

Sowmiya M, Manonmani S, Selvi NR, Saraswathi R, Suresh R, Gopalakrishnan C, Raveendran M, Dhamotharan P. Identification of false smut - resistant donors in Rice (*Oryza sativa* L.) and analysis of their morpho-molecular diversity for resistance breeding. Plant Science Today (Early Access). <https://doi.org/10.14719/pst.4242>

Table 1. Mean data of the genotypes for all the traits.

Sl. No.	Genotypes	NIPP	NIGPa	NIGP	PIPP	PIGPa	DFP	PH	NPT	PL	NFPP	NCGP	PSS	HSW	SPY
1	Panamara sambha	1.00	1.00	1.33	13.39	1.09	94.00	118.10	22.67	26.53	149.00	12.33	16.87	2.24	37.45
2	Arupatham sambha	4.33	1.00	6.00	25.72	1.17	98.67	122.25	22.67	24.65	119.00	13.33	19.67	1.40	16.60
3	Channagi	0.00	0.00	0.00	0.00	0.71	94.33	121.33	27.00	20.70	96.00	5.50	13.85	2.23	17.48
4	Poongar selection	1.00	1.00	1.33	10.79	1.08	83.00	107.96	28.67	22.75	155.33	10.00	13.73	2.32	26.17
5	Kapikar selection	0.00	0.00	0.00	0.00	0.71	111.67	107.66	33.00	21.00	119.00	15.00	19.24	1.57	31.45
6	Varigarudan sambha	4.33	4.33	13.33	28.85	2.15	99.00	111.39	19.00	20.60	104.33	21.33	26.69	1.92	12.04
7	Varigarundam sambha selection	5.33	3.00	11.67	33.41	1.53	126.67	118.66	18.00	21.67	162.00	23.33	22.23	1.78	14.30
8	Kama sambha	8.33	2.00	16.00	43.71	1.44	99.67	110.66	17.67	23.73	122.00	7.00	13.83	1.22	21.50
9	Kama sambha selection	1.67	1.33	2.33	17.08	1.12	95.00	123.33	19.00	23.57	170.00	20.33	20.27	1.81	19.75
10	Karthigai sambha	8.00	2.00	17.33	34.52	1.57	117.33	129.92	25.00	22.23	105.00	47.00	42.72	1.10	13.73
11	Purple puttu	1.00	1.00	1.00	16.81	1.17	95.67	144.02	12.00	21.07	115.00	5.33	12.12	2.13	18.76
12	Chithan sambha	1.00	0.67	0.67	14.61	1.00	109.67	113.34	16.00	22.30	118.00	5.00	11.87	2.18	17.58
13	Ghandhasala	1.00	1.33	2.00	14.27	1.26	108.00	109.33	16.67	20.60	120.33	9.00	15.29	2.30	45.03
14	Norungam	1.00	0.67	0.67	14.04	1.10	92.67	121.66	18.00	21.23	90.00	4.00	12.09	2.84	28.37
15	Kallukar	4.00	1.00	3.00	30.61	1.07	98.00	133.40	16.00	21.25	161.00	2.33	6.91	2.07	26.30
16	Kallundikar	2.67	3.00	6.67	20.50	1.71	90.67	128.01	22.00	22.50	142.00	19.00	23.20	2.82	24.86
17	Vadakathi sambha	2.00	1.00	0.67	20.08	1.17	125.67	138.67	17.00	21.20	116.33	19.00	23.28	1.63	13.87
18	Sadai sambha	4.33	3.00	16.33	24.10	1.83	111.33	149.23	26.00	22.10	105.00	32.00	33.39	1.48	12.53
19	Thulasi vasanai sambha	0.00	0.00	0.00	0.00	0.71	108.33	114.85	38.00	24.00	173.33	10.00	13.81	1.84	12.05
20	Rajamudi	3.00	5.67	14.67	22.43	2.42	112.33	130.02	20.67	23.60	108.33	42.67	39.25	1.66	10.51
21	Arupatham vellai	3.33	1.00	3.00	25.03	1.13	104.67	109.82	19.00	21.40	132.00	32.67	30.24	1.47	16.38
22	Mangam sambha	3.33	1.33	3.67	24.86	1.40	114.67	111.23	19.33	19.25	92.00	6.00	14.87	1.72	15.53
23	Burma block	3.00	1.00	1.33	23.41	1.41	111.67	117.43	19.00	19.67	67.33	27.67	39.54	1.47	18.70
24	Godavari sambha	1.00	2.00	2.00	10.37	1.48	102.00	122.95	31.00	24.15	119.00	47.67	39.33	1.39	22.57

