



Reviewed by

Dr. R.D. Meena,
ICAR-National Research Centre on
Seed Spices, Tabiji, Ajmer, Rajasthan,
India.
Email: meenard2005@gmail.com

***Correspondence**

Kedar Nath
drkdkushwaha@nau.in

Received: 05 March 2024

Revision: 26 March 2024

Accepted: 22 April 2024

Citation

Patel, D.N., Nath, Kedar, Bala, Madhu,
Patel, R.K. and Kumawat, G.L. 2022.
Evaluation of coriander (*Coriandrum
sativum* L.) genotypes against powdery
mildew disease incited by *Erysiphe
polygoni* DC. *Int. J Seed Spice*, 12 (2): 7-
14

DOI

<https://doi.org/10.56093/IJSS.v92i1.2>

Affiliation

¹Department of Plant Pathology, N. M.
College of Agriculture, Navsari
Agricultural University, Navsari -396450,
Gujarat, India

²Regional Rice Research Station,
Navsari, Agricultural University, Vyara-
394650, Gujarat, India

³Department of Genetics and Plant
Breeding, N. M. College of Agriculture,
Navsari Agricultural University, Navsari-
396450, Gujarat, India

⁴ICAR-All India Coordinated Research
Project on Spices, Department of Plant
Breeding & Genetics, Sri Karan
Narendra Agriculture University, Jobner,
Rajasthan, India

Evaluation of coriander (*Coriandrum sativum* L.) genotypes against powdery mildew disease incited by *Erysiphe polygoni* DC

Darshan N. Patel¹, Kedar Nath^{2*}, Madhu Bala³, R.K. Patel³ and G.L. Kumawat⁴

Abstract

Under field conditions, 38 coriander genotypes were screened against powdery mildew disease during *Rabi* 2021-22. Out of these none of the genotype was found free from disease. Coriander genotype NCOR-124 had the lowest intensity of the disease by 32.69%, while which was at par with genotype NCOR-122 (33.11%). In the context of the disease reaction, none of the genotypes showed a resistant reaction; only two genotypes, NCOR-124 and NCOR-122, were found moderately resistant, and six genotypes, COR-129, COR-132, COR-15, Rcr-475, Rcr-480, and Rcr-684, were found susceptible to powdery mildew disease under field conditions. Early flowering was observed in genotypes NCOR-124 and NCOR-122, which initiated at 38 and 39 days after sowing (DAS), respectively. Similarly, early maturity was also observed in both the genotypes at 87 and 88 DAS, respectively. At the same time, late flowering was observed in genotype NCL-13 and Rcr-475 at 57 DAS, while late maturity was observed in variety Rcr-684 at 104 DAS. The leaf area of the genotypes recorded ranged from 2.34 to 7.12 cm². The highest leaf area of 7.12 cm² was recorded in genotype NCOR-144 and lowest leaf area of 2.34 cm² was recorded in genotype Hissar Anand. Maximum plant height (75.34 cm) was measured in genotype GDLC-1, while it was lowest (49.43 cm) in genotype NCOR-103. Genotypic correlation analysis of various morphological characters against powdery mildew disease intensity showed a highly significant positive correlation between maturity ($r = 0.529$), plant height ($r = 0.492$), and flower initiation ($r = 0.317$), but no significant negative correlation was observed with leaf area ($r = -0.079$). It has also been identified that genotypes that showed characteristics of early maturity had a resistant response.

Keywords: Coriander, genotypes, powdery mildew, disease, intensity, resistant.

Introduction

Coriander (*Coriandrum sativum* L.) which belongs to the family *Apiaceae* (*Umbelliferae*) is glabrous, aromatic, herbaceous, annual herb (Duke *et al.*, 2002). The “coriander”, is consequential from Greek word for “bed-bug”, as smell of spanking new foliage is said to resemble that of bug plague-ridden bed line (Nadeem *et al.*, 2013). It is also referred as “kusthumbari” or “dhanayaka” in various Sanskrit literature (Prakash, 1990). Egyptians call this herb as “spice of happiness” (Verma *et al.*, 2011). Coriander is indigenous to the Mediterranean region and mainly cultivated in Russia, Central Europe, North Africa and Asia (Singh *et al.*, 2006). The plant is best grown between October and February. In early stage of growth, the plant requires a cool climate and a warm weather at later maturity stage (Sahib *et al.*, 2012). It grows best in dry climates as well as subtropical conditions; however, it can grow in any type of soil like light, well drained, moist, loamy soil, and light to heavy black soil (Verma *et al.*, 2011).

