

Combining the null Kunitz trypsin inhibitor and yellow mosaic disease resistance in the soybean (*Glycine max* (L.) Merrill)

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Electronic Supplementary Material (ESM)

The authors are fully responsible for both the content and the formal aspects of the electronic supplementary material. No editorial adjustments were made.

Table S1. Sequence and annealing temperature of the primers used for the PCR amplification of the genomic DNA

Target trait	Primer	Sequence	Annealing temperature (°C)
<i>Null kti</i>	Gene specific F	5'CTTTTGTGCCTTCACCCACCT-3	55
	Gene specific R	5'GAATT CATCATCAGAACTCTA3'	
<i>Kti</i> locus	Satt228 F	5'TCATAACGT AAGAGATAATAAACT3'	47
	Satt228 R	5'CATTATAAGAAA ACGTGCTAAAGAG3'	
<i>Kti</i> locus	Satt409 F	5'CCTTAGACCATGAATGTCTCGAAGAA3'	56
	Satt409 R	5'CTTAAGGACACGTGGAAGATGACTAC3'	
YMV locus	Sat_076F	5'GCGTAATTAACACCAATATATGACATG3'	51
	Sat_076R	5'GCGGGGTAAAAATTCAAATGT3'	
YMV locus	Satt322F	5'GGGACCCATCATTAAGAA3'	49
	Satt322R	5'GTTTTGCCGGACACCACA3'	
YMV locus	BARCSOYSSR_02_0423F	5'CCTTCTCCAACCTAAGGGAA3'	52
	BARCSOYSSR_02_0423R	5'GCATCTTGTGCAGAATCCAT3'	
YMV locus	BARCSOYSSR_02_0425F	5'TTGGACTAGAAATTTGTTTGAAGA3'	49
	BARCSOYSSR_02_0425R	5'GGACTAAGTTTCCATAACATTAACAA3'	

Table S2. Rating scale for yellow mosaic disease (Singh & Bhan 1998)

Grade	Description	Reaction
1	no visible symptoms or minute yellow specks covering 1.1–5% of the leaf area	resistant (R)
3	mottling of leaves covering 5.1–15% of the leaf area	moderately resistant (MR)
5	yellow mottling and discolouration of 15.1–30% of the leaf area	moderately susceptible (MS)
7	pronounced yellow mottling and discolouration of the leaves and pods, reduction in the leaf size and the stunting of plants covering 30.1–75% of the foliage	susceptible (S)
9	severe yellow discolouration of the leaves covering 75.1–100 % of the foliage, the stunting of plants and a reduction in the pod size	highly susceptible (HS)

<https://doi.org/10.17221/47/2020-CJGPB>
Table S3. Evaluation of the phenotypic and genotypic data of the genotypes for the *null kti* and yellow mosaic disease (YMV) resistance

S. No.	Genotype	TIA (TIU/g)	<i>Null kti</i> specific amplicon	SSR primer Satt409	YMV score mean of two years (F_4 and F_5)	SSR primer Satt322
1	SLNR1-1	68.3	A	K	4	H
2	SLNR1-3	86.3	A	K	3	H
3	SLNR2-2	89.1	A	K	3	R
4	SLNR2-3	84	A	K	2	R
5	SLNR3-1	106.3	A	K	3	R
6	SLNR3-2	117.2	A	K	3	R
7	SLNR3-3	84.2	A	K	3	R
8	SLNR3-4	31.2	A	K	3	R
9	SLNR2-1	57.3	P	H	2	R
10	SLNR4-2	79.3	P	H	3	R
11	SLNR9-4	91.3	P	H	3	R
12	SLNR4-4	82.6	A	K	2	R
13	SLNR5-1	82.4	A	K	3	R
14	SLNR5-2	75.6	A	K	3	R
15	SLNR5-3	75.2	A	K	1	R
16	SLNR5-4	90.2	A	K	1	R
17	SLNR6-2	90.5	A	K	3	R
18	SLNR6-4	71.4	A	K	3	R
19	SLNR7-1	79.3	A	K	3	R
20	SLNR7-2	97.4	A	K	1	R
21	SLNR7-3	84.6	A	K	3	R
22	SLNR7-4	86.4	A	K	1	R
23	SLNR1-4	14.2	P	N	3	R
24	SLNR8-2	9.6	P	N	3	R
25	SLNR8-3	84.9	A	K	3	R
26	SLNR 11-2	44.4	P	H	1	R
27	SLNR9-3	6.5	P	N	1	R
28	SLNR9-2	101.4	A	K	1	R
29	SLNR8-1	82.3	A	K	3	R
30	SLNR8-4	14.9	P	N	3	R
31	SLNR25-1	76.6	A	K	3	R
32	SLNR11-4	2.1	P	N	3	R
33	SLNR25-2	81.5	A	K	1	R
34	SLNR12-4	1.9	P	N	4	H
35	SLNR13-1	13.5	P	N	3	R
36	SLNR25-4	72.5	A	K	3	R
37	SLNR13-4	3.4	P	N	1	R
38	SLNR14-1	6.2	P	N	1	R
39	SLNR14-4	6.3	P	N	3	R
40	SLNR15-3	3.7	P	N	1	R
41	SLNR15-4	4.5	P	N	1	R
42	SLNR16-3	6.2	P	N	3	H
43	SLNR16-2	5.1	P	N	1	R

