

Genetic diversity analysis in blackgram (*Vigna mungo*) genotypes using microsatellite markers for resistance to *Yellow mosaic virus*

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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. The pedigree details of the blackgram genotypes

S. No.	Germplasm accessions	Pedigree	S. No.	Germplasm accessions	Pedigree
1	KU-12-668	Selection from TU 94-2	26	VBG-11-037	ADT 5 × <i>Vigna mungo</i> var. <i>silvestris</i>
2	ABG-11-004	VBN 1 × VBN 3-3	27	IC281999	Kolhar, Adilabad, A P
3	IC436720	Landrace-Bhimpur, Adilabad, AP	28	IC 413304	Landrace- Gangwar, Medak,
4	VBG-12-042	VBN 5 × COBG 757	29	IC343939	Land race
5	VBG-11-018	VBG 73 × <i>Vigna mungo</i> var. <i>silvestris</i>	30	IC343885	Land race
6	IC-436784	Land race	31	VBG-11-050	ADT 5 × <i>Vigna mungo</i> var. <i>silvestris</i>
7	VBG-12-005	VBN 3 × <i>Vignamungo</i> var. <i>silvestris</i>	32	IC 281994	Singango, Adilabad, AP
8	ABG-11-011	RBU 38 × TMV 1/4/1	33	IC 436758	Land race
9	VBG-11-020	VBN 5 × VBG 04-001	34	KKB-14-011	IPU 2006-01 × TNY local
10	IC-398989	Landrace- Vinjamur, Nellore, AP	35	VBG 13-023	VBN 5 × VBN 4
11	VBG.12.034	VBN 1 × KU 238	36	VBG 10053	VBN 2 × VBN 04003
12	IPU.0233	–	37	IC 281989	Pochara, Adilabad, AP
13	VBG10.010	AD 75 × <i>Vigna mungo</i> var. <i>silvestris</i>	38	IC 282002	Machkal, Adilabad, AP
14	KU.12.39	Selection from COBG 10-05	39	ABG 11-030	CO 5 × AC 196/3/3
15	ABG.11.013	VBN 4 × Co(Bg) 629/8/3	40	IC 282007	Narsapur, Madak, AP
16	IC281986	Lakkanpur, Adilabad, AP	41	IC 281993	Singango, Adilabad, AP
17	VBG-11-043	AD 75 × <i>Vigna mungo</i> var. <i>silvestris</i>	42	VBG-14-003	KU 216 × VBN 3
18	KU-11-680	Selection from IPU 99-33	43	IC 282008	Land race
19	ABG-11-028	Co(Bg) 671 X ADT 5	44	IC 281792	Land race
20	ABG-11-032	Co 5 × VBN 4/6/1	45	VBG 11-028	ADT 5 × <i>Vigna mungo</i> var. <i>silvestris</i>
21	ABG-11-011	RBU 38 × TMV 1/4/1	46	VBG-12-121	VBN 3 × AM 6
22	IC343967	Rampachodavaram East Godavari, AP	47	IC 281980	Thumikipad, Khammam, AP
23	VBG-11-044	VBG 73 × <i>Vignamungo</i> var. <i>silvestris</i>	48	IC 281982	Pashathand, Adilabad, AP
24	ADT-5	Pure line selection from kanpur	49	KKB-14-001	IPU 2006-01 × ADT 3
25	VBG-11-046	ADT 5 × <i>Vignamungo</i> var. <i>silvestris</i>	50	IC 281977	Penpahad, Nalgonda, AP
51	VBG 14-015	VBN 5 × PU 31	77	VBG-12-122	VBN 3 × AM 6
52	VBG 11045	VBG 73 × <i>Vignamungo</i> var. <i>silvestris</i>	78	VBG 11024	ADT 5 × <i>Vigna mungo</i> var. <i>silvestris</i>
53	VBG-11-041	ADT5 × <i>Vigna mungo</i> var. <i>silvestris</i>	79	IC 436736	Landrace-Lokari, Adilabad, A P
54	IC398970	Kammapalli, Prakasam, AP	80	VBG-14-013	Selection from ACM 05 007
55	IC281987	Chinchalli, Adilabad, AP	81	IC282004	Improved cultivar- Mudhol, Adilabad, AP
56	KKB 14-003	IPU 2006-01 × TNY local	82	VBG 10-024	VBG 73 × <i>Vigna mungo</i> var. <i>silvestris</i>
57	VBG-12-122	VBN 3 × AM 6	83	VBG-11-027	ADT 5 × <i>Vigna mungo</i> var. <i>silvestris</i>
58	VBG-12-039	VBN 1 × PU 31	84	VBG-11-042	ADT 5 × <i>Vigna mungo</i> var. <i>silvestris</i>
59	IC281978	Aathukur, Khammam, AP	85	VBG 12-093	VBG 73 × <i>Vigna mungo</i> var. <i>silvestris</i>
60	IC436724	Lokari, Adilabad, AP	86	IC343962	Others- Sunnampadu, East Godavari, AP
61	ABG-11-035	Co(Bg) 671 × Co(Bg) 647/3/3	87	IC281982	Improved cultivar- Pashathand, Adilabad, AP
62	ABG-11-037	Co(Bg) 671 × ADT 5	88	IC335331	Others- Mimillapally, Ponnur, Guntur, AP
63	VBG-11-033	VBG 73 × <i>Vignamungo</i> var. <i>silvestris</i>	89	VBG-11-029	VBG 73 × <i>Vignamungo</i> var. <i>silvestris</i>
64	ABG-11-015	RBU 38 × TMV 1/1/1	90	IC281991	Kolhar, Adilabad, AP
65	IC343943	Others- Chandhurthi, East Godavari, AP	91	ABG-11-036	Co(Bg) 671 × Co(Bg) 647/1/4
66	VBG-12-034	VBN 1 × KU 238	92	VBG-11-040	VBN 1 × <i>Vignamungo</i> var. <i>silvestris</i>
67	KKB 06-012	VBN3 × COBG 643	93	VBG-13-019	VBN 3 × <i>Vignamungo</i> var. <i>silvestris</i>
68	IC436765	Liguguda, Adilabad, AP	94	IC281990	Daltabad, Adilabad, AP
69	VBG 12062	PU 31 × CO 6	95	IC436536	Siripuram, RangaReddy, AP