The coriander is used for double purpose as fresh leaves and seeds, fresh leaves contain 87.90 per cent moisture, 3.30 per cent protein, 6.50 per cent carbohydrates, 1.70 per cent total ash, 0.14 per cent calcium, 0.06 per cent phosphorus, 0.01 per cent iron, 60 mg 100g⁻¹ vitamin B2, 0.8 mg 100g⁻¹ niacin, 135 mg 100g⁻¹ vitamin C and 10,460 IU 100 g⁻¹ vitamin A (Nadeem *et al.*, 2013). Coriander seeds also contain an essential oil by 0.03 to 2.6 per cent (Chahal *et al.*, 2018). All parts of this herb are in use as flavouring agent and/or as traditional remedies for the treatment of different disorders in the folk medicine systems of different civilizations (Sahib *et al.*, 2012). It is a highly reputed Ayurvedic medicinal plant commonly known as “Dhaniya” in India. Coriander has been reported to exhibit several pharmacological effects such as antioxidant activity, anti-diabetic activity, anti-mutagenic activity, anthelmintic activity, sedative-hypnotic activity, anticonvulsant activity, diuretic activity, cholesterol lowering activity, protective role against lead toxicity, antifungal activity, anti-feeding activity, anticancer activity, anxiolytic activity, hepatoprotective activity, anti-protozoal activity, anti-ulcer activity, post-coital anti-fertility activity and heavy

metal detoxification (Momin *et al.*, 2012). The green leaves of coriander are known as "Asotu" in the Eastern Anatolian region or "Cilantro" in the United States, and are consumed as fresh herb (Bhuiyan *et al.*, 2009; Mahendra and Bisht, 2011). Fresh juice of coriander is extremely advantageous in curing many deficiencies related to vitamins and iron. (Bhat *et al.*, 2014). Fresh leaves can be eaten as such because of various health benefits however, if it is not harvested freshly seeds mature and ripen in late summer developing delicate aroma which are then used as dried spice. India is the biggest producer, consumer and exporter of coriander in the world (Bhat *et al.*, 2014). The exports have increased significantly in the past few years due to strong demand from overseas market. Total area of production of coriander in India in the year 2021-22 was 5.83 lakh ha with total production of 7.35 lakh tones and yield was 1329.28 kg ha⁻¹. While in Gujarat total area was 1.26 lakh ha with total production of 1.88 lakh tones and yield was 1496.38 kg ha⁻¹ has second larger producing state in country (Anon.,2023). The major states where coriander is cultivated on a large scale include Rajasthan, Madhya Pradesh, Gujarat, Uttar Pradesh, Andhra Pradesh, Karnataka, and Tamil Nadu.

Coriander, an essential spice crop, is susceptible to several biotic and abiotic factors that adversely influence the crop yield. In biotic factors, several fungal, bacteria and viruses diseases are associated. Powdery mildew, caused by *Erysiphe polygoni* DC, is a significant disease that has been a major problem in the past few decades (Dange *et al.*, 1992). It can lead to a significant reduction in crop production, up to 50 percent, if not effectively controlled (Amin *et al.*, 2017). Srivastava (1972) reported 15-20 per cent yield losses in coriander due to powdery mildew disease. *Erysiphe polygoni* DC causes powdery mildew disease in many crops namely, coriander (Khare *et al.*, 2017), fenugreek (Acharya *et al.*, 2014), cumin (Khare *et al.*, 2014), cowpea (Jhooty *et al.*, 1985), mungbean and uradbean (Thakur and Agrawal, 1995), to significantly reduce crop yield. Powdery mildew is most frequently found on the upper side of leaves, although it can also be found on the underside of leaves, young shoots and stems,

buds, blooms, as well as young fruits (Agrios, 2005; Suleman *et al.*, 2016). Powdery mildew disease appears in February-March as favoured by dry conditions with warmer days. Powdery white masses are observed sprinkled on the foliage and tender plant parts, which cover the whole foliage and plant parts. The leaves turn yellow then brown. When the disease appears, early seed is not produced, but in case of late infection, some seeds are formed, but most of them remain small in size (Khare *et al.*, 2017). Powdery mildew (*Erysiphe polygoni* DC) disease in coriander occurring in severe form in South Gujarat region and cause huge losses in yield and quality seeds.

