var. sativus (CSS)	Macedonia	44.78	20.45	A	This study	60.8	28.4
273	PI 379285	C. s. var. sativus (CSS)	Macedonia	41.6	21.7	A	This study	24.5	15.0
274	PI 358813	C. s. var. sativus (CSS)	Malaysia, Kuala Lumpur	3.14	101.69	A	This study	59.2	14.2
275	PI 525075	C. s. var. sativus (CSS)	Mauritius	-20.2	57.5	A	This study	36.4	14.4
276	PI 263080	C. s. var. sativus (CSS)	Moldova	47	28.92	A	This study	45.0	17.6
277	PI 200818	C. s. var. sativus (CSS)	Myanmar, Mandalay	21.94	96.05	A	This study		
278	1334A3N	C. s. var. sativus (CSS)	Netherlands	30.42	35.45	A	This study	35.0	17.4

279	PI 255933	C. s. var. sativus (CSS)	Netherlands	52.32	5.55	A	This study	48.4	20.0
280	PI 277741	C. s. var. sativus (CSS)	Netherlands	52.22	4.52	A	This study	50.6	20.3
281	PI 356832	C. s. var. sativus (CSS)	Netherlands	52.3	5.5	A	This study	49.0	16.2
282	PI 360939	C. s. var. sativus (CSS)	Netherlands	52.07	5.17	A	This study		
283	PI 372905	C. s. var. sativus (CSS)	Netherlands	52.2	5.6	A	This study	34.5	15.5
284	PI 406473	C. s. var. sativus (CSS)	Netherlands	52.6	5.7	A	This study	30.4	12.2
285	PI 422180	C. s. var. sativus (CSS)	Netherlands	51.8	5.45	A	This study	34.0	16.2
286	PI 422182	C. s. var. sativus (CSS)	Netherlands	53	5.9	A	This study	44.6	18.0
287	PI 275410	C. s. var. sativus (CSS)	Netherlands, Gelderland	51.57	5.52	A	This study	31.8	22.8
288	PI 275411	C. s. var. sativus (CSS)	Netherlands, Gelderland	52.02	5.52	A	This study		
289	PI 135122	C. s. var. sativus (CSS)	NewZealand, Auckland Islands	-50.7	166.1	A	This study	39.0	13.2
290	PI 163223	C. s. var. sativus (CSS)	Pakistan, Punjab	33.1	73.26	A	This study	30.8	14.5
291	PI 426169	C. s. var. sativus (CSS)	Philippines, Luzon	16	121	A	This study	55.8	13.0
292	PI 426170	C. s. var. sativus (CSS)	Philippines, Luzon	16.5	121.5	A	This study	50.4	21.8
293	PI 285603	C. s. var. sativus (CSS)	Poland, Warszawa	52.13	21.1	A	This study		
294	PI 285605	C. s. var. sativus (CSS)	Poland, Warszawa	52.23	21.02	A	This study	33.5	17.2
295	PI 285606	C. s. var. sativus (CSS)	Poland, Warszawa	52.28	21.14	A	This study	33.8	14.7
296	PI 285608	C. s. var. sativus (CSS)	Poland, Warszawa	53.31	22	A	This study	35.3	15.5
297	PI 285610	C. s. var. sativus (CSS)	Poland, Warszawa	52.11	20.88	A	This study	50.6	17.6
298	PI 369717	C. s. var. sativus (CSS)	Poland, Warszawa	52.23	21.02	A	This study	41.2	20.4
299	PI 401732	C. s. var. sativus (CSS)	Puerto Rico	18.13	-66.35	A	This study		
300	PI 401734	C. s. var. sativus (CSS)	Puerto Rico	18.45	-66.1	A	This study	47.4	19.0
301	PI 466922	C. s. var. sativus (CSS)	Russian Federation	55.2	35.9	A	This study	40.4	13.0
302	PI 308915	C. s. var. sativus (CSS)	Russian Federation, Krasnodar	45.03	40.5	A	This study		
303	PI 308916	C. s. var. sativus (CSS)	Russian Federation, Krasnodar	45.01	38.58	A	This study		
304	PI 458845	C. s. var. sativus (CSS)	Russian Federation, Moscow	55.45	37.37	A	This study		
