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Short Communication

Inheritance of powdery mildew resistance in fenugreek (*Trigonella foenum-graecum* L.)

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Powdery mildew of fenugreek (*Trigonella foenum-graecum* L.) is caused by *Erysiphe polygoni* DC. This disease causes heavy infection and results in heavy losses to the crop. The existing high yielding varieties are not having the built in resistance. In fenugreek, so far, there has been no report about the inheritance of powdery mildew resistance. However, there are few reports of screening fenugreek germplasm lines for resistance to powdery mildew [1,2]. Thus, in the present investigation an attempt has been made to determine the inheritance pattern of resistance to powdery mildew.

The experimental material consisted of the two parents (*viz.*, UM-305 and RMt-143), F_1 and F_2 of the cross *viz.*, UM-305 x RMt-143 and the check varities (RMt 1 and local check). The parent UM-305 is resistant to powdery mildew [3] whereas, the other parent *viz.*, RMt-143 and the check varieties (RMt-1 and local check) are susceptible to powdery mildew [4-7]. The experimental material was tested against powdery mildew during the *rabi* season in the years 1997-98 (experiment-I) and 1998-99 (experiment-II) under natural conditions. In the experitnent-I, parents, F_1 (*viz.*, UM-305 x RMt-143) and the check varities (*viz.*, RMt-1 and local check were grown in 2m single row plots with row to row and plant to plant distance of 30 cm and 10 cm, respectively. In the experiment-II, the parents, F_1 and F_2 of the cross (*viz.*, UM-305 x RMt-143) were grown with the check varieties (*viz.*, RMt-1 and local check) in RBD with two replications in the single row plots of 4m length with row to row and plant to plant distance of 30 cm and 10 cm, respectively. In both the experiments the check varieties RMt-1 and Local check were grown as spreader rows which served as source of secondary infection. At the time of evaluating individual plants of various generations for powdery mildew reaction, it was ensured that susceptible check varieties were showing 100% disease development. The idea behind this was to ensure that plants are classified into resistant and susceptible categories without any ambiguity. In both the experiments individual plants of parents, check varieties, F_1 generation and F_2 generation were critically evaluated for their reaction to powdery mildew and were classified as either powdery mildew susceptible or powdery mildew resistant plants. The plants in the resistant and susceptible categories were tagged individually for counting. Similar procedure of classification was also followed in case of powdery mildew of pea [8-10]

Disease reaction of the parents, check varieties and the F_1's and F_2's have been presented in Table 1. There was heavy incidence of powdery mildew in both the experiments as evident from the susceptible reaction of the check varieties, (*viz.*, RMt-1 and local check) which are reported to be susceptible varieties [4-7]. In both the experiments the plants of parent UM-305 showed resistance reaction whereas, plants of other parent i.e., RMt-143 and the F_1's showed susceptible reaction. Thus, reaction of parents and F_1's indicated that the susceptibility to powdery mildew was a dominant character- and resistance was the recessive character. Similar findings for powdery mildew resistance have been reported in pea [8-10].

In the experiment-II (i.e., in *rabi* 1998-99), F_2 plants showed segregation for susceptible and resistance reaction. The individual F_2 plant's reaction was noted and number of F_2 plants in each category were counted and totalled over the two replications. Chi-square test was applied to test the goodness of fit for assumed segregation ratio. In the F_2 generation there were 373 susceptible and 118 resistant plants (Table 1). This observed ratio of 373 susceptible : 118 resistant plants in F_2 is fitting at a high probability level to 3:1 monohybrid ratio. The calculated value of X^2 was non-significant which indicated that the data fits to a monohybrid ratio of 3 susceptible : 1 resistant. Thus, on the basis of resistance reaction of the parent UM-305, susceptible reaction of the parent RMt-143, susceptible reaction of F_1's and a perfect fit to a 3 susceptible : 1 resistant

Table 1. Reaction of parents F_1's and checks to powdery mildew and F_2 segregation ratio for reaction to powdery mildew

Genotype		Reaction to powdery mildew		Segregation ratio for reaction to powdery mildew in experiment-II (*rabi* 1998-99)	X^2 (3:1)
		Experiment-I (*rabi* 1997-98)	Experiment-II *rabi* 1998-99)		
Parents					
	UM-305	PMR[1]	PMR	-	-
	RMt-143	PMS[2]	PMS	-	-
Checks					
	RMt-1	PMS	PMS	-	-
	Local check	PMS	PMS	-	-
F_1					
	UM-305 x RMt-143	PMS	PMS	-	-
F_2					
	UM-305 x RMt-143	-	-	373 PMS : 118 PMR	0.1608 NS[3]

1. PMR : Powdery mildew resistant
2. PMS : Powdery mildew susceptible
3. NS : Non-significant at 5% PL

ratio in F_2, it can be concluded that susceptibility in RMt-143 is governed by single dominant gene and resistance to powdery mildew in UM-305 is governed by its recessive allele. The Similar findings of monogenic control of powdery mildew resistance have been reported in peas [8-11].

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