In order to manage the powdery mildew of coriander, resistant varieties serve as an eco-friendly approach. Resistant varieties offer the cheapest means of disease management and reduce environmental pollution and the effectiveness of resistant varieties is not affected by environmental conditions. It also reduces the use of toxic chemicals. Thus, it is the most remunerative to farmers. Therefore, an experiment on identification of resistant sources of coriander against powdery mildew disease was carried out.

Material and methods

An experiment was conducted at Research Farm, N. M. College of Agriculture, N.A.U, Navsari (GPS position: 20° 55' 48.5" N 72° 53' 30.6" E) during the *Rabi* season -2021-22. Total 38 different coriander genotypes along with resistant and susceptible check were evaluated against the powdery mildew disease. An experiment was arranged in Randomized Block Design with two replication each having 3m row length with 45×15 cm spacing. Seeds of each genotype were sown on December 11, 2022 and immediately irrigation was given after sowing to get better germination. All the recommended packages of practices including fertilizer management were adopted for raising the crop except disease management practices. Total dose of P₂O₅ and 50 per cent dose of N₂ was given as basal application and remaining 50 percent dose of N₂ was given at pre-flowering stages. A total of 20 plants of each genotype in each replication were maintained by a thinning operation done at 25 DAS to maintain the optimum

plant population. A total of five irrigations at 15-day intervals were given at different crop growth stages and according to crop needs. Similarly, the inter-culture operation was done at 35 DAS. Total two weeding operations were done at 20 and 55 DAS to keep the field free from weeds. A spray of insecticide profenofos 40% + cypermethrin 4% @ 2 ml l⁻¹ was done to prevent the damage from aphid. The harvesting was done according on maturity of each genotype.

Inoculation

Powdery mildew-infected fresh plant samples were collected from the Experiment at Genetics and Plant Breeding, Research Farm, N. M. College of Agriculture, N.A.U., Navsari. Spores were collected by using a sterilized camel brush by tapping the leaf in sterile distilled water. Suspension containing spores (106 ml⁻¹) of powdery mildew causing pathogen were sprayed on the coriander genotypes at 30 days after sowing with the help of an automizer. The reaction of the genotypes for powdery mildew incidence was recorded after 8 days of the appearance of the disease. Disease intensity of coriander powdery mildew was recorded from 10 randomly selected plants and 9 leaves from each plant. Morphological characters like leaf area, date of first flowering, plant height and maturity were recorded of 10 randomly selected plants and correlated with disease intensity. Leaf area was measured by the Leaf scan application (version 2.1.1). Photographs of morphological characters of the most susceptible and most tolerant genotypes were taken. Disease scoring was done using 0-4 scale (Anon., 2004) as 0.0- healthy, 1.0- Whitish small spots on the leaf, 2.0- Whitish growth covering the entire leaf, 3.0- Whitish growth on leaf and stem, 4.0- Whitish growth on leaf, stem and umbel and described in fig 1.

Disease intensity was calculated by using the following formula (Hudge and Datar, 2010)

$$\text{Disease Intensity (\%)} = \frac{\text{Sum of all numerical ratings}}{\text{Total no. of leaf observed} \times \text{max. disease grade}} \times 100$$

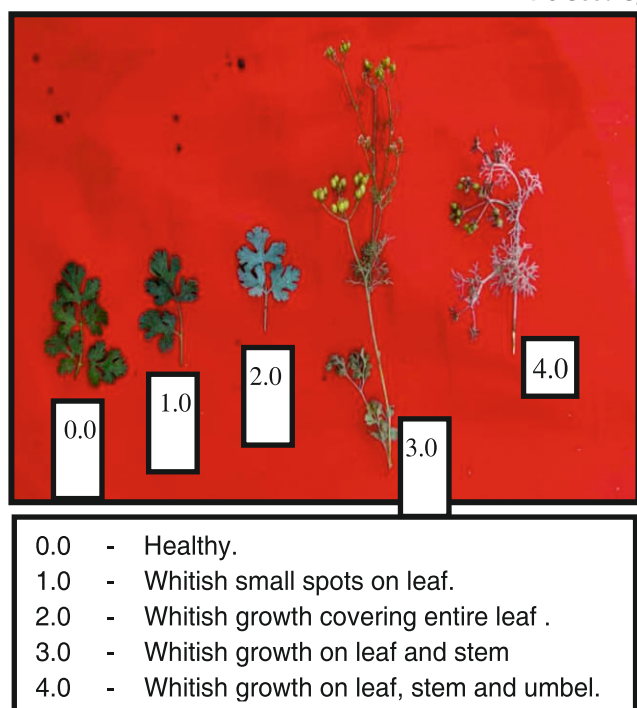


Fig. 1 Disease rating scale for powdery mildew of Coriander

Based on above observations, per cent disease intensity was calculated and categorized under different disease reactions described by Datar and Mayee, 1981 mentioned in following table 1.