305	PI 458855	C. s. var. sativus (CSS)	Russian Federation, Moscow	54.3	36.4	A	This study	34.8	16.6
306	AM389	C. s. var. sativus (CSS)	South Korea	23.08	113.2	A	This study		
307	PI 508453	C. s. var. sativus (CSS)	South Korea, Incheon	37.48	126.63	A	This study	30.6	13.5
308	PI 508456	C. s. var. sativus (CSS)	South Korea, Incheon	37.4	126.6	A	This study	31.4	16.0
309	PI 483340	C. s. var. sativus (CSS)	South Korea, Seoul	37.56	126.9	A	This study	30.0	15.4
310	PI 483344	C. s. var. sativus (CSS)	South Korea, Seoul	37.57	126.98	A	This study	31.8	12.0
311	PI 261608	C. s. var. sativus (CSS)	Spain, Alava	42.84	-2.76	A	This study		
312	PI 257286	C. s. var. sativus (CSS)	Spain, Murcia	37.99	-1.13	A	This study	74.6	43.3
313	PI 205995	C. s. var. sativus (CSS)	Sweden	59.35	18.07	A	This study		
314	PI 205996	C. s. var. sativus (CSS)	Sweden	59.36	16.32	A	This study	38.8	23.2
315	PI 181874	C. s. var. sativus (CSS)	Syria	33.5	36.3	A	This study	65.0	29.2
316	PI 109483	C. s. var. sativus (CSS)	Turkey	38.57	35.14	A	This study		
317	PI 109484	C. s. var. sativus (CSS)	Turkey	39.92	32.83	A	This study	72.2	27.4
318	PI 175686	C. s. var. sativus (CSS)	Turkey	38.41	35.3	A	This study		
319	PI 176523	C. s. var. sativus (CSS)	Turkey, Afyon	38.76	30.54	A	This study	82.6	19.6
320	PI 169397	C. s. var. sativus (CSS)	Turkey, Bursa	40.18	29.05	A	This study	102.6	30.0
321	PI 169391	C. s. var. sativus (CSS)	Turkey, Canakkale	40.16	26.41	A	This study	79.0	24.0
322	PI 169393	C. s. var. sativus (CSS)	Turkey, Canakkale	40.15	26.4	A	This study	82.6	28.0
323	PI 178888	C. s. var. sativus (CSS)	Turkey, Cankiri	40.6	33.62	A	This study	39.3	16.5
324	PI 177361	C. s. var. sativus (CSS)	Turkey, Corum	40.33	34.57	A	This study	53.0	28.5
325	PI 169389	C. s. var. sativus (CSS)	Turkey, Edirne	41.4	26.33	A	This study		
326	PI 175697	C. s. var. sativus (CSS)	Turkey, Eskisehir	39.46	30.31	A	This study		
327	PI 171613	C. s. var. sativus (CSS)	Turkey, Gumushane	40.39	39.42	A	This study	90.0	29.0
328	PI 167223	C. s. var. sativus (CSS)	Turkey, Icel	36.63	33.62	A	This study	88.8	19.6
329	PI 175693	C. s. var. sativus (CSS)	Turkey, Kayseri	38.43	35.28	A	This study		
330	PI 176519	C. s. var. sativus (CSS)	Turkey, Kayseri	38.73	35.48	A	This study	114.2	17.8
331	PI 176953	C. s. var. sativus (CSS)	Turkey, Kayseri	38.43	35.28	A	This study		
332	PI 176954	C. s. var. sativus (CSS)	Turkey, Kayseri	38.73	35.48	A	This study	61.3	24.3
333	PI 204568	C. s. var. sativus (CSS)	Turkey, Kayseri	38.73	35.48	A	This study		
334	PI 175688	C. s. var. sativus (CSS)	Turkey, Kocaeli	40.77	29.92	A	This study	100.6	20.0
335	PI 174173	C. s. var. sativus (CSS)	Turkey, Maras	36.49	28.38	A	This study		
336	PI 175689	C. s. var. sativus (CSS)	Turkey, Nigde	37.97	34.68	A	This study		
337	PI 175679	C. s. var. sativus (CSS)	Turkey, Sinop	42.01	35.09	A	This study		
338	PI 171608	C. s. var. sativus (CSS)	Turkey, Tokat	40.31	36.55	A	This study	77.2	19.0