<https://doi.org/10.17221/8/2020-PPS>

70	IC 281992	Singango, Adilabad, AP	96	IC343947	Others- Seethapally, East Godavari, AP
71	IC281984	Improved cultivar- Rolemanda, Adilabad, AP	97	KU-11-667	Selection from UH 07-06
72	VBG 13-017	VBN 3 × <i>Vignamungo</i> var. <i>silvestris</i>	98	IC281995	Singango, Adilabad, AP
73	IC436727	Landrace- Lokari, Adilabad, AP	99	KKB-05-011	CoBg 643 × VBN 3
74	IC282001	Improved cultivar- Machkal, Adilabad, AP	100	APK-1	ADT 2 × RU 1
75	IC436811	Landrace- Gottipattar, Adilabad, AP	101	VBN 4	CO 4 × PDU 102
76	VBG-12-056	PU 31 × CO 6	102	ADT 3	Pureline selection from Tirunelveli local

Table S2. List of microsatellite markers used for surveying blackgram genotypes

Sl. No	Primer	Sequences	References
1	CEDG204(F)	CCTTGGTTGGAGCAGCAGC	Chatieng et al. 2006
	CEDG204(R)	CACAGACACCCTCGCGATG	
2	CEDG139(F)	CAAACCTCCGATCGAAAGCGCTTG	Chatieng et al. 2006
	CEDG139(R)	GTTTCTCCTCAATCTCAAGCTCCG	
3	CEDG008(F)	AGGCGAGGTTTCGTTTCAAG	Chatieng et al. 2006
	CEDG008(R)	GCCCATATTTTTACGCCAC	
4	CEDG268(F)	CATCTCCCTGAAACTTGTG	Chatieng et al. 2006
	CEDG268(R)	GCTATCAATCGAGTGCAG	
5	CEDG030(F)	TGAGGGAATGGGAGAGAGGC	Han et al. 2005
	CEDG030(R)	TCCGCAGATAGAGGCTCACG	
6	CEDG092(F)	TCTTTTGGTTGTAGCAGGATGAAC	Chatieng et al. 2006
	CEDG092(R)	TACAAGTGATATGCAACGGTTAGG	
7	CEDG022(F)	AGGAATGTGAGATTTG	Han et al. 2005
	CEDG022(R)	AATCGCTTCAAGGTCAAGCC	
8	CEDG024(F)	CATCTCCTCACCTGCATTC	Han et al. 2005
	CEDG024(R)	TTTGGTGAAGATGACAGCCC	
9	CEDG198(F)	CAAGGAAGATGGAGAGAATC	Han et al. 2005
	CEDG198(R)	CCTTCTAAGAACAGTGACATG	
10	CEDG013(F)	CGTTCGAGTTTCTTCGATCG	Chatieng et al. 2006
	CEDG013(R)	ACCATCCATCCATTCGCATC	
11	DMB-SSR182(F)	TAGAGCCTTCTGGTTTTTCACA	Somta et al. 2009
	DMB-SSR182(R)	AGGAGGAGGATTTTGATGATGA	
12	DMB-SSR186(F)	GAGAGAGAAGGAGAGGGAGA	Somta et al. 2009
	DMB-SSR186(R)	ATTCTTCTCCACCACAATG	
13	CEDG133(F)	GCATACATAATGTGGTGAGATG	Chatieng et al. 2006
	CEDG133(R)	GTCTCGTGCCTTTCACAC	
14	CEDG141(F)	CCAGGCATCCATGATGACC	Chatieng et al. 2006
	CEDG141(R)	GAAGTTGTTGGTAATGGTTGCCTC	
15	CEDG225(F)	GAGGAAGTGTTCAGCACC	Chatieng et al. 2006
	CEDG225(R)	GAGGAAGTGTTCAGCACC	
16	CEDG284(F)	GGTGCTAACGTTGAAACTGAG	Chatieng et al. 2006
	CEDG284(R)	CACTCCATTCTGAGGATCAATCC	
17	CEDG127(F)	GGTTAGCATCTGAGCTTCTTCGTC	Chatieng et al. 2006
	CEDG127(R)	CTCCTCACTTGGTCTGAAACTC	
18	CEDG014(F)	GCTTGCATCACCCATGATTC	Chatieng et al. 2006
	CEDG014(R)	AAGTGATACGGTCTGGTTCC	
19	CEDG020(F)	TATCCATACCCAGCTCAAGG	Chatieng et al. 2006
	CEDG020(R)	GCCATACCAAGAAAGAGG	
20	CEDG067(F)	AGACTAAGTTACTTGGGCAACCAG	Chatieng et al. 2006
	CEDG067(R)	TGACGGCCCGCTCTCC	
21	CEDG245(F)	GATAGAGCTTAAACCCTC	Han et al. 2005
	CEDG245(R)	CTTTTGATGACAAATGCC	
22	CEDG059(F)	AGAAAAGGTTGGCCTCGTTG	Han et al. 2005
	CEDG059(R)	GCAGGCATTTCCATCGCAG	

