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Pappu Lal Dalal
Ph.D. Scholar, Department of
Entomology, SKN College of
Agriculture SKNAU, Jobner,
Rajasthan, India

Dr. Akhter Hussain
Professor & Head, Department
of Entomology, SKN College of
Agriculture SKNAU, Jobner,
Rajasthan, India

Meenu Choudhary
M.Sc., Department of
Agricultural Extension
Education, SKUAST, Jammu,
Jammu and Kashmir, India

Dr. Piyush Choudhary
Assistant Professor,
Department of Agronomy,
College of Agriculture,
Ummedganj, Kota, AU, Kota,
Rajasthan, India

Corresponding Author:
Pappu Lal Dalal
Ph.D. Scholar, Department of
Entomology, SKN College of
Agriculture SKNAU, Jobner,
Rajasthan, India

Screening of different coriander varieties against seed midge, *Systole albipennis*

Pappu Lal Dalal, Akhter Hussain, Meenu Choudhary and Piyush Choudhary

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Abstract

A field experiment was conducted to evaluate their relative susceptibility of ten coriander varieties against seed midge, *Systole albipennis*. at Agronomy Farm, Department of Entomology, S.K.N. College of Agriculture, Jobner during Rabi, 2021-22 and 2022-23 and the results of two years data indicated that the none of these was identified as completely free from the attack. The coriander varieties RCr-684, RCr-436 and ACr-1 were categorized as least susceptible to seed midge infestation; while the varieties ACr-2, RCr-475, RCr-480, RCr-435 and Pant Haritama were categorized as moderately susceptible, whereas, the varieties RCr-20 and Local were categorized as highly susceptible to seed midge infestation. The days to 50 per cent flowering and plant height had positive significant correlation with per cent seed damaged by seed midge. The umbels per plant and seeds per umbels had non- significant correlation with per cent seed damaged by seed midge. The biochemical parameters viz., total phenol and volatile oil indicated non- significant correlation with per cent seed damage.

Keywords: Coriander, susceptibility, screening and parameters

Introduction

Coriander (*Coriandrum sativum* L.) is one of the important winter seasons seed spice crop belongs to family Apiaceae, native of Mediterranean region. It is popularly known as “*Dhaniya*”. Coriander crop is extensively grown in the arid and semi-arid regions of India, covering an area of about 711.47 thousand hectares with the production of 947.76 thousand metric tonnes [Anonymous, 2021-22a] ^[1]. In the India, Rajasthan and Gujrat states have emerged as seed spice bowl and together contribute more than 80 per cent of the total coriander production. In Rajasthan, it is cultivated in 103.58 thousand hectare area with an annual production of 135.81 thousand metric tonnes and productivity being 1488 kg/ha [Anonymous, 2021-22b] ^[2]. Seed midge, *S. albipennis* has been reported as a regular and major pest of coriander in Rajasthan and other parts of the country. The use of insect resistant varieties offers the less use of chemicals and provides insect control at no additional cost and acts as preventive measure against buildup of insect population. Certain varieties are more preferred by the pest as compared to other or some may bear the losses caused by the pest, the study of the per cent seed damage on different varieties of coriander was done with a view to find out the least susceptible varieties against seed midge.

Materials and Methods

The experiment was laid out in a simple RBD with ten coriander varieties as treatments, each were replicated thrice. The crop was sown on 16th November, 2021 and 14th November, 2022 in the plot size of 3.0 x 2.0 m², keeping row to row and plant to plant spacing of 30 cm and 10 cm, respectively, was maintained by thinning of one month old plants.

Method of observations

The field surveys were carried out at seed formation stage of coriander from five randomly selected and tagged plants from each plot. From each plant three umbels each from upper, middle and lower parts of plant were selected. Total numbers of seeds/ umbel were counted and damaged seeds present on selected umbel were thoroughly checked with the help of magnifying glass (10x). The seed with appearance of black spot or insect exit hole was considered as damaged seed and per cent infestation were calculated.