339	PI 206425	C. s. var. sativus (CSS)	Turkey, Trabzon	41.09	39.43	A	This study		
340	PI 174166	C. s. var. sativus (CSS)	Turkey, Urfa	37.16	38.79	A	This study	69.6	25.4
341	PI 174167	C. s. var. sativus (CSS)	Turkey, Urfa	37.1	38.47	A	This study		
342	PI 178884	C. s. var. sativus (CSS)	Turkey, Zonguldak	41.27	31.47	A	This study		
343	PI 414159	C. s. var. sativus (CSS)	UnitedStates, Hawaii	21.31	-157.79	A	This study	34.0	18.6
344	PI 209069	C. s. var. sativus (CSS)	UnitedStates, Ohio	40.5	-82.5	A	This study		
345	Addis	C. s. var. sativus (CSS)	USA	48.13	-95.38	A	This study		
346	AM218	C. s. var. sativus (CSS)	USA	45.54	-90.37	A	This study		
347	AM238	C. s. var. sativus (CSS)	USA	-35.28	149.15	A	This study	33.4	25.2
348	AM239	C. s. var. sativus (CSS)	USA	45.61	-94.09	A	This study	25.6	18.6
349	AM243	C. s. var. sativus (CSS)	USA	50.26	10.17	A	This study		
350	AM274	C. s. var. sativus (CSS)	USA	47.43	-98.51	A	This study		
351	AM277	C. s. var. sativus (CSS)	USA	43.10	-83.40	A	This study		
352	AM292	C. s. var. sativus (CSS)	USA	43.46	-89.17	A	This study		
353	AM397	C. s. var. sativus (CSS)	USA	35.14	136.59	A	This study		
354	Ames 26084	C. s. var. sativus (CSS)	USA	43.47	-88.47	A	This study		
355	Ashley	C. s. var. sativus (CSS)	USA	46.38	-94.42	A	This study		
356	Black Diamond	C. s. var. sativus (CSS)	USA	44.12	-89.12	A	This study	32.2	24.0
357	Boston Pickling	C. s. var. sativus (CSS)	USA	43.06	-89.19	A	This study	38.8	20.6
358	Bush Pickle	C. s. var. sativus (CSS)	USA	45.22	-94.35	A	This study		
359	Chipper	C. s. var. sativus (CSS)	USA	43.02	-87.56	A	This study		
360	Clinton	C. s. var. sativus (CSS)	USA	44.49	-91.66	A	This study	39.0	17.0
361	Cubit	C. s. var. sativus (CSS)	USA	47.20	-98.37	A	This study		
362	De Bourbonne	C. s. var. sativus (CSS)	USA	45.49	1.21	A	This study		
363	Delicatessen	C. s. var. sativus (CSS)	USA	43.38	-92.40	A	This study	35.0	18.3
364	Double Yield	C. s. var. sativus (CSS)	USA	44.57	-93.16	A	This study	40.0	23.0
365	DP1	C. s. var. sativus (CSS)	USA	52.33	5.58	A	This study		
366	Early Russian	C. s. var. sativus (CSS)	USA	54.41	83.16	A	This study	36.0	18.0
367	Empereur Alexander	C. s. var. sativus (CSS)	USA	27.30	80.50	A	This study	37.2	22.0
368	EOM-402-10	C. s. var. sativus (CSS)	USA	45.21	-92.29	A	This study		
369	Giant White	C. s. var. sativus (CSS)	USA	42.07	-97.17	A	This study		
370	Gyn1	C. s. var. sativus (CSS)	USA	44.47	-95.07	A	This study		
371	Hmong Red	C. s. var. sativus (CSS)	USA	44.08	-89.50	A	This study	50.8	20.6
372	Japanese Climbing	C. s. var. sativus (CSS)	USA	36.5	138.2	A	This study		
373	Jaune Dickfleischige	C. s. var. sativus (CSS)	USA	50.48	9.44	A	This study	53.6	20.8

374	Lafayette	C. s. var. sativus (CSS)	USA	43.01	-88.34	A	This study	25.0	17.3
375	Large Dutch Yellow	C. s. var. sativus (CSS)	USA	52.07	5.17	A	This study		