25	Vadivel	2.00	1.00	2.00	29.00	1.20	118.67	112.32	8.67	24.73	107.00	61.67	49.51	1.22	11.20
26	Karungam	1.33	1.00	1.00	16.38	1.15	106.67	124.33	16.67	23.00	123.00	5.33	11.72	1.82	17.50
27	Pamani sambha	3.00	2.00	3.33	21.72	1.60	115.67	121.33	22.00	19.25	97.00	44.67	42.78	1.84	27.24
28	Arasambha	1.00	0.67	1.00	11.76	1.07	119.33	117.09	24.33	22.43	95.67	27.67	32.53	2.32	29.20
29	Koolavalai	0.00	0.00	0.00	0.00	0.71	114.33	119.69	20.00	22.37	121.00	7.67	14.58	1.12	28.20
30	Chinna aduku nel	8.00	1.00	8.67	39.41	1.05	112.33	158.65	20.00	25.20	168.00	52.67	34.27	1.31	27.32
31	Periya chandikar	0.00	0.00	0.00	0.00	0.71	116.00	141.58	26.33	23.25	136.00	12.00	17.29	2.70	34.98
32	RPHP125	4.00	2.00	5.00	29.05	1.47	71.00	117.67	17.00	21.20	120.67	25.33	27.30	1.04	20.07
33	Kaltikar	2.67	1.00	3.00	17.46	1.34	104.33	101.33	29.33	23.00	77.70	44.67	49.33	0.91	15.46
34	Earapalli	0.00	0.00	0.00	0.00	0.71	105.00	138.24	23.67	19.43	96.67	31.67	34.94	2.02	24.74
35	Kalarkar	3.67	2.00	6.00	21.93	1.75	116.00	125.46	26.33	23.43	78.33	26.67	35.69	1.21	23.87
36	Sornavari	0.00	0.00	0.00	0.00	0.71	105.00	90.60	14.50	18.00	58.00	26.33	42.50	1.67	16.13
37	RPHP103	5.33	1.33	6.33	31.13	1.52	83.00	101.17	20.00	20.77	72.00	5.77	16.42	1.44	16.23
38	Ramakuruvaikar	5.00	2.00	6.33	24.66	1.61	78.33	116.61	28.73	23.47	96.00	33.67	36.32	1.38	23.37
39	Murungankar	1.67	3.00	3.67	22.97	1.73	104.33	114.00	10.67	22.73	120.33	14.00	19.94	1.27	11.17
40	IG71	0.00	0.00	0.00	0.00	0.71	66.00	105.46	19.33	12.33	36.00	1.63	12.14	1.25	11.81
41	Jeevan sambha	1.00	2.00	2.00	13.20	1.94	108.67	118.71	19.33	17.37	61.33	1.97	10.31	1.40	11.79
42	RPHP104	3.33	1.00	3.33	23.04	1.11	74.67	79.54	21.73	24.08	134.77	19.00	22.05	1.47	21.50
43	IG49	3.67	1.00	3.33	21.57	1.08	73.33	111.11	27.00	23.57	150.87	16.67	19.43	1.69	22.60
44	RP-Bio-226	2.00	1.00	2.00	19.96	1.11	67.33	75.12	17.20	18.13	136.33	52.00	38.12	1.27	20.01
45	RH2-SM-1-2-2	6.33	2.00	10.00	47.21	1.85	78.00	124.48	11.77	21.47	68.67	13.30	26.13	2.08	16.54
46	Red sirumani	5.00	4.00	13.67	32.64	1.87	66.00	107.52	17.33	27.40	133.67	30.13	28.35	1.36	13.96
47	Katta sambha	7.33	1.67	10.67	42.98	1.20	109.67	109.62	15.80	24.10	175.00	17.87	18.64	1.92	27.48
48	Ponmani sambha	2.33	3.33	9.00	25.95	2.22	116.33	105.30	12.23	17.60	75.00	9.93	21.36	2.23	13.92
49	IG75	5.00	4.00	15.67	29.82	1.71	64.67	111.89	20.23	26.13	166.33	27.77	24.18	1.35	19.67
50	Chinna aduku nel selection	1.00	1.00	1.00	18.11	1.26	109.67	97.50	10.37	19.57	91.67	9.77	19.07	2.18	20.36
51	IG12	1.00	1.00	1.00	13.65	1.29	82.67	111.66	17.97	20.67	86.00	11.43	21.39	1.59	24.30
52	Thillainayagan	0.00	0.00	0.00	0.00	0.71	105.67	131.00	21.83	21.27	92.67	24.83	31.17	1.59	18.75
53	Vellai kudaivelan	5.33	2.00	11.33	40.01	1.70	93.67	128.00	12.90	22.60	83.33	13.30	23.58	1.73	11.43