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Table S3 to be continued

S. No.	Genotype	TIA (TIU/g)	<i>Null kti</i> specific amplicon	SSR primer Satt409	YMV score mean of two years (F_4 and F_5)	SSR primer Satt322
44	SLNR16-4	1.6	P	N	1	R
45	SLNR17-1	8.3	P	N	3	R
46	SLNR16-1	47.4	P	H	3	R
47	SLNR18-1	6.4	P	N	1	R
48	SLNR18-3	1.5	P	N	1	R
49	SLNR19-1	1.5	P	N	3	R
50	SLNR19-3	6.7	P	N	3	R
51	SLNR19-4	48.4	P	H	1	R
52	SLNR20-1	4.4	P	N	1	R
53	SLNR20-2	7.3	P	N	1	R
54	SLNR20-3	17.3	P	N	1	R
55	SLNR21-1	6.1	P	N	1	R
56	SLNR21-4	66.4	P	H	1	R
57	SLNR22-1	12.4	P	N	1	R
58	SLNR22-3	4.4	P	N	1	R
59	SLNR22-4	97.4	A	K	1	R
60	SLNR23-1	6.5	P	N	1	R
61	SLNR23-3	8.4	P	N	1	R
62	SLNR24-1	2.4	P	N	3	R
63	SLNR24-2	2.4	P	N	1	R
64	SLNR11-3	5.4	P	N	1	R
65	SLNR12-1	1.5	P	N	1	R
66	SLNR13-3	4.4	P	N	1	R
67	SLNR26-1	79.4	A	K	3	R
68	SLNR26-2	86.5	A	K	3	R
69	SLNR26-4	110.6	A	K	3	R
70	SLNR27-2	132.3	A	K	1	R
71	SLNR27-4	57.2	A	K	1	R
72	SLNR28-1	80.5	A	K	3	R
73	SLNR28-3	132	A	K	1	R
74	SLNR28-4	82.4	A	K	3	R
75	SLNR29-1	112.6	A	K	2	R
76	SLNR29-2	141.3	A	K	2	R
77	SLNR29-3	86.3	A	K	3	R
78	SLNR30-1	78.3	A	K	3	R
79	SLNR30-2	78.5	A	K	3	R
80	SLNR30-3	81.4	A	K	1	R
81	SLNR30-4	78.2	A	K	1	R
82	SLNR31-1	99.2	A	K	1	R
83	SLNR31-2	80.3	A	K	1	R
84	SLNR31-4	72.5	A	K	3	R
85	SLNR32-1	84.3	A	K	1	R
86	SLNR32-2	130.7	A	K	1	R

Table S3 to be continued

S. No.	Genotype	TIA (TIU/g)	<i>Null kti</i> specific amplicon	SSR primer Satt409	YMV score mean of two years (F ₄ and F ₅)	SSR primer Satt322
87	SLNR32-3	71.4	A	K	1	R
88	SLNR32-4	92.9	A	K	3	R
89	SLNR33-1	86.5	A	K	3	R
90	SLNR33-3	75.7	A	K	3	R
91	SLNR33-4	72.5	A	K	1	R
92	SLNR34-1	75.5	A	K	1	R
93	SLNR34-2	11.4	P	N	3	R
94	SLNR34-4	2.2	P	N	3	R
95	SLNR35-3	75.5	A	K	1	R
96	SLNR36-1	14.4	P	N	3	R
97	SLNR36-2	8.2	P	N	3	R
98	SLNR36-3	38.2	A	K	1	R
99	SLNR36-4	4.6	P	N	2	R
100	SLNR37-1	2.4	P	N	1	R
101	SLNR37-2	4.5	P	N	3	R
102	SLNR37-4	18.3	P	N	3	R
103	SLNR38-1	78.5	A	K	3	R
104	SLNR38-3	79.4	A	K	1	R
105	SLNR38-4	108.5	A	K	1	R
106	SLNR39-1	94.4	A	K	3	R
107	SLNR39-2	81.6	A	K	1	R
108	SLNR39-3	78.2	A	K	1	R
109	SLNR39-4	145.3	A	K	3	R
110	SLNR40-1	122	A	K	3	R
111	SLNR41-1	9.5	P	N	1	R
112	SLNR41-2	1.4	P	N	3	R
113	SLNR41-4	35.6	P	H	3	R
114	SLNR42-1	11.5	P	N	3	R
115	SLNR42-2	5.4	P	N	3	R
116	SLNR42-4	5.5	P	N	1	R
117	SLNR43-2	42.3	P	H	3	R
118	SLNR44-1	120.1	A	K	3	R
119	SLNR44-2	44.5	A	K	3	R
120	SLNR44-4	79.4	A	K	3	R
121	SLNR45-1	9.3	P	N	3	R
122	SLNR4-1	7.4	P	N	1	R
123	SLNR4-3	3.5	P	N	3	R
124	SLNR15-1	36.1	P	H	3	R
125	SLNR17-2	3.7	P	N	3	R
126	SL525 (P1)	97.5	A	K	1	R
127	NRC101 (P2)	1.8	P	N	9	S

A – absent; P – present; N – *null kti* homozygous recessive; K – *Kti* homozygous; H – heterozygous; R – resistance homozygous; S – susceptible homozygous; TIU – trypsin inhibitor units; TIA – trypsin inhibitor activity