376	Marketer	C. s. var. sativus (CSS)	USA	43.42	-90.33	A	This study		
377	Marketmore 97	C. s. var. sativus (CSS)	USA	42.27	-76.28	A	This study		
378	Mincu Extra Early	C. s. var. sativus (CSS)	USA	42.16	-92.39	A	This study	25.4	19.4
379	Minnesota Dwarf	C. s. var. sativus (CSS)	USA	45.70	-93.69	A	This study		
380	Model	C. s. var. sativus (CSS)	USA	42.40	-88.57	A	This study	32.0	17.5
381	MSU 713-5	C. s. var. sativus (CSS)	USA	43.27	89.15	A	This study		
382	National Pickling	C. s. var. sativus (CSS)	USA	42.39	-84.25	A	This study		
383	NC4406	C. s. var. sativus (CSS)	USA	33.18	-81.52	A	This study	42.4	20.4
384	NC46	C. s. var. sativus (CSS)	USA	35.01	-78.58	A	This study	39.2	20.6
385	NC76	C. s. var. sativus (CSS)	USA	35.51	-78.38	A	This study	72.0	19.7
386	Northern Pickling	C. s. var. sativus (CSS)	USA	43.22	-84.49	A	This study		
387	Ohio MR 17	C. s. var. sativus (CSS)	USA	35.52	138.44	A	This study		
388	P 51 DMR	C. s. var. sativus (CSS)	USA	43.48	-91.57	A	This study		
389	Parisian Pickling	C. s. var. sativus (CSS)	USA	44.07	-96.00	A	This study	40.4	28.0
390	Pepino	C. s. var. sativus (CSS)	USA	45.40	-89.46	A	This study		
391	Pershing	C. s. var. sativus (CSS)	USA	43.05	-89.56	A	This study		
392	Pixie	C. s. var. sativus (CSS)	USA	44.18	-85.36	A	This study		
393	Poinsett 76	C. s. var. sativus (CSS)	USA	44.28	-96.35	A	This study	42.4	17.2
394	Poinsett 88	C. s. var. sativus (CSS)	USA	33.97	-81.05	A	This study	46.0	20.4
395	Puerto Rico 10	C. s. var. sativus (CSS)	USA	18.12	-66.37	A	This study	31.0	18.4
396	SMR 18	C. s. var. sativus (CSS)	USA	44.89	-85.03	A	This study	30.2	18.4
397	Solly Beiler	C. s. var. sativus (CSS)	USA	40.02	-76.1	A	This study		
398	Spacemaster 80	C. s. var. sativus (CSS)	USA	47.42	-102.45	A	This study	24.4	17.3
399	Sumter	C. s. var. sativus (CSS)	USA	41.22	-79.15	A	This study		
400	Suyo Long	C. s. var. sativus (CSS)	USA	43.20	-83.90	A	This study		
401	Tablegreen	C. s. var. sativus (CSS)	USA	47.16	-98.30	A	This study		
402	Tablegreen 66	C. s. var. sativus (CSS)	USA	43.08	-74.59	A	This study	60.0	18.6
403	TAMU 950	C. s. var. sativus (CSS)	USA	31.47	35.13	A	This study		
404	Telegraph Improved	C. s. var. sativus (CSS)	USA	35.39	138.43	A	This study	51.0	18.8
405	Tendergreen	C. s. var. sativus (CSS)	USA	40.56	-86.19	A	This study		
406	Thai Mae Sai	C. s. var. sativus (CSS)	USA	19.54	99.5	A	This study		
407	Tiny Dill	C. s. var. sativus (CSS)	USA	42.96	-84.55	A	This study	22.6	13.7
408	Vlaspiik	C. s. var. sativus (CSS)	USA	42.59	-89.32	A	This study		
409	Wainwright	C. s. var. sativus (CSS)	USA	43.01	-89.27	A	This study	36.2	15.2
410	Wautoma	C. s. var. sativus (CSS)	USA	44.04	-89.17	A	This study		
411	White Wonder	C. s. var. sativus (CSS)	USA	44.19	94.57	A	This study	59.6	20.2
412	W11983H	C. s. var. sativus (CSS)	USA	43.09	-89.27	A	This study	35.3	14.0
413	W15551	C. s. var. sativus (CSS)	USA	43.10	-89.12	A	This study	27.8	22.4