Table1. Disease reaction of coriander genotypes on the basis of disease intensity

Sr. No.	Disease intensity (%)	Disease reaction
1	0	Immune
2	1 - 20	Resistant
3	21 - 40	Moderately Resistant
4	41 - 60	Susceptible
5	>60	Highly susceptible

Results and Discussion

Disease intensity of coriander genotypes

Screening of total 38 promising genotypes including checks against powdery mildew disease is essential to find out the potential resistance source under field

conditions. An experiment was conducted at Research Farm, N. M. College of Agriculture Farm during the *Rabi* season 2021-22. The experiment results showed that disease intensity was recorded in range from 32.69 to 87.42 per cent. Minimum disease intensity was found in NCOR-124 (32.69%) which was at par with NCOR-122 (33.11%). The genotype RCr-684 showed susceptible reaction with 52.28 per cent disease intensity followed by Rcr-475 (53.25%), COR-156 (53.81%), COR-129 (54.50%), and Rcr-480 (55.06%) and NCOR-146 (59.64%). Highest disease intensity was recorded in NCOR-156 with 87.42 per cent (Table 2). Disease reaction of the coriander genotypes against powdery mildew exhibited that among the 38 genotypes, none of the genotype showed immune reaction or resistant reaction. Only 2 genotypes NCOR-124 and NCOR-122 showed moderately resistant; 6 genotypes viz., Rcr-684, Rcr-475, COR-156, COR-129, Rcr-480 and NCOR-146 exhibited susceptible reaction; 30 genotypes were found highly susceptible. Variation in degree of resistance among different genotypes of coriander has also been reported by several earlier workers like; Kalra *et al.* (1995) observed minimum seed yield reduction in early maturity cultivar as compared to late maturity cultivars of coriander. Earlier similar work also supporting present finding as out of 25 genotypes none of the genotype of coriander was found resistant (Sraavanthi *et al.*, 2014). Another finding showed that total twelve genotypes of coriander were screened against powdery mildew disease out of them only one genotype, COR-31 showed moderate resistance reaction observed by Singh and Rao (2016). Amin *et al.* (2017) evaluated 79 genotypes of coriander against powdery mildew disease and they revealed that. none of the genotype showed resistance reaction, while thirty two genotypes were moderately resistant, thirty genotypes were susceptible and seventeen were highly susceptible. Kashyap *et al.* (2020) reported that 4 genotypes out of 15 were found resistant; about 10 genotypes were moderate resistant while one genotype was found susceptible. None of the genotypes were immune. Kumawat *et al.* (2021) found that 7 genotypes were moderately resistant, 31 genotypes were susceptible while 90

genotypes were found highly susceptible and none of the genotype were free from disease out 128 screened genotypes.

Morphological characteristics of various genotypes and correlation with disease intensity

Different coriander genotypes were characterized for plant height, leaf area, initiation of flowering and day to maturity. Data of plant height revealed that a significant difference was observed between the treatments to plant height. Plant height in different genotypes were recorded and ranged between 49.43-75.34 cm. Highest plant height was observed in genotype GDLC-1 by 75.34 cm which was at par with genotype GC-2, GC-3, Rcr-41, Rcr-480, NCOR-149, Rcr-446, NCOR-143 and Rcr-435 with 71.27, 69.84, 69.25, 68.60, 68.44, 68.40, 68.25 and 67.94 cm, respectively. Lowest plant height (49.43 cm) was observed in genotype NCOR-103 followed by genotype NCOR-124, NCOR-132, NCOR-122 and NCOR-142 by 52.58, 53.31, 53.33 and 53.81cm (Table 2). Leaf area of different genotypes were found statistically different among the all genotypes. In all genotypes leaf area was observed in range between 2.34 to 7.12 cm². Highest leaf area 7.12 cm² was recorded in genotype NCOR-144 which was at par with genotype Rcr-475, Rcr-446, NCOR-132 and NCOR-105 by 7.02, 6.86, 6.86 and 6.55 cm², respectively. Lowest 2.34 cm² leaf area was observed in genotype Hissar Anand and NCOR-103 by 2.88 cm² (Table 2). Initiation of flowering data revealed that early flowering was recorded in the genotypes NCOR-124 at 38 DAS followed by NCOR-122 and NCOR-136 at 39 and 40 DAS, respectively. While in late flowering at 57 DAS was recorded in genotypes, NCL-12 and Rcr-475. Similarly, early maturity was recorded in genotypes NCOR-124 at 87 DAS followed by NCOR-122 and NCOR-144 with 88 and 90 DAS, respectively. Maximum maturity days was taken to by the genotypes Rcr-684 (104) followed by genotype Rcr-435, Rcr-436 and Rcr-728 matured in 102 days (Table 2).