54	RPHP163	0.00	0.00	0.00	0.00	0.71	100.33	93.06	7.13	22.17	127.00	41.33	34.77	1.44	10.75
55	IG18	0.00	0.00	0.00	0.00	0.71	110.67	124.12	15.93	24.37	120.00	38.63	34.65	1.59	14.80
56	IG28	2.00	1.00	2.00	27.66	1.23	111.67	150.34	9.30	21.20	99.33	18.97	25.90	1.55	14.87
57	Nootripatum	7.33	4.00	23.00	58.76	2.11	116.00	111.50	10.03	22.50	101.33	44.50	41.57	1.55	13.98
58	Muthuvellai	0.00	0.00	0.00	0.00	0.71	106.00	109.44	8.40	20.50	113.33	9.87	17.18	2.04	16.16
59	Uppumolagai	6.67	6.00	21.00	35.66	2.51	111.67	137.49	19.63	27.00	104.00	14.23	21.73	1.67	16.84
60	Rangoon sambha	8.33	5.67	23.67	44.59	2.20	105.33	156.24	16.90	28.00	130.67	38.53	32.91	1.47	18.58
61	CO 43	7.67	8.00	34.33	41.95	2.78	116.67	86.11	17.17	23.33	110.57	18.50	24.14	1.55	19.23
62	RPHP42	0.00	0.00	0.00	0.00	0.71	112.67	130.27	11.93	30.33	109.67	6.67	14.31	1.24	13.33
63	CO 50	9.33	9.00	33.00	50.74	2.83	114.00	93.18	15.80	27.50	120.00	21.33	24.85	1.34	18.69
64	IG25	0.00	0.00	0.33	0.00	0.71	108.00	142.52	14.83	32.67	104.67	6.67	14.59	1.22	14.80
Min		0.00	0.00	0.00	0.00	0.71	64.67	75.12	7.13	12.33	36.00	1.63	6.91	0.91	10.51
Max		9.33	9.00	34.33	58.76	2.83	126.67	158.65	38.00	32.67	175.00	61.67	49.51	2.84	45.03
SD		2.69	1.91	8	14.89	0.55	17	19.58	6.92	3.3	32.3	15.09	10.78	0.47	7.21

NIPP- number of infected panicles/plant NIGPa-number of infected grains/panicle, NIGP- number of infected grains/plant, PIPP- percentage of infected panicles/plant, PIGPa - percentage of infected grains/panicle, DFF- days to fifty per cent flowering, PH-plant height, PL-panicle length, NPT-number of productive tillers, NFPP -Number of florets/panicle, NCGP- number of chaffy grains/panicle, PSS- percentage of spikelet sterility, HGW- Hundred grain weight, SPW- single panicle weight, SPY- single plant yield.