414	W17010	C. s. var. sativus (CSS)	USA	44.30	-94.14	A	This study	32.8	16.8
415	W17104	C. s. var. sativus (CSS)	USA	43.30	-89.10	A	This study		
416	W17105	C. s. var. sativus (CSS)	USA	39.4	114.2	A	This study	55.6	19.6
417	W17155	C. s. var. sativus (CSS)	USA	32.5	34.48	A	This study	42.0	21.0
418	W17232	C. s. var. sativus (CSS)	USA	45.03	-102.59	A	This study		
419	W17284	C. s. var. sativus (CSS)	USA	43.04	-89.24	A	This study		
420	W17285	C. s. var. sativus (CSS)	USA	31.6	35.14	A	This study	57.5	17.8
421	W17286	C. s. var. sativus (CSS)	USA	32.3	35.5	A	This study	42.0	22.6
422	W17324	C. s. var. sativus (CSS)	USA	43.05	-89.25	A	This study	47.6	22.4
423	W17383	C. s. var. sativus (CSS)	USA	43.06	-89.3	A	This study		
424	W17391	C. s. var. sativus (CSS)	USA	43.01	-73.22	A	This study		
425	W17433	C. s. var. sativus (CSS)	USA	42.25	-85.55	A	This study		
426	Yellow Submarine	C. s. var. sativus (CSS)	USA	41.25	-73.4	A	This study		
427	AM242	C. s. var. sativus (CSS)	Uzbekistan	14.54	99.50	A	This study	29.0	20.2
428	PI 390953	C. s. var. sativus (CSS)	Uzbekistan	41.22	64.35	A	This study		
429	PI 502331	C. s. var. sativus (CSS)	Uzbekistan, Samarqand	39.7	66.98	A	This study	39.4	15.7
430	PI 500360	C. s. var. sativus (CSS)	Zambia	-14.18	28.17	A	This study		
431	PI 482463	C. s. var. sativus (CSS)	Zimbabwe	-19.01	29.09	A	This study		
432	PI 482464	C. s. var. sativus (CSS)	Zimbabwe	-17.83	31.05	A	This study	35.6	21.4
433	PI 481614	C. s. var. sativus (CSS)	Bhutan	27.3	90.2	B	This study	25.2	22.4
434	PI 481617	C. s. var. sativus (CSS)	Bhutan	28	90.7	B	This study	24.8	22.4
435	PI 356809	C. s. var. sativus (CSS)	Former Soviet Union	55.7	37.6	B	This study	24.0	21.8
436	PI 197088	C. s. var. sativus (CSS)	India, Assam	25.9	91.75	B	This study		
437	Swarna Ageti	C. s. var. sativus (CSS)	India, HARP, Ranchi Jharkhand	23.2	85.18	B	This study, PS		
438	PI 164743	C. s. var. sativus (CSS)	India, Karnataka	15.19	75.42	B	This study		
439	PI 370019	C. s. var. sativus (CSS)	India, Kerala	8.51	76.97	B	This study	27.6	23.6
440	CG8160	C. s. var. sativus (CSS)	India, Madhya Pradesh	23.25	77.42	B	Qi et al. 2013		
441	CG8163	C. s. var. sativus (CSS)	India, Madhya Pradesh	23.3	77.52	B	Qi et al. 2013		
442	PI 605996	C. s. var. sativus (CSS)	India, Madhya Pradesh	23.25	77.41	B	This study	24.2	20.6
443	PI 267746	C. s. var. sativus (CSS)	India, Maharashtra	18.96	72.82	B	This study	25.2	23.2
444	CG8198	C. s. var. sativus (CSS)	India, Rajasthan	26.57	73.84	B	Qi et al. 2013		
445	PI 164465	C. s. var. sativus (CSS)	India, Rajasthan	33	73.2	B	This study		
446	PI 605945	C. s. var. sativus (CSS)	India, Rajasthan	27.01	74.13	B	This study		
447	PI 605947	C. s. var. sativus (CSS)	India, Rajasthan	26.9	74	B	This study		
448	PI 470254	C. s. var. sativus (CSS)	Indonesia, Kalimantan	-6.17	106.83	B	This study		
449	Ames 22385	C. s. var. sativus (CSS)	Nepal	28.23	84.07	B	This study		