Interpretation of data

The data obtained on seed midge damage from experiment field were transformed in to angular transformation values and subjected to analysis of variance. susceptibility of coriander varieties to seed midge at maturity stage were categorized on the basis of following formula:

$$\bar{X} \pm \sigma$$

Where,

$\bar{X}$ = Mean per cent seed damage

σ = Standard deviation of mean per cent seed damage

Mean per cent seed damage	Category
Below $\bar{X} - \sigma$	Least susceptible
$\bar{X} - \sigma$ to $\bar{X} + \sigma$	Moderately susceptible
Above $\bar{X} + \sigma$	Highly susceptible

Morphological and chemical parameters of different coriander varieties

Morphological characters

Morphological characters of plants viz., days to 50 per cent flowering, umbels per plant, seeds per umbels and plant height were be recorded during the crop growth and at harvest of the crop from five randomly selected and tagged plants.

Biochemical parameter

Estimation of total phenols and volatile oil

Total phenols in leaves were estimated by the method described by Bray and Thorpe (1954) [4]. Volatile oil in coriander seeds was estimated by essential oil distillation assembly i.e., Clevenger apparatus (A.O.A.C., 1970) [3].

The data obtained after recording morphological and biochemical parameters of varieties were subjected to analysis of variance and was correlated with per cent seed damage.

Results and Discussion

Seed midge, *Systole albipennis* (Walker)

Rabi, 2021-22

The data presented in table-1 and figure-1 revealed that the none of varieties of coriander was found immune from the attack of seed midge, *S. albipennis*. The per cent seed damage by seed midge ranged from 8.50 to 18.30 per cent. The minimum per cent seed damage of 8.50 per cent was recorded on variety RCr-684 followed by varieties RCr-436 (8.87%) and ACr-1 (9.07%), however, these were found at par with each other. The maximum per cent seed damage of 18.30 per cent was recorded on variety Local followed by varieties RCr-20 (18.17%) and RCr-475 (15.13), however, these were stood at par with each other. The varieties Pant haritama, ACr-2, RCr-435 and RCr-480 had seed damage of 12.37, 13.13, 14.20 and 14.83 per cent, respectively, and these were also found at par with variety RCr-475 and are ranked in the middle order of infestation.

Rabi, 2022-23

In the second-year observation (data presented in table-1 and figure-1), the per cent seed damage by seed midge ranged from 8.87 to 18.77 per cent. The minimum per cent seed damage was recorded on variety RCr-684 (8.87%) followed by varieties RCr-436 (9.20%) and ACr-1 (9.37%) however, these were found at par with each other. The

maximum per cent seed damage was recorded on variety Local (18.77%) followed by variety RCr-20 (18.47%) and had no significance difference with each other in their degree of seed damage. The variety Pant haritama had seed damage of 12.73 per cent followed by varieties ACr-2 (13.47%), RCr-435 (13.63%), RCr-480 (13.80%) and RCr-475 (14.23%), however, these were found at par with each other and are ranked in the middle order of seed midge caused by seed midge.

Pooled Rabi, 2021-22 and 2022-23

On the basis of overall pooled mean of the both the year, the per cent seed damage by seed midge ranged from 8.68 to 18.53 per cent on different varieties of coriander. The minimum per cent seed damage was recorded on variety RCr-684 (8.68%) followed by varieties RCr-436 (9.03%) and ACr-1 (9.22%), however, these were found at par with each other. The maximum per cent seed damage was recorded on variety Local (18.53%) followed by variety RCr-20 (18.32%), however, these were stood at par with each other in their degree of seed damage. The variety Pant haritama had seed damage of 12.55 per cent followed by varieties ACr-2 (13.28%), RCr-435 (13.92%), RCr-480 (14.32%) and RCr-475 (14.68%), however, these were found at par with each other and are ranked in the middle order of seed midge caused by seed midge.