Table 2. Percent contribution of traits to total divergence.

Traits	Rank	Contribution %
NIPP	142	7.04
PIPP	203	10.07
NIGPa	102	5.06
NIGP	782	38.79
PIGPa	29	1.44
DFF	52	2.58
PH	10	0.50
NPT	48	2.38
PL	46	2.28

NFPP	40	1.98
NCGP	336	16.67
PSS	83	4.12
HSW	16	0.79
SPY	127	6.29

NIPP- number of infected panicles/plant NIGPa-number of infected grains/panicle, NIGP- number of infected grains/plant, PIPP- percentage of infected panicles/plant, PIGPa - percentage of infected grains/panicle, DFF- days to fifty per cent flowering, PH-plant height, PL-panicle length, NPT-number of productive tillers, NFPP -Number of florets/panicle, NCGP- number of chaffy grains/panicle, PSS- percentage of spikelet sterility, HGW- Hundred grain weight, SPW- single panicle weight, SPY- single plant yield.

Table 3. Genotype clusters based on Jaccard distance.

Clusters	Genotypes
Cluster 1	Panamara sambha, Arupatham sambha, Channagi, Poongar selection, Kapikar selection, Varigarudam sambha selection, Kama sambha, Kama sambha selection, Karthigai sambha, Purple puttu, Chithan sambha
Cluster 2	Varigarudan sambha, Ghandhasala, Vadakathi sambha, Sadai sambha, Thulasi vasanai sambha, Arupatham vellai, Godavari sambha, Arasambha, Periya chandiyar, Murungankar, IG28, RPHP42
Cluster 3	Norungam, Rajamudi, Kaltikar, Kalarkar, Sornavari, Ramakuruvaikar, Jeevan sambha, RPHP104, IG49
Cluster 4	Kallukar, Kallundikar, Pamani sambha, Chinna aduku nel, RPHP103, IG71, katta sambha, ponmani sambha, CO43
Cluster 5	Mangam sambha, Burma block, Karungam, Koolavalai, Earapalli, RP-Bio-226, RH2-SM-1-2-2, Red sirumani, Vellai kudaivelan, RPHP163, IG18
Cluster 6	Vadivel, RPHP125, IG75, Chinnadukunel selection, IG12, Thillainayagan, Nootripatum, Muthuvellai, Uppumolagai, Rangoon sambha

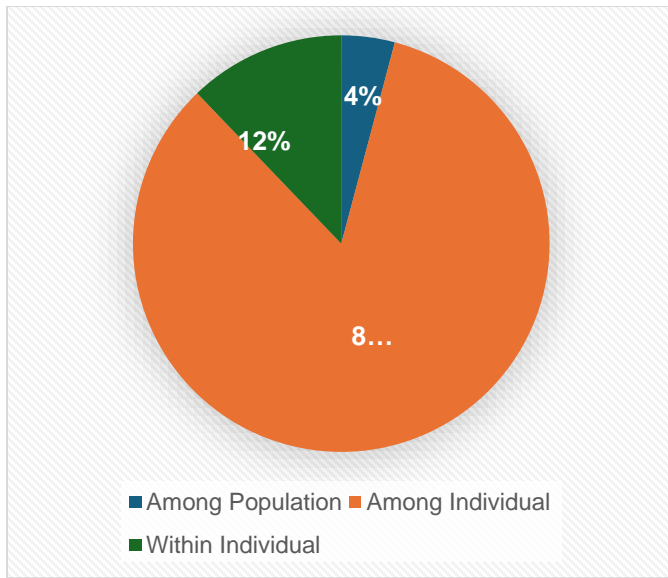


Fig. 1. Molecular variance percentage identified through AMOVA.