

RESEARCH NOTE

Rice Varietal Reaction to a new Gall-Midge (*Orseoli Oryzae* Wood Mason) Biotype in Sri Lanka

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The rice gall-midge (GM) *Orseoli oryzae* (Wood Mason) is a serious pest of rice in several parts of Sri Lanka and major control methods to contain the pest have been the use of resistant varieties and insecticides. Rice varieties Bg 276-5 and Bg 400-1 were bred and released to farmers in 1979 as varieties having GM resistance and up to about 1986 these varieties have played an important role in GM management. However, evolution of a new virulent biotype of this pest has complicated its management through varietal resistance. Therefore, there is a need to find sources of resistance for this new biotype in order to initiate a breeding programme to develop resistant varieties. For this purpose, firstly it is necessary to study the nature of 'biotypic' variation of this pest in different locations of the country. Once the nature of the biotype is established, then screening of a large number of germplasm using the new predominant biotype can be undertaken.

Experiments were conducted in the screenhouse of Central Agricultural Research Institute, Gannoruwa. Eleven gall-midge populations were collected from different locations in six districts of the country (Table 1) in yala 89 and maha 89/90. They were multiplied on Bg 94-1 (susceptible variety) for one generation. A set of eight indicator varieties were selected to identify gall-midge biotypes (Table 1). The varieties were planted in seed boxes and when plants were 10 to 14 days old, they were infested with freshly emerged gravid females from each population (60 females/population). The infested plants were kept in a moist chamber to help the larvae to migrate into the plants. Three weeks after infestation the number of resistant plants for each variety was counted by dissecting the plants under a stereo-microscope. The resistant plants showed a dark discoloration at the base of the plants where the larvae had attempted to feed and subsequently died. The susceptible plants showed the presence of characteristic tubular gall formation.

Two rice varieties, ARC 6650 and IR 8 were totally susceptible and rice variety RP 1551 was totally resistant to GM population from all locations. Rice varieties CR 94-13, Ptb 18, MR 1523 and Ptb 21 showed more than 90% resistance to GM population from all locations. Previously resistant rice variety Bg 400-1 was susceptible in all locations except for Bombuwela GM population. In this location Bg 400-1 was moderately resistant.

This study confirms the earlier reports of the existence of a new biotype in the country and is virulent on previously resistant varieties like Bg 400-1. In all locations except Bombuwela, the new biotype was predominant. Bombuwela population of GM appears to contain a mixture of new and old biotypes. Rice varieties CR 94-13, MR 1523, RP 1551, Ptb 21 and Ptb 18 were resistant to this new biotype and may serve as donors of GM resistance. Genetic nature of resistance in these varieties needs to be investigated in order to determine whether these varieties have different genes of resistance. Use of genetically different genes of resistance in a resistant breeding programme would be an approach to slow down the evolution of new biotypes.

Table 1. Reaction of rice varieties to gall-midge populations collected from different locations

Location	Per cent resistant plants (mean of 4 replicates)						
	Variety						
	CR 94 — 13	Ptb 18	MR 1523	Bg 400 — 1	Ptb 21	IR 8	ARC 6650
Kandy District							
Barigama	96	100	94	0	100	0	*
Weligalla	100	98	100	0	100	0	100
Gannoruwa	100	100	100	0	100	0	100
Matale District							
Yatawara	100	94	100	0	96	0	100
Ukuwela	100	100	100	0	100	0	100
Kegalle District							
Kegalle	96	98	95	9	99	0	*
Gampaha District							
Mirigama	100	98	100	0	99	0	100
Kalutara District							
Bombuwela	100	96	100	67	100	0	100
Polonnaruwa District							
Polonnaruwa	100	100	100	0	100	0	100
Hingurakgoda	100	100	100	0	100	0	100
Kaduruwela	100	100	100	0	100	0	100

* Variety not tested

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