Based on the statistical categorization ($\bar{X} \pm \sigma$), the seed midge damage was found to be below 9.72 per cent in varieties RCr-684, RCr-436, ACr-1 were categorized as least susceptible to seed midge infestation. The seed damage was in range of 9.72 to 16.79 per cent in varieties ACr-2, RCr-475, RCr-480, RCr-435, Pant Haritama were categorized as moderately susceptible and above 16.69 per cent in varieties RCr-20, Local were categorized as highly susceptible. The present finding is partially corroborated with Singh and Baswana (1984) [10] who screened 88 varieties/ cultivars of coriander against *S. albipennis* and found that none of varieties/ cultivar was immune, further they, also found that cultivars H-116, H-6, H-39, H-13, HE-29 and HC-143 suffered less than 5.0 per cent damage. Mamta (2020) [5] who screened different varieties for their resistant against seed midge and found that the Variety RCr-684 categorized as highly resistant and RCr-480, RCr-435 and RCr-475 as moderately resistant to seed midge damage which support the present investigations. The present finding is in agreement with Patil (2009) [6] who reported that none of the varieties/ cultivars of coriander found immune against *S. albipennis*, further, the variety RCr-436 found as less susceptible and varieties RCr-435 and RCr-480 were moderately susceptible against seed midge are also in conformity of the present findings. The present finding are partially corroborate with that of Singh *et al.* (2009) [11] and Purti *et al.* (2016) [7] who screened the different coriander varieties against seed midge and categorised as least, moderately and highly susceptible. Ram (2014) [8] screened fennel varieties against seed midge and none of the varieties was found immune against seed midge partially corroborates the present investigations.

Morphological and bio-chemical parameters of different coriander varieties

Morphological characters, Rabi, 2021-22

Days to 50 per cent flowering

The data presented in table-3 revealed that the Days to 50 per cent flowering of different coriander varieties ranged from 61.20 to 83.20 days. The Days to 50 per cent flowering was minimum in variety RCr-436 (61.20 days) followed by

variety RCr-684 (70.53 days). While, maximum Days to 50 per cent flowering was observed in variety Local variety (83.20 days) followed varieties RCr-20 (78.53 days) and ACr-2 (76.53 days). Days to 50 per cent flowering showed positively significant correlation of $r = 0.831$ with the per cent seed damage by seed midge.

Umbels per plant

The umbels per plant ranged from 26.95 to 33.05 in different varieties of coriander. The umbels per plant was maximum in variety RCr-436 (33.05 Umbels/ plant) followed by varieties RCr-475 (32.00 Umbels/ plant) and RCr-684 (31.90 Umbels/ plant). While, the minimum umbels per plant was observed in variety Pant Haritama (26.95 Umbels/ plant) followed by varieties RCr-435 (28.90 Umbels/ plant) and local (28.90 Umbels/ plant). Umbels per plant showed negative non- significant correlation of $r = -0.370$ with the per cent seed damage by seed midge.

Seeds per umbel

The seeds per umbel ranged from 27.45 to 42.95 in different varieties of coriander. The seeds per umbel was maximum in variety Local (42.95 seeds/ umbel) followed by variety RCr-20 (40.90 seeds/ umbel). While, the minimum seeds per umbel was observed in variety ACr-2 (27.45 seeds/ umbel) followed by varieties RCr-475 (28.55 seeds/ umbel) and RCr-480 (29.05 seeds/ umbel). Seeds per umbel showed positively non- significant correlation of $r = 0.565$ with the per cent seed damage by seed midge.

Plant height (cm)

The plant height ranged from 56.25 to 84.55 in different varieties of coriander. The plant height was maximum in variety Local (84.55 cm) followed by varieties RCr-20 (84.25 cm) and RCr-480 (83.25 cm). While, the minimum plant height was observed in variety RCr-436 (56.25 cm) followed by variety RCr-475 (69.45 cm). Plant height showed positively significant correlation of $r = 0.727$ with the per cent seed damage by seed midge.