Correlation coefficient analysis of disease intensity was done for various morphological characters viz., plant height, leaf area, days to initiation flowering and day to maturity. Data presented in Table 3 revealed that there was a highly positive correlation between disease intensity and days of flowering initiation ($r = 0.32$), days of maturity ($r = 0.53$) and plant height

($r = 0.49$) and a negative significant correlation was observed between disease intensity and leaf area ($r = -0.08$). These results indicated that the plants that had early flowering, early maturity, and lower plant height had less disease incidence. This was in agreement with several workers; Kalra *et al.* (1995) observed minimum seed yield reduction was recorded in early maturing cultivars as compared to late maturing cultivars. Korra and Kumar (2018) observed a positive correlation between powdery mildew disease and crop age (maturity) in black gram.

Summary

Screening of 38 genotypes of coriander was done against powdery mildew disease, and it was found that the minimum disease intensity was observed in the genotype NCOR-124, which was at par with NCOR-122 by 32.69 and 33.11 per cent, respectively. These genotypes also showed early flowering and early maturity behavior that may escape the disease and exhibit moderately resistant reactions. At the same time, the disease was highest recorded in genotype NCOR-156 by 87.42 percent and showed a highly susceptible reaction. Out of these genotypes, none of the genotypes showed a resistant reaction; only 6 genotypes, viz., COR-129, COR-132, COR-156, Rcr-475, Rcr-480 and Rcr-684 were found susceptible and rest of the genotypes exhibited highly susceptible reaction against powdery mildew disease under field conditions. Maximum plant height (75.34 cm) was measured in genotype GDLC-1, while it was lowest (49.43 cm) in genotype NCOR-103. Whereas the highest leaf area 7.12 cm² was recorded in genotype NCOR-144 and lowest 2.34 cm² was recorded in genotype HissarAnand. Highly significant positive correlation between maturity ($r = 0.529$), plant height ($r = 0.492$) and flower initiation ($r = 0.317$) was recorded for disease severity, While non significant negative correlation was observed with leaf area ($r = -0.079$). From these findings, it is clear that early maturity genotypes NCOR-124 and NCOR-122 showed minimum disease intensity, which may be due to the earliness of genotypes, and it also observed that little plant and pinnate type of leaf showed less disease intensity.

Table 2. Screening of coriander genotypes against powdery mildew disease under artificial inoculated field conditions and its characteristics during *Rabi* 2021-22 season.