450	PI 163216	C. s. var. sativus (CSS)	Pakistan, Punjab	31	72	B	This study	32.4	29.5
451	PI 163217	C. s. var. sativus (CSS)	Pakistan, Punjab	27.43	68.09	B	This study	28.6	25.0
452	PI 285607	C. s. var. sativus (CSS)	Poland, Warszawa	53.12	20.96	B	This study	30.4	28.0
453	PI 370643	C. s. var. sativus (CSS)	Russian Federation, Krasnodar	46.3	38.2	B	This study		
454	PI 263079	C. s. var. sativus (CSS)	Russian Federation, Voronezh	61.5	90.1	B	This study	25.4	23.0
455	Brown Russian	C. s. var. sativus (CSS)	USA	61.41	104.04	B	This study		
456	White Emerald	C. s. var. sativus (CSS)	USA	18.17	100.13	B	This study	22.2	20.6
457	PI 197086	C. s. var. sativus (CSS)	India, Assam	26.13	91.3	H	This study	32.2	25.8
458	PI 164679	C. s. var. sativus (CSS)	India, Karnataka	12.97	77.56	H	This study	59.2	14.0
459	PI 606013	C. s. var. sativus (CSS)	India, Madhya Pradesh	22.3	78.6	H	This study		
460	PI 271328	C. s. var. sativus (CSS)	India, Maharashtra	18.92	73.32	H	This study		
461	PI 179676	C. s. var. sativus (CSS)	India, Rajasthan	26.57	74.1	H	This study	64.0	20.2
462	PI 466921	C. s. var. sativus (CSS)	Russian Federation	56.8	35.4	H	This study		
463	PI 249562	C. s. var. sativus (CSS)	Thailand	13.5	99.7	H	This study		
464	Ivory Queen	C. s. var. sativus (CSS)	USA	44.13	-93.52	H	This study		
465	Modern Early	C. s. var. sativus (CSS)	USA	43.26	-89.56	H	This study		
466	Thai Petch Tsai	C. s. var. sativus (CSS)	USA	16.59	99.44	H	This study	42.0	17.6

467	PJ 500366	C. s. var. sativus (CSS)	Zambia, Copperbelt	-13.3	27.32	H		This study		
468	SWCC8	C. s. var. xishuangbannensis (XIS)	China, Yunnan	21.24	101.35	B	XIS-1	This study		
469	WI7167	C. s. var. xishuangbannensis (XIS)	China, Yunnan	21.45	101.38	B	XIS-2	This study	20.0	19.0
470	CG9142	C. s. var. xishuangbannensis (XIS)	China, Yunnan	21.47	101.58	B	XIS-3	Qi et al. 2013		
471	CG9143	C. s. var. xishuangbannensis (XIS)	China, Yunnan	21.98	100.82	B	XIS-4	Qi et al. 2013		
472	CG9146	C. s. var. xishuangbannensis (XIS)	China, Yunnan	21.96	100.45	B	XIS-5	Qi et al. 2013		
473	CG9153	C. s. var. xishuangbannensis (XIS)	China, Yunnan	21.75	100.05	B	XIS-6	Qi et al. 2013		
474	CG9160	C. s. var. xishuangbannensis (XIS)	China, Yunnan	21.84	100.38	B	XIS-7	Qi et al. 2013		
475	CG9164	C. s. var. xishuangbannensis (XIS)	China, Yunnan	21.98	100.26	B	XIS-8	Qi et al. 2013		
476	CG9169	C. s. var. xishuangbannensis (XIS)	China, Yunnan	22.17	100.13	B	XIS-9	Qi et al. 2013		
477	CG9174	C. s. var. xishuangbannensis (XIS)	China, Yunnan	22.18	100.33	B	XIS-10	Qi et al. 2013		
478	CG9185	C. s. var. xishuangbannensis (XIS)	China, Yunnan	22.05	100.56	B	XIS-11	Qi et al. 2013		
479	CG9187	C. s. var. xishuangbannensis (XIS)	China, Yunnan	22.38	100.47	B	XIS-12	Qi et al. 2013		
480	CG9191	C. s. var. xishuangbannensis (XIS)	China, Yunnan	21.86	100.57	B	XIS-13	Qi et al. 2013		
481	CG9192	C. s. var. xishuangbannensis (XIS)	China, Yunnan	21.58	100.42	B	XIS-14	Qi et al. 2013		