Days of maturity

The days of maturity ranged from 155.00 to 169.87 in different varieties of coriander. The days of maturity was maximum in variety RCr-475 (169.87 days) followed by varieties local (168.47 days) and ACr-2 (167.00 days). While, the minimum days of maturity was observed in variety RCr-436 (155.00 days) followed by varieties RCr-684 (158.07 days) and RCr-435 (158.20 days). Days of maturity showed non- significant correlation of $r = 0.596$ with per cent seed damage by seed midge.

Biochemical parameters, Rabi, 2021-22

Total Phenol (%)

The total phenol ranged from 2.99 to 4.33 per cent in different varieties of coriander. The total phenol was maximum in variety RCr-684 (4.33%) followed by varieties ACr-2 (4.23%) and RCr-436 (3.83%). While, the minimum total phenol was observed in variety local (2.99%) followed by varieties ACr-1 (3.05%) and RCr-20 (3.05%). Total phenol showed negatively non- significant correlation of $r = -0.549$ with the per cent seed damage by seed midge.

Volatile oil (%)

The volatile oil ranged from 0.28 to 0.47 per cent in different varieties of coriander. The volatile oil was maximum in variety RCr-684 (0.47%) followed by varieties ACr-2 (0.44%) and RCr-435 (0.43%). While, the minimum volatile oil was observed in variety ACr-1 (0.28%) followed by varieties RCr-20 (0.29%) and local (0.30%). Volatile oil showed negatively non- significant correlation of $r = -0.164$ with the per cent seed damage by seed midge.

Morphological characters, Rabi, 2022-23

Days to 50 per cent flowering

The data presented in table-4 revealed that the Days to 50 per cent flowering of different varieties of coriander ranged from 62.20 to 84.73 days. The Days to 50 per cent flowering was minimum in variety RCr-436 (62.20 days) followed by varieties Pant Haritama (70.20 days) and RCr-684 (71.13 days). While, maximum Days to 50 per cent flowering was observed in variety Local variety (84.73 days) followed varieties RCr-20 (79.00 days) and RCr-475 (76.07 days). Days to 50 per cent flowering showed positively significant correlation of $r = 0.834$ with the per cent seed damage by seed midge.

Umbels per plant

The umbels per plant ranged from 25.95 to 32.95 in different varieties of coriander. The umbels per plant was maximum in variety RCr-436 (32.95 Umbels/ plant) followed by variety RCr-20 (30.95 Umbels/ plant). While, the minimum umbels per plant was observed in variety Pant Haritama (25.95 Umbels/ plant) followed by varieties RCr-435 (27.00 Umbels/ plant) and local (27.00 Umbels/ plant). Umbels per plant showed negative non- significant correlation of $r = -0.323$ with the per cent seed damage by seed midge.

Seeds per umbel

The seeds per umbel ranged from 23.55 to 41.95 in different varieties of coriander. The seeds per umbel was maximum in variety Local (41.95 seeds/ umbel) followed by variety RCr-20 (39.45 seeds/ umbel). While, the minimum seeds per umbel was observed in variety RCr-435 (23.55 seeds/ umbel) followed by ACr-2 (26.90 seeds/ umbel) and ACr-1 (28.45 seeds/ umbel). Seeds per umbel showed positively non- significant correlation of $r = 0.618$ with the per cent seed damage by seed midge.

Plant height (cm)

The plant height ranged from 59.45 to 83.45 in different varieties of coriander. The plant height was maximum in variety Local (83.45 cm) followed by varieties RCr-475 (83.25 cm) and RCr-20 (83.00 cm). While, the minimum plant height was observed in variety RCr-436 (59.45 cm) followed by ACr-1 (70.45 cm) and RCr-684 (71.15 cm). Plant height showed positively significant correlation of $r = 0.813$ with per cent seed damage by seed midge.