Sr. no.	Genotype	**Disease Intensity(%)	Disease reaction	Plant height (cm)	Leaf area (cm²)	DFI	DM
1	NCOR-101	70.06 ^{gh}	HS	57.63 ^{hijklmn}	4.07 ^{ijklm}	42	92
2	NCOR-102	68.39 ^h	HS	62.72 ^{bcdefghijk}	4.97 ^{fgh}	54	94
3	NCOR-103	77.00 ^{def}	HS	49.43 ⁿ	2.88 ^{op}	44	95
4	NCOR-105	70.75 ^{gh}	HS	56.91 ^{hijklmn}	6.55 ^{abc}	43	94
5	NCOR-108	77.56 ^{cdef}	HS	61.09 ^{defghijklm}	4.3 ^{hijkl}	47	98
6	NCOR-111	73.39 ^{fgh}	HS	59.56 ^{fghijklm}	4.85 ^{ghi}	49	96
7	NCOR-118	81.03 ^{bcde}	HS	57.37 ^{hijklmn}	3.38 ^{mno}	43	100
8	NCOR-119	70.75 ^{gh}	HS	58.49 ^{ghijklmn}	3.99 ^{jklmn}	44	96
9	NCOR-122	33.11 ^k	MR	53.33 ^{lmn}	3.82 ^{klmn}	39	88
10	NCOR-124	32.69 ^k	MR	52.58 ^{mn}	3.22 ^{no}	38	87
11	NCOR-132	72.69 ^{fgh}	HS	55.48 ^{ijklmn}	6.86 ^{ab}	42	92
12	NCOR-136	67.97 ^h	HS	56.77 ^{hijklmn}	4.82 ^{ghi}	40	92
13	NCOR-142	73.25 ^{fgh}	HS	53.81 ^{klmn}	5.66 ^{def}	42	94
14	NCOR-143	83.81 ^{abc}	HS	68.25 ^{abcdef}	5.61 ^{def}	45	97
15	NCOR-144	70.33 ^{gh}	HS	64.67 ^{bcdefghi}	7.12 ^a	41	90
16	NCOR-145	86.72 ^{ab}	HS	70.65 ^{abc}	5.64 ^{def}	52	97
17	NCOR-146	59.64 ⁱ	HS	62.34 ^{bcdefghijkl}	4.37 ^{ghijk}	42	92
18	NCOR-148	82.14 ^{abcd}	HS	62.9 ^{bcdefghijk}	4.5 ^{ghijk}	43	99
19	NCOR-149	83.25 ^{abcd}	HS	68.44 ^{abcdef}	3.43 ^{mno}	47	98
20	NCOR-156	87.42 ^a	HS	67.6 ^{abcdefg}	3.92 ^{jklmn}	48	100
21	COR-129	54.5 ^{ij}	S	61.99 ^{cdefghijkl}	4.17 ^{hijklm}	41	95
22	COR-132	56.17 ^{ij}	S	53.31 ^{lmn}	3.5 ^{lmno}	42	95
23	COR-156	53.81 ^{ij}	S	57.92 ^{hijklmn}	3.47 ^{mno}	42	93
24	NLC-12	82.97 ^{abcd}	HS	64.24 ^{bcdefghij}	4.17 ^{hijklm}	57	98
25	NLC-13	74.92 ^{fg}	HS	57.78 ^{hijklmn}	4.37 ^{ghijk}	53	97
26	Rcr-20	81.86 ^{abcd}	HS	61.52 ^{cdefghijklm}	4.48 ^{ghijk}	51	95

27	Rcr-41	68.39 ^h	HS	69.25 ^{abcde}	4.11 ^{ijklm}	42	95
28	Rcr-435	77.00 ^{def}	HS	67.94 ^{abcdef}	3.22 ^{no}	42	102
29	Rcr-436	75.47 ^{efg}	HS	65.73 ^{bcdefgh}	4.66 ^{ghij}	41	102
30	Rcr-446	67.56 ^h	HS	68.4 ^{abcdef}	6.86 ^{ab}	54	97
31	Rcr-475	53.25 ^j	S	60.48 ^{efghijklm}	7.02 ^{ab}	57	100
32	Rcr-480	55.06 ^{ij}	S	68.6 ^{abcdef}	5.88 ^{cde}	49	96
33	Rcr-684	52.28 ^j	S	55.08 ^{ijklmn}	6.32 ^{bcd}	53	104
34	RCR-728 (NC)	82.69 ^{abcd}	HS	54.57 ^{klmn}	4.58 ^{ghijk}	50	102
35	HissarAnand (NC)	82 ^{abcd}	HS	65.33 ^{bcdefgh}	2.34 ^p	49	95
36	GC-3 (SC)	81.86 ^{abcd}	HS	69.84 ^{abcd}	4.13 ^{ijklm}	50	94
37	GDLC-1(SC)	84.36 ^{ab}	HS	75.34 ^a	3.76 ^{klmn}	44	96
38	GC-2(SC)	83.25 ^{abcd}	HS	71.27 ^{ab}	5.13 ^{efg}	49	98
	S. E.m ±	1.25	-	2.66	2.66	-	-
	C.D (5%)	3.60	-	7.66	7.66	-	-
	C.V %	3.06	-	6.01	6.01	-	-

All the data are mean of two replication **Note: Significant data in reverse order

DFI: Days of flowering initiation, DM: Days of maturity

Table 3. Genotypic correlation analysis of coriander genotype and powdery milder disease intensity