<https://doi.org/10.17221/8/2020-PPS>

23	CEDG112(F)	GCAATATTCGCATTATTCATTCA	Han et al. 2005
	CEDG112(R)	GTGTTTCAAAGCACTATACTTAA	
24	CEDG269(F)	CTGTTACGGCACCTGGAAAG	Han et al. 2005
	CEDG269(R)	GCAGAGACACACCTTAACCTTG	
25	CEDC011(F)	GTCCGACTTTATGTGTGGAG	Chatieng et al. 2006
	CEDC011(R)	TTTCTAGTTCCAGCCCCGAC	
26	CEDG056(F)	TTCCATCTATAGGGGAAGGGAG	Chatieng et al. 2006
	CEDG056(R)	GCTATGATGGAAGAGGGCATGG	
27	CEDG044(F)	TCAGCAACCTTGCATTGCAG	Chatieng et al. 2006
	CEDG044(R)	TTTCCCCTCACTCTTCTAGG	
28	VrCSSR3(F)	GCAGACACAACCATAAAATCC	Zhang et al. 2008
	VrCS SSR3(R)	GGTCTTTGACGGCAATCTC	
29	CEDG180 (F)	GGTATGGAGCAAAACAATC	Chatieng et al. 2006
	CEDG180 (R)	GTGCGTGAAGTTGTCTTATC	

Table S3. Cluster mean of nine quantitative traits of blackgram

Cluster	Days to 50% flowering	Plant height (cm)	No. of primary branches per plant	No. of clusters/plant	No. of pods/plant	No. of seeds/pod	100 seed weight (g)	Single plant yield (g)	Protein content (g)
I	36.25	43.55	5.55	7.20	26.94	6.54	4.69	9.08	22.92
II	36.22	41.85	5.76	7.79	25.37	6.52	4.81	17.32	23.79
III	34.31	27.74	6.13	6.59	29.41	6.43	4.47	9.51	20.71
IV	40.50	53.30	4.80	6.10	30.50	7.00	5.54	13.05	26.79
V	36.50	49.10	5.60	4.00	16.00	7.10	5.15	7.16	22.18
VI	37.50	43.60	3.80	4.20	16.80	6.33	3.82	9.82	21.45
VII	38.00	54.70	8.60	4.60	23.00	7.10	4.61	9.70	26.39
VIII	32.50	45.80	7.00	10.80	43.20	6.00	4.32	9.80	20.83
IX	37.61	49.40	6.41	10.88	40.69	6.20	4.48	11.14	24.29
X	32.00	36.45	4.80	10.80	32.40	7.50	6.44	5.15	27.13
XI	43.00	41.00	4.30	13.60	24.00	7.30	4.30	8.20	20.10
XII	38.50	52.30	7.80	3.20	16.00	7.80	6.20	15.90	19.58
XIII	43.50	58.80	10.65	5.20	26.00	7.40	4.30	14.30	22.14
XIV	37.00	46.40	5.60	8.40	25.20	6.00	4.53	29.10	23.33
XV	35.00	40.20	3.60	3.85	19.25	6.80	4.56	29.00	25.23
XVI	34.50	31.24	4.60	15.80	48.40	5.62	4.20	4.38	21.30
XVII	37.50	29.46	7.80	5.60	48.80	6.80	4.20	9.30	21.24
XVIII	34.00	44.70	8.45	18.40	28.00	6.25	4.00	7.98	23.37
MEAN	36.91	43.86	6.18	8.16	28.8	6.70	4.70	12.21	22.93

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