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Short Communication

ALTERNATIVE SOURCE OF RESISTANCE FOR BACTERIAL LEAF BLIGHT DISEASE OF RICE

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Bacterial Leaf Blight (BLB) of rice caused by *Xanthomonas campestris* pv. *oryzae* (Ishiyaa) Dye has been occurring in different levels of severity depending upon the degree of susceptibility of rice cultivar grown in different parts of the country. Varieties selected for disease resistance have often become susceptible due to pathogen adaptability. Resistance in cultivated rices has remained only for a shorter durations. Among the wild rice, *Oryza barthii* was earlier reported to be immune to the disease (Devadath, 1983). An attempt has been made in the present study to test number of accessions of different wild species of *Oryza* and to identify additional sources of resistance.

Forty-two accessions belonging to 17 species of wild rices maintained at Central Rice Research Institute (CRRI), Cuttack, India were used for this study. Two tillers in each of the species were removed from the original plants and planted in 12" diameter earthen pots filled with 10 kg of well puddled field soil. They were fertilized with urea @ 120 kg N/ha and irrigated regularly with tap water.

Culture of *Xanthomonas capestris* pv. *oryzae* used for this study was isolated from rice cultivar IR8 (CRXCO 28) grown in the farm of CRRI. Single colony isolates were maintained on the slants of potato-sucrose-agar medium. Forty-eight hour old bacterial culture was used for artificial inoculation. Bacterial suspension was made in sterile distilled water and its concentration was adjusted to @ 10^9 cells/ml.

Forty-five days after planting, fully developed top 2-3 leaves were inoculated through clipping method (Kauffman *et al.*, 1973). Observations were recorded on period of incubation for initial symptom expression and progress of the lesion was monitored at five day intervals until 25 days after inoculation.

Wild accessions of *Oryza* species have shown in general reduced lesion-length when compared to cultivated rice variety IR-8. Wide variations

Table 1. Reaction of different accessions of 17 wild species of *Oryza* against bacterial blight disease of rice

Oryza species	Accession No.	Incubation period for symptom expression (days)	Maximum lesion length (cm)	Reaction R = Resistant S = Susceptible
O. longistaminata	RN 1014	8	2.7	R
	RN 1026	10	1.1	R
	RN 1027	10	0.9	R
	RN 1059	10	5.0	S
O. officinalis	RN 1047	8	3.5	R
	RN 1049	6	10.6	S
	RN 1050	7	3.1	R
	RN 1052	8	3.5	R
	RN 1053	6	13.0	S
	RN 1055	8	2.1	R
	RN 1066	8	3.1	R
	RN 1068	6	10.2	S
O. eichingeri	RN 1040	9	1.2	R
	RN 1041	9	1.7	R
	RN 1042	10	0.9	R
	RN 1065	9	1.1	R
O. minuta	RN 1024	10	1.3	R
	RN 1025	10	1.5	R
	RN 1028	9	2.1	R
	RN 1963	8	4.1	R
O. latifolia	RN 1001	8	7.1	S
	RN 1002	8	6.8	S
	RN 1005	9	3.3	R
	RN 1007	9	3.6	
O. nivara	RN 205	9	2.3	R
	RN 210	7	15.5	S
	RN 211	9	10.0	S
O. malampuzhaenis	RN 1046	8	4.9	S
	RN 1048	(no symptom)	0.0	R
	RN 1061	10	4.9	S
O. grandiglumis	RN 1002	11	4.2	
	RN 1055	10	5.5	S

(Cont. on next page)

Oryza species	Accession No.	Incubation period for symptom expression (days)	Maximum lesion length (cm)	Reaction R = Resistant S = Susceptible
O. australiensis	RN 201	7	16.1	S
	RN 202	7	13.8	S
P. coarctata	RN 1152	12	0.0	R
O. rufipogon	RN 1154	6	5.1	S
O. cubensis	RN 1019	7	3.0	R
O. punctata	RN 1034	6	10.0	S
O. collina	RN 206	9	1.9	R
O. schwenfurthiana	RN 1062	10	1.5	R
O. alta	RN 203	7	11.1	S
O. granulata	RN 999	10	2.6	R
O. sativa (IR 8)	Control	4	24.8	S

in lesion length was observed among different accessions of any single species of wild rices. However, twenty three out of 42 accessions of different species were found to be resistant to bacterial blight disease. Accessions resistant to the disease were found mostly in 12 out of 17 species tested. Majority of accessions resistant to the disease belong to the species of *Oryza longistaminata, O. officinalis, O. eichingeri* and *O. minuta*. In addition, accessions resistant to the disease were also found among the species of *O. latifolia, O. nivara, O. cubensis, O. collina* and *O. granulata* (Table 1). Characteristically, initiation and progress of the lesion was very slow with brown necrotic lesions covering entire width of the leaf in resistant host pathogen combination. While typical lesions developed under susceptible pathosystem, one of the accession of *O. malampuzhaeis* and *P. coarctata* did not develop any symptoms until 25 days after inoculation.

Incubation period required for symptom initiation varied greatly in different species of wild rice. Symptoms were expressed after six to seven days of inoculation in susceptible pathosystem, whereas it was between 8-10 days in incompatible host pathogen combination. Symptoms were initiated 10 days after inoculation in some of the accessions belonging to *O. longistaminata* and *O. eichingeri*. Maximum lesion length recorded in compatible host-pathogen combination was 15.5 cm in *O. nivara*, 13.8 and 16.1 cm in *O. australiensis* followed by some of the accessions of *O. alta, O. officinalis* and *O. punctata*. On the other hand, minimum lesion length of 1.1 to 4.1 cm was recorded in different species of *Oryza* as a result of host pathogen incompatibility.

It is evident from the studies that wild rice germplasm forms a great repository of genes conferring resistance against bacterial blight disease of rice which can be effectively used in inter-specific hybridization.

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