482	CG9197	C. s. var. xishuangbannensis (XIS)	China, Yunnan	21.93	100.16	B	XIS-15	Qi et al. 2013		
483	CG9198	C. s. var. xishuangbannensis (XIS)	China, Yunnan	21.2	101.3	B	XIS-16	Qi et al. 2013		
484	CG9199	C. s. var. xishuangbannensis (XIS)	China, Yunnan	22.8	101.8	B	XIS-17	Qi et al. 2013		
485	CG9201	C. s. var. xishuangbannensis (XIS)	China, Yunnan	22.1	100.7	B	XIS-18	Qi et al. 2013		
486	CG9203	C. s. var. xishuangbannensis (XIS)	China, Yunnan	21.55	101.26	B	XIS-19	Qi et al. 2013		
487	CG9165	C. s. var. xishuangbannensis (XIS)	China, Yunnan	21.8	101.2	B	XIS-20	Qi et al. 2013		
488	XIS3-1	C. s. var. xishuangbannensis (XIS)	China, Yunnan	21.5	100.2	B		This study-CW		
489	XIS3-4	C. s. var. xishuangbannensis (XIS)	China, Yunnan	21.5	100.2	H		This study-CW		
490	XIS4-1	C. s. var. xishuangbannensis (XIS)	China, Yunnan	21.5	100.2	B		This study-CW		
491	XIS5-1	C. s. var. xishuangbannensis (XIS)	China, Yunnan	21.5	100.2	B		This study-CW		
492	XIS14-1	C. s. var. xishuangbannensis (XIS)	China, Yunnan	21.5	100.2	B		This study-CW		
493	XIS23	C. s. var. xishuangbannensis (XIS)	China, Yunnan	21.5	100.2	B		This study-CW		
494	XIS24	C. s. var. xishuangbannensis (XIS)	China, Yunnan	21.5	100.2	B		This study-CW		
495	XIS25	C. s. var. xishuangbannensis (XIS)	China, Yunnan	21.5	100.2	B		This study-CW		
496	XIS26	C. s. var. xishuangbannensis (XIS)	China, Yunnan	21.5	100.2	H		This study-CW		
497	XIS27	C. s. var. xishuangbannensis (XIS)	China, Yunnan	21.5	100.2	B		This study-CW		
498	XIS28	C. s. var. xishuangbannensis (XIS)	China, Yunnan	21.5	100.2	B		This study-CW		
499	XIS29	C. s. var. xishuangbannensis (XIS)	China, Yunnan	21.5	100.2	B		This study-CW		
500	XIS30	C. s. var. xishuangbannensis (XIS)	China, Yunnan	21.5	100.2	B		This study-CW		
501	XIS31	C. s. var. xishuangbannensis (XIS)	China, Yunnan	21.5	100.2	B		This study-CW		
502	XIS33	C. s. var. xishuangbannensis (XIS)	China, Yunnan	21.5	100.2	B		This study-CW		
503	HYSTH1	C. hystrix	China, Yunnan	21.5	100.2	A		This study-CW		
504	HYS1-1	C. hystrix	China, Yunnan	21.5	100.2	A		This study-CW		
505	HYS2-1	C. hystrix	China, Yunnan	21.5	100.2	A		This study-CW		
506	HYS6-1	C. hystrix	China, Yunnan	21.5	100.2	A		This study-CW		
507	HYS9-1	C. hystrix	China, Yunnan	21.5	100.2	A		This study-CW		
508	HYS11-1	C. hystrix	China, Yunnan	21.5	100.2	A		This study-CW		
509	HYS12-1	C. hystrix	China, Yunnan	21.5	100.2	A		This study-CW		
510	HYS15-1	C. hystrix	China, Yunnan	21.5	100.2	A		This study-CW		
511	HYS16-1	C. hystrix	China, Yunnan	21.5	100.2	A		This study-CW		

<sup>a</sup> Alleles of the *Sh1* locus genotyped with dCAPS-51 SNP: A from CC3 (LDUVB sensitive), B from SWCC8 (LDUVB insensitive)

<sup>b</sup> Hypocotyl length (in centimeters) of 211 lines measured at UVB-free and LDUVB condition. Data were collected 10d after germination in each environment.