Days of maturity

The days of maturity ranged from 157.00 to 168.20 in different varieties of coriander. The days of maturity was maximum in variety RCr-475 (168.20 days) followed by varieties local (166.00 days) and ACr-2 (164.07 days). While, the minimum days of maturity was observed in variety RCr-436 (157.00 days) followed by varieties RCr-684 (159.53 days) and RCr-435 (161.87 days). Days of

maturity showed non- significant correlation of $r = 0.618$ with per cent seed damage by seed midge.

Biochemical parameters, Rabi, 2022-23

Total Phenol (%)

The total phenol ranged from 2.95 to 4.30 per cent in different varieties of coriander. The total phenol was maximum in variety RCr-684 (4.30%) followed by varieties ACr-2 (4.25%) and RCr-436 (3.83%). While, the minimum total phenol was observed in variety local (2.95%). Total phenol showed negatively non- significant correlation of $r = -0.514$ with the per cent seed damage by seed midge.

Volatile oil (%)

The volatile oil ranged from 0.26 to 0.45 per cent in different varieties of coriander. The volatile oil was maximum in varieties RCr-684 (0.45%) and ACr-2 (0.45%). While, the minimum volatile oil was observed in variety ACr-1 (0.26%) followed by varieties RCr-20 (0.27%) and Pant haritama (0.28%). Volatile oil showed negatively non- significant correlation of $r = -0.172$ with the per cent seed damage by seed midge.

Morphological characters (Pooled, Rabi, 2021-22 and 2022-23)

Days to 50 per cent flowering

The pooled data presented in table-5 revealed that the Days to 50 per cent flowering of different coriander varieties ranged from 61.70 to 83.97 days. The Days to 50 per cent flowering was minimum in variety RCr-436 (61.70 days) followed by varieties Pant haritama (70.70 days) and RCr-684 (70.83 days). While, maximum Days to 50 per cent flowering was observed in variety Local variety (83.97 days) followed by varieties RCr-20 (78.77 days) and ACr-2 (76.00 days). Days to 50 per cent flowering showed positively significant correlation of $r = 0.836$ with the per cent seed damage by seed midge.

Umbels per plant

The umbels per plant ranged from 26.45 to 33.00 in different varieties of coriander. The umbels per plant was maximum in variety RCr-436 (33.00 Umbels/ plant) followed by variety RCr-475 (31.45 Umbels/ plant). While, the minimum umbels per plant was observed in variety Pant Haritama (26.45 Umbels/ plant) followed by varieties Local (27.95 Umbels/ plant) and RCr-435 (27.95 Umbels/ plant). Umbels per plant showed negative non- significant correlation of $r = -0.356$ with the per cent seed damage by seed midge.

Seeds per umbel

The seeds per umbel ranged from 27.18 to 42.45 in different varieties of coriander. The seeds per umbel was maximum in variety Local (42.45 seeds/ umbel) followed by variety RCr-20 (40.18 seeds/ umbel). While, the minimum seeds per umbel was observed in variety ACr-2 (27.18 seeds/

umbel) followed by RCr-435 (27.25 seeds/ umbel) and RCr-475 (28.80 seeds/ umbel). Seeds per umbel showed positively non- significant correlation of $r = 0.605$ with the per cent seed damage by seed midge.

Plant height (cm)

The plant height ranged from 57.85 to 84.00 in different varieties of coriander. The plant height was maximum in variety Local (84.00 cm) followed by varieties RCr-20 (83.63 cm) and RCr-480 (82.25 cm). While, the minimum plant height was observed in variety RCr-436 (57.85 cm) followed by variety ACr-1 (70.75 cm). Plant height showed positively significant correlation of $r = 0.814$ with the per cent seed damage by seed midge.

