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Field evaluation of coriander genotypes against powdery mildew

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Abstract

India is the leading country in the world for the production and consumption of seed spices and is recognized as a land of spices. The major constraints for low productivity are several biotic stresses viz., powdery mildew, root rot, termite and other sucking pests. Among them powdery mildew is an important disease. The inherent disease resistance in the variety is the cheapest, the most effective as well as economic way of combating any disease. Therefore, a study was under taken to find out the source of resistance for powdery mildew (*Erysiphe polygoni* L.) under natural conditions. The experiment was conducted during *rabi* 2015-16 in augmented design. Total seventy nine promising entries of coriander received from Hisar, Kumarganj, Guntur, Dholi (40) and Jagudan (36) along with three checks *i.e.* G. Cori-2, APHU DHANIA-1 and RCr-728 were evaluated under ambient conditions. Among seventy nine different germplasms / varieties screened, none of the genotypes were found immune or resistant against powdery mildew disease. However at maturity stage of crop, the minimum per cent disease intensity was observed in DH-261 (13.3 %), whereas, maximum per cent disease intensity was observed in JCr-2013-6 (75.5 %).

Key words : Coriander, *Erysiphe polygoni* L., genotypes, resistance

India is one of the largest producer, consumer and exporter of seed spices (Peter *et al.*,2000). Coriander (*Coriandrum sativum* L.) is an important seed spice crop among the seed spices grown in India. It is herbaceous plant extensively grown in India almost in all states as spice. Coriander occupies first rank in production (1.72 lakhs MT) and second rank in area (2.82 lakhs ha) with an average productivity of 1639 kg ha^{-1}. Coriander crop is affected by number of diseases, out of which powdery mildew caused by *Erysiphe polygoni* L. is one of the most important disease (Dange *et al.*,1992) and has become a serious menace in recent past causing considerable yield loss up to 50 percent in absence of effective control measures. The inherent disease resistance in the variety is the cheapest, the most effective as well as economic way of combating any disease. Therefore, a study was under taken to find out the source of resistance for powdery mildew (*Erysiphe polygoni* L.) under natural conditions.

A field experiment was conducted during *rabi* 2015-16 at Seed Spices Research Station, S.D. Agril. University, Jagudan (Gujarat) in augmented design with a plant spacing of 30 cm × 10 cm (row to row and plant to plant). Seventy nine promising entries of coriander were evaluated under ambient conditions. All the recommended packages of practices including fertilizer management were adopted for raising the crop except disease management practices. The observations on the powdery mildew disease intensity were recorded from 20 randomly selected plants from each plot using 0-4 scale as; 0.0= Healthy, 1.0= whitish small spots on the leaf, 2.0= whitish growth covering the entire leaf, 3.0=growth on leaf and stem and 4.0= growth on leaf, stem and umbel (Anon., 2004).

Based on these observations, per cent disease intensity (PDI) of the disease was worked out by using formula given by Mckinney (1923) and rated as no disease, highly resistant-HR, up to 10%, Resistant- R, 10-25%, Moderately resistant-MR, 25-50%, Susceptible-S, (more than 50%, Highly susceptible HS.

Seventy nine coriander genotypes were screened for powdery mildew disease reaction. Powdery mildew PDI recorded are presented in Table 1. The genotypes were grouped into 5 categories by considering the disease PDI score (Table 2). Out of the seventy nine genotypes screened, thirty two genotypes were moderately resistant, thirty genotypes were susceptible and seventeen were highly susceptible and none of them showed immune or resistant reaction. Variation in degree of resistance among different varieties or genotypes of coriander against powdery mildew has also been reported by Kalra *et al.*, (1995), Keshwal and Khatri (1998), Kalra *et al.*, (2003), Patel *et al.*, (2008), Bandela *et al.*, (2014) and Singh and Rao (2016).This slow mildewing character could be studied in detailed and will be utilized in further breeding programme.

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Table 1. Disease reaction of coriander genotypes against powdery mildew under field conditions

S. No.	Genotypes	Powdery mildew PDI	Resistance reaction	Sr.	Genotypes	Powdery mildew PDI	Resistance reaction
1	G Cori-2	21.0	MR	41	RD-417	22.3	MR
2	DH-261	**13.3**	MR	42	APHU DHANIA-1	22.2	MR
3	DH-268	15.5	MR	43	JCr-2013-3	72.1	HS
4	DH-275	14.8	MR	44	JCr-2013-6	**75.5**	HS
5	DH-276	25.3	S	45	JCr-2013-14	65.3	HS
6	DH-277	28.9	S	46	JCr-2013-15	62.0	HS
7	DH-278	34.8	S	47	JCr-2013-16	58.3	HS
8	DH-279	22.3	MR	48	JCr-2013-18	60.0	HS
9	DH-280	15.4	MR	49	JCr-2013-20	60.4	HS
10	DH-281	20.4	MR	50	JCr-2013-23	55.3	HS
11	DH-283	22.9	MR	51	JCr-2013-24	62.6	HS
12	NDCor 90	21.3	MR	52	COR-95	58.6	HS
13	NDCor 94	25.5	S	53	COR-96	45.9	S
14	NDCor 102	18.9	MR	54	COR-97	52.6	HS
15	NDCor 106	28.4	S	55	COR-98	46.8	S
16	NDCor 109	19.3	MR	56	COR-99	58.0	HS
17	NDCor 110	26.7	S	57	COR-100	62.3	HS
18	NDCor 111	31.3	S	58	COR-101	50.4	HS
19	NDCor 118	23.1	MR	59	COR-102	65.2	HS
20	NDCor 119	28.3	S	60	COR-106	45.9	S
21	NDCor 120	33.2	S	61	COR-107	30.3	S
22	LCC-226	31.3	S	62	COR-108	40.6	S
23	LCC-229	35.1	S	63	COR-109	52.7	HS
24	LCC-230	25.7	S	64	COR-110	55.9	HS
25	LCC-231	28.4	S	65	COR-111	19.0	MR
26	LCC-233	28.9	S	66	COR-112	21.3	MR
27	LCC-234	31.2	S	67	COR-113	30.5	S
28	LCC-241	28.4	S	68	COR-114	32.9	S
29	LCC-244	23.3	MR	69	COR-115	30.7	S
30	LCC-247	21.2	MR	70	J.Cr.283	45.8	S
31	LCC-250	18.7	MR	71	J.Cr.327	42.3	S
32	RD-154	17.3	MR	72	J.Cr.333	38.5	S
33	RD-365	15.4	MR	73	J.Cr.342	32.4	S
34	RD-377	20.3	MR	74	J.Cr.375	30.3	S
35	RD-385	14.2	MR	75	J.Cr.380	28.7	S
36	RD-388	19.3	MR	76	J.Cr.383	22.9	MR
37	RD-393	22.8	MR	77	J.Cr.390	17.9	MR
38	RD-397	15.6	MR	78	J.Cr.400	21.3	MR
39	RD-401	17.8	MR	79	RCr-728	20.8	MR
40	RD-416	24.5	MR				

(R- Resistant; MR - Moderately Resistant; S - Susceptible; HS-Highly Susceptible)

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