**Table S3.** Information of primers used in genetic mapping, gene expression and yeast two-hybrid assay.

Marker/primer	Uses	Left primer (5' to 3')	Right primer (5' to 3')	Enzyme	Corresponding Arabidopsis genes
SSR03409	Mapping	AAGACGTGACAACCAACTGAA	TGACTGGGACAATTGTAGACTCC		
dCAPS-59	Mapping	ACGATTAGACTAGAGATTGT	AGCAACCCAAATGTTTTTC	RsaI	
dCAPS-51	Mapping	ATACTTACTCATCACAGGTA	TTCCCTCTTTGTGCGTACTT	RsaI	
dCAPS-68	Mapping	ACAAAACGGGCATTTAAGGA	AAACAAGTGGTGATCAATAC	Maell	
Indel-22	Mapping	TTGGAATTTAGTAAAAGAAATTTTGA	TAACTCAGACCCCTCATGC		
SSR31430	Mapping	CGATTTTCAAACGACATTG	TAATTGGGCCTGATCCATTC		
Sh1-1	cDNA cloning	TCCGGAATACCCAAAAGTTC	GTAGCTCCAGCTTCCATGT		
Sh1-2	cDNA cloning	TGGAGTGGGCAAAATGTGT	CCAGTAAGACACCAGCGACA		
Sh1-3	cDNA cloning	CCCCGAGGTGCTATTAGGAT	CAACCCACCAGCTTTTAGA		
Sh1-4	cDNA cloning	TCGAAGATGTTGTCGAGTGC	TTTTACAGAGAGGCCCATCG		
β-actin	qPCR, reference gene	ATTGTTCTCAGTGGTGGTCTAC	CCTTTGAGATCCACATCTGCT		
gene1	qPCR	TCACCTTCGTCTTGTGGGAA	CACAGGCACAAGGGGTTAG		
gene2 (Sh1)	qPCR	ATCCATGCTGGTCAGCCTAC	CTTGCCATCTGTGTGCAGT		
gene3	qPCR	TCCTTTGAAATGGTGCACAA	CGTTGACCTTTCTCCTGCC		
gene4	qPCR	CCAACCAAGTCCCAAGAGA	ACATCATATGCCCTCTCCCG		
CsUVR8	qPCR, UV responsive genes	TGGATGGAGGCACACTAG	TTCCGATCAACTGACTCCCC		AT5G63860
CsCOP1	qPCR, UV responsive genes	GTGGCATAGGTTCCGGTTCAC	AGGACTGCACTCTCCAGC		AT2G32950
CsHY5	qPCR, UV responsive genes	GGAAATGGAGAGCGATGAGGA	GACCTCCCGAGAAACTTGA		AT5G11260
CsCHS	qPCR, UV responsive genes	CGTTGTTGGAGATGGTGCA	TTCCCTCAAATGTCCGTCGA		AT5G13930
CsEXP2	qPCR, Cell elongation genes	TTCGAAAACAGGGTGGCAAG	GCTGGTGGTGACTTGGAAAG		At5g05290
CsDWF4	qPCR, Cell elongation genes	ATCTTCTTCTCCGGCAG	CACGACGTTTTCCAAAGCGAA		At3g50660
CsEXT3	qPCR, Cell elongation genes	TTTGCTGCCTTTGTTGCTCT	GTGGAGGAGGAGAAGCGTAG		At1g21310
CsIAA19	qPCR, Cell elongation genes	GCGACTTCATCTGCAGTCAA	CGTGGCCTCTGTTTTCTTCA		At3g15540
CsXTH17	qPCR, Cell elongation genes	AGAGGATGGCTGTCGGAAAA	TCTCTTGGCGTCGGTACAAT		At1g65310
CsXTR6	qPCR, Cell elongation genes	TAACTCTGCTGGCACTGTCA	AGGCTCCCACTCAAGTTAC		At4g25810
BD-SH1	yeast two hybrid (Y2H)	CATGGAGGCCGAATTCATGGAGGTAACGCCATTCTAG	GCAGGTCGACGGATCCTCATCTAAATAGCATCTTGAGCTC	EcoR1/BamH1	
BD-COP1	yeast two hybrid (Y2H)	CATGGAGGCCGAATTCATGGACGACGGATCAACCCGG	GCAGGTCGACGGATCCTTAAACCGCAAGAACCAGCACC	EcoR1/BamH1	
AD-HY5	yeast two hybrid (Y2H)	GGAGGCCAGTGAATTCATGCAGGAGCAAGCGAC	CGAGCTCGATGGATCCTCACTCACCCTTCTCCTAC	EcoR1/BamH1	
AD-COP1	yeast two hybrid (Y2H)	GGAGGCCAGTGAATTCATGGACGACGGATCAACCCGG	CGAGCTCGATGGATCCTTAAACCGCAAGAACCAGCACC	EcoR1/BamH1	
AD-UVR8	yeast two hybrid (Y2H)	GGAGGCCAGTGAATTCATGGAAGCGACTTCTCCAG	CGAGCTCGATGGATCCTCAGACACGTAACCTTTTACATC	EcoR1/BamH1	