Days of maturity

The days of maturity ranged from 156.00 to 169.04 in different varieties of coriander. The days of maturity was maximum in variety RCr-475 (169.04 days) followed by varieties local (167.24 days) and ACr-2 (165.54 days). While, the minimum days of maturity was observed in variety RCr-436 (156.00 Days) followed by varieties RCr-684 (158.80 days) and RCr-435 (160.04 days). Days of maturity showed non- significant correlation of $r = 0.623$ with per cent seed damage by seed midge.

Biochemical parameters, Rabi, 2022-23

Total Phenol (%)

The total phenol ranged from 2.97 to 4.32 per cent in different varieties of coriander. The total phenol was maximum in variety RCr-684 (4.32%) followed by varieties ACr-2 (4.24%) and RCr-436 (3.85%). While, the minimum total phenol was observed in variety local (2.97%) followed by varieties ACr-1(3.03%), RCr-20 (3.03%) and Pant haritama (3.03%). Total phenol showed negatively non- significant correlation of $r = -0.533$ with the per cent seed damage by seed midge.

Volatile oil (%)

The volatile oil ranged from 0.27 to 0.46 per cent in different varieties of coriander. The volatile oil was maximum in varieties RCr-684 (0.46%) and ACr-2 (0.45%). While, the minimum volatile oil was observed in variety ACr-1 (0.27%) followed by RCr-20 (0.28%) and Pant haritama (0.29%). Volatile oil showed negatively non- significant correlation of $r = -0.168$ with the per cent seed damage by seed midge.

The per cent seed damage by seed midge has significant positive correlation with days to 50 per cent flowering and plant height, whereas, non- significant correlation was observed with umbels per plant, seeds per umbel and days of maturity. The present finding are in agreement with that of Ram and Sharma (2019) reported that positive correlation between per cent seed damage by seed midge and time taken for 50 per cent flowering on fennel crops.

Table 1: Screening of different varieties against seed midge, *S. albipennis* during Rabi, 2021-22, 2022-23 and pooled

S. No.	Variety	Per cent seed damage*		
		2021-22	2022-23	Pooled
1	ACr-1	9.07 (17.52)	9.37 (17.82)	9.22 (17.67)
2	ACr-2	13.13 (21.25)	13.43 (21.50)	13.28 (21.37)
3	RCr-20	18.17 (25.23)	18.47 (25.45)	18.32 (25.34)
4	RCr-475	15.13 (22.89)	14.23 (22.16)	14.68 (22.53)

5	RCr-480	14.83 (22.65)	13.80 (21.81)	14.32 (22.23)
6	RCr-435	14.20 (22.14)	13.63 (21.67)	13.92 (21.90)
7	RCr-436	8.87 (17.32)	9.20 (17.66)	9.03 (17.49)
8	RCr-684	8.50 (16.95)	8.87 (17.32)	8.68 (17.14)
9	Pant Haritama	12.37 (20.59)	12.73 (20.91)	12.55 (20.75)
10	Local	18.30 (25.33)	18.77 (25.67)	18.53 (25.50)
SEm±		0.86	1.03	0.67
CD at 5%		2.57	3.05	1.92

* Mean of three replications, Figures in parentheses are angular transformed values