	DOF	DOM	Leaf area	Plant height
DOM	0.566 ^{**}			
Leaf area	0.305 ^{**}	0.07 ^{NS}		
Plant height	0.307 ^{**}	0.295 ^{**}	0.050 ^{NS}	
PDI	0.317 ^{**}	0.529 ^{**}	-0.079 ^{NS}	0.492 ^{**}

DOF- Days of flowering initiation, DOM- Days of maturity,

PDI- Percent disease intensity, NS- Non significant

Acknowledgement

We are thankful to the Director of Research and Dean PG Studies, Navsari Agricultural University, Navsari, for approving the research work and granting us the

resources we needed. We would also like to thank the Principal of the N. M. College of Agriculture for permitting us to use farm facilities for the experiment. In addition, we want to thank Dr. K. B. Rakholiya, Professor and Head, Dept. of Plant Pathology, N. M. College of Agriculture, Navsari, for helping us with our study by giving us technical advice.

Author's Contributions: Darshan kumar, N. Patel and Kedar Nath, both authors, designed an experiment, prepared the materials and conducted the experiment. Darshan kumar N. Patel and Kedar Nath evaluated the data, performed the statistical analysis, and wrote the manuscript. Madhu Bala, R.K. Patel and G.L. Kumawat gave the idea for the research and the coriander genotypes seeds. All of the authors read and approved the final manuscript.

Conflict of interest: The authors declare no conflict of interest.

References

- Acharya, K., Chakraborty, N., Chatterjee, S. and Basu, S.K. 2014. Fungal diseases of fenugreek. *American J Social Iss. Hum., ISSN, 2276-6928*.
- Agrios, G.N. 2005. Plant Pathology Vth edition Elsevier's Science and Technology, Oxford, Academic Press Publications, U.K. pp – 448.
- Amin, A.M., Patel, N.R., Prajapati, B.G. and Patel, D.G. 2017. Field evaluation of coriander genotypes against powdery mildew. *Int. J Seed Spice., 7(1):86-88*.
- Anonymous, 2004. Procedure for grading disease and pest Severity of various pests and diseases in seed Spices. Proceedings of the XVII workshop of All India Coordinated Research Project (AICRP) on Spices, Kozhikode, Kerala, 3–5 February.
- Anonymous, 2023. Major Spice wise area and production of spices. <https://www.indianspices.com/sites/default/files/Major%20spice%20state%20wise%20area%20production%202022-23.pdf>
- Bhat, S., Kaushal, P., Kaur, M. and Sharma, H.K. 2014. Coriander (*Coriandrum sativum* L.): Processing, nutritional and functional aspects. *African J Plant Sci., 8(1):25-33*.
- Bhuiyan, M.N.I., Begum, J. and Sultana, M. 2009. Chemical composition of leaf and seed essential oil of *Coriandrum sativum* L. from Bangladesh. *Bangladesh J Pharm., 4(2):150-153*.
- Chahal, K.K., Singh, R., Kumar, A. and Bhardwaj, U. 2018. Chemical composition and biological activity of *Coriandrum sativum* L.: A review. *Ind. J Nat. Prod. Resour., 8(3):193-203*.
- Dange, S.R.S., Pandey, R.N. and Shava, R.L. 1992. Disease of cumin and their management. *Agric. Rev., 13(4):219-224*.
- Datar, V.V. and Mayee, C.D. 1981. Assessment of losses in tomato yield due to early blight. *Indian Phytopathol., 34:191-195*.
- Duke, J.A., Bogenschutz-Godwin, M.J., duCellier, J. and Duke, P.A.K. 2002. Handbook of medicinal herbs, (2nd edition). CRC Press, Boca Raton, 609-610.
- Hudge, B.V. and Datar, V.V. 2010. Study of incidence and severity of leaf spot disease in *Jatropha curcas* L. *Int. J Agric. Sci., 6(1):355-356*.
- Jhooty, J.S., G.D. Munshi and Sokhi, S.S. 1985. Resistance to powdery mildew in cowpea germplasm. *Ind. J Mycol. Plant Pathol., 15(2):202-203*.
- Kalra, A., Parameswaran, T.N., Ravindra, N.S. and Dimri, B.P. 1995. Effect of powdery mildew (*Erysiphe polygoni*) on yields and yield components of early and late maturing coriander (*Coriandrum sativum*). *J Agric. Sci., 125(3):395-398*.
- Kalra, A., Parameswaran, T.N., Ravindra, N.S., Rao, M.G. and Kumar, S. 2000. Effects of planting date and dinocap applications on the control of powdery mildew and yields of seed and seed oil in coriander. *J Agric. Sci., 135(2):193-197*.
- Kashyap, R.P., Nag, U.K. and Dewangan, M. 2020. Evaluation of cultivars against powdery mildew disease (*Erysiphe polygoni* DC) of coriander (*Coriandrum sativum* L.) *J. Pharmacogn. Phytochem., 9(3):1230-1232*.
- Khare, M.N., Tiwari, S.P. and Sharma, Y.K. 2014. Disease problems in the cultivation of I. Cumin (*Cuminum cyminum* L.) II. Caraway (*Carum carvi* L.) and their management leading to the production of high quality pathogen free seed. *Int. J Seed Spices., 4(1):1-8*.
- Khare, M.N., Tiwari, S.P. and Sharma, Y.K. 2017. Disease problems in the cultivation of coriander (*Coriandrum sativum* L.) and their management leading to production of high quality pathogen free seed. *Int. J Seed Spice., 7(1):1-7*.
- Korra, T. and Kumar, V.M. 2018. Survey for the Occurrence of Powdery Mildew and It's Effect of Weather Factors on Severity of Powdery Mildew in Guntur District. *Int. J Curr. Microbiol. App. Sci., 7(11):949-964*.
- Kumawat, G.L., Gothwal, D.K., Kunwar, R., Shivran, A.C., Kumawat, P. and Meena, A.K. 2021.