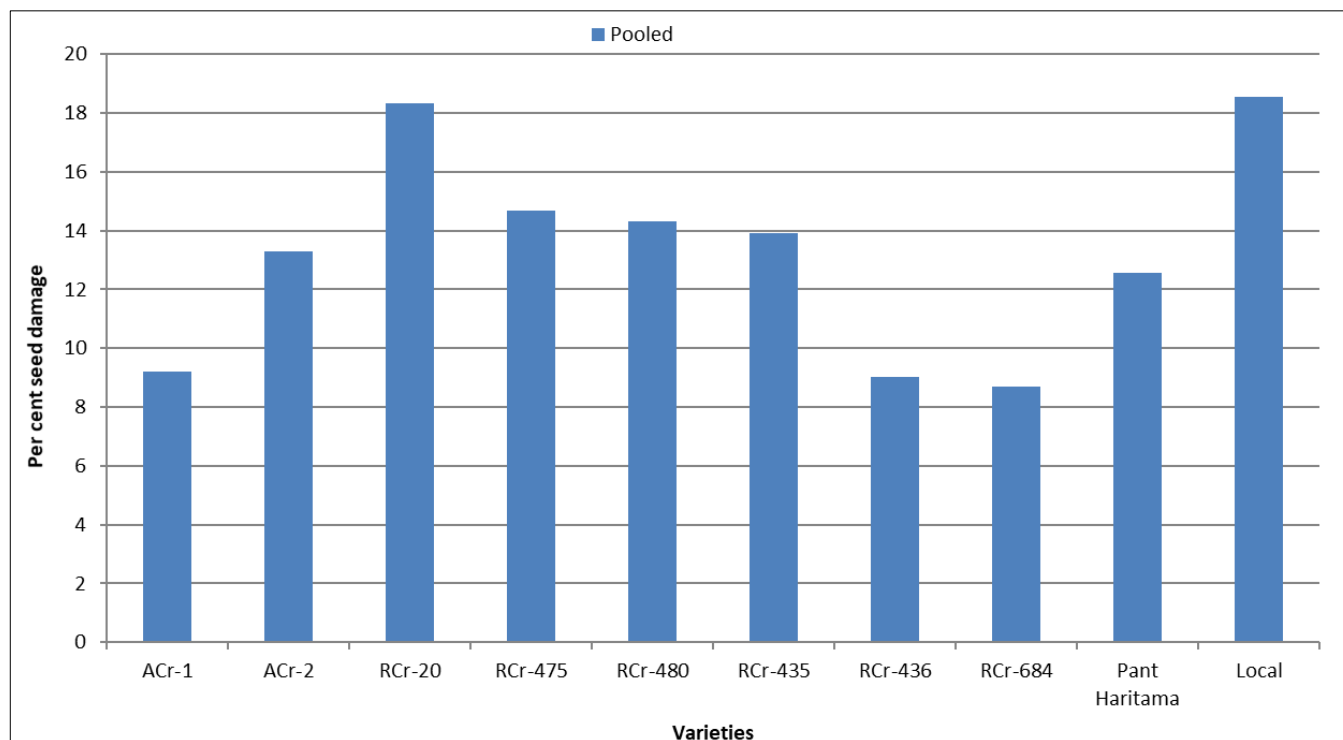


Fig 1: Screening of different varieties against seed midge *S. albipennis* (pooled Rabi, 2021-22 and 2022-23)

Table 2: Categorization of coriander varieties against seed midge, *Systole albipennis*

S. No.	Group	Seed damage (%)	Varieties
1	Least susceptible	Below 9.72	RCr-684, RCr-436, ACr-1
2	Moderately susceptible	9.72 to 16.79	ACr-2, RCr-475, RCr-480, RCr-435, Pant Haritama
3	Highly susceptible	Above 16.79	RCr-20, Local

Table 3: Morphological and biochemical parameters of different coriander varieties in relation to major insect pests of coriander during Rabi, 2021-22

S. No.	Variety	Per cent seed damage	Biophysical characters					Biochemical constituents	
			Days to 50% flowering	Umbels/plant	Seeds/umbel	Plant height (cm)	Days of maturity	Total phenol (%)	Volatile oil (%)
1	ACr-1	9.07	71.20	30.35	30.95	71.05	166.07	3.05	0.28
2	ACr-2	13.13	76.53	29.95	27.45	78.05	167.00	4.23	0.44
3	RCr-20	18.17	78.53	30.45	40.90	84.25	166.07	3.05	0.29
4	RCr-475	15.13	75.73	32.00	28.55	69.45	169.87	3.23	0.36
5	RCr-480	14.83	75.73	30.35	29.05	83.25	164.07	3.05	0.38
6	RCr-435	14.20	71.53	28.90	30.95	71.05	158.20	3.54	0.43
7	RCr-436	8.87	61.20	33.05	32.05	56.25	155.00	3.86	0.35
8	RCr-684	8.50	70.53	31.90	31.55	72.15	158.07	4.33	0.47
9	Pant Haritama	12.37	71.20	26.95	29.95	75.55	165.13	3.05	0.30
10	Local	18.30	83.20	28.90	42.95	84.55	168.47	2.99	0.36
Correlation coefficient (r) with Percent seed damage			0.831*	-0.370	0.565	0.727*	0.596	-0.549	-0.164

*Significant at 5 per cent level of significance.