- Screening of powdery mildew (*Erysiphe polygoni* DC.) tolerance in coriander (*Coriandrum sativum* L.) germplasm. *J Pharm. Innov.*, 10(4):1112-1116.
- Mahendra, P. and Bisht, S. 2011. *Coriandrum sativum*: A Daily Use Spice with Great Medicinal Effect. *Pharma. cognosy J.* <https://doi.org/10.5530/pj.2011.21.16>.
- Momin, A.H., Acharya, S.S. and Gajjar, A.V. 2012. *Coriandrum sativum*-review of advances in phytopharmacology. *Int. J Pharma. Sci. Res.*, 3(5):1233.
- Nadeem, M., Anjum, F.M., Khan, M.I., Tehseen, S., El-Ghorab, A. and Sultan, J.I. 2013. Nutritional and medicinal aspects of coriander (*Coriandrum sativum* L.): A review. *J British Food.*, 115(5):743-755.
- Prakash, V. 1990. Leafy Spices, CRC Press Inc., Boca Raton, FL, pp. 31-32.
- Sahib N.G., Anwar, F., Gilani, A.H., Hamid, A.A., Saari, A. and Alkharfy, K.M. 2012. Coriander (*Coriandrum sativum* L.): A potential source of high-value Components for functional foods and nutraceuticals- A Review. *Phytother. Res.*, 27(9), doi10.1002/ptr.4897.
- Singh, A.K. 2006. Evaluation of fungicides for the control of powdery mildew disease in coriander (*Coriandrum sativum* L.). *J Spices Arom. Crop.*, 15(2):123-124.
- Singh, A. K. and Rao, S. S. 2016. Evaluation of coriander germplasm for yield and powdery mildew resistance. *J Spices Arom. Crop.*, 25(1): 70-72.
- Sravanthi, B., Swamy, N., Umesha, B.S. and Reddy, B.R. 2014. Screening of Coriander Genotypes for Powdery Mildew Disease Resistance. *Int. J App. Biol. pharm.*, 5(1):139-141.
- Srivastava, U.S. 1972. Edaphic factors and wilt of coriander. *Ind. phytopathol.* 24:679-83.
- Suleiman, H., Hayatu, M., and Kutama, A.S. 2016. Effects of temperature on the germination, sporulation, and *in vivo* infection of *Sphaerotheca fuliginea* (powdery mildew) on water melon (*Citrullus lanathus*. L). <https://doi.org/10.4314/bajopas.v9i1.13>.
- Thakur, M.P. and Agrawal, K.C. 1995. Epidemiological studies on powdery mildew of mungbean and urdbean. *Int. J Pest Manage.*, 41(3):146-153.
- Verma, A., Pandeya, S.N., Yadav, S.K., Singh, S. and Soni, P. 2011. A Review on *Coriandrum sativum* (Linn.) An Ayurvedic Medicinal Herb of Happiness. *J Adv. Pharm. Healthcare Res.*, 1(3): 28-48.