Table 4: Morphological and biochemical parameters of different coriander varieties in relation to major insect pests of coriander during Rabi, 2022-23

S. No.	Variety	Per cent seed damage	Biophysical characters					Biochemical constituents	
			Days to 50% flowering	Umbels/plant	Seeds/umbel	Plant height (cm)	Days of maturity	Total phenol (%)	Volatile oil (%)
1	ACr-1	9.37	72.53	29.00	28.45	70.45	163.00	3.00	0.26
2	ACr-2	13.43	75.47	29.90	26.90	77.05	164.07	4.25	0.45
3	RCr-20	18.47	79.00	30.95	39.45	83.00	163.13	3.00	0.27
4	RCr-475	14.23	76.07	30.90	29.05	83.25	168.20	3.20	0.34
5	RCr-480	13.80	74.53	28.95	28.90	81.25	162.07	3.00	0.36
6	RCr-435	13.63	72.00	27.00	23.55	72.25	161.87	3.52	0.44
7	RCr-436	9.20	62.20	32.95	31.05	59.45	157.00	3.83	0.33
8	RCr-684	8.87	71.13	30.90	30.9	71.15	159.53	4.30	0.45
9	Pant Haritama	12.73	70.20	25.95	28.55	76.55	163.73	3.00	0.28
10	Local	18.77	84.73	27.00	41.95	83.45	166.00	2.95	0.34
Correlation coefficient (r) with Per cent seed damage			0.834*	-0.323	0.618	0.813*	0.618	-0.514	-0.172

*Significant at 5 per cent level of significance.

Table 5: Morphological and biochemical parameters of different coriander varieties in relation to major insect pests of coriander (pooled, Rabi, 2021-22 and 2022-23)

S. No.	Variety	Per cent seed damage	Biophysical characters					Biochemical constituents	
			Days to 50% flowering	Umbels/plant	Seeds/umbel	Plant height (cm)	Days of maturity	Total phenol (%)	Volatile oil (%)
1	ACr-1	9.22	71.87	29.68	29.70	70.75	164.54	3.03	0.27
2	ACr-2	13.28	76.00	29.93	27.18	77.55	165.54	4.24	0.45
3	RCr-20	18.32	78.77	30.70	40.18	83.63	164.60	3.03	0.28
4	RCr-475	14.68	75.90	31.45	28.80	76.35	169.04	3.22	0.35
5	RCr-480	14.32	75.13	29.65	28.98	82.25	163.07	3.03	0.37
6	RCr-435	13.92	71.77	27.95	27.25	71.65	160.04	3.53	0.44
7	RCr-436	9.03	61.70	33.00	31.55	57.85	156.00	3.85	0.34
8	RCr-684	8.68	70.83	31.40	31.23	71.65	158.80	4.32	0.46
9	Pant Haritama	12.55	70.70	26.45	29.25	76.05	164.43	3.03	0.29
10	Local	18.53	83.97	27.95	42.45	84.00	167.24	2.97	0.35
Correlation coefficient (r) with Percent seed damage			0.836*	-0.356	0.605	0.814*	0.623	-0.533	-0.168

*Significant at 5 per cent level of significance

Conclusion

On the basis of overall pooled mean of the both the year, the minimum per cent seed damage was recorded on variety RCr-684 (8.68%) whereas, maximum per cent seed damage was recorded on variety Local (18.53%). The ascending order of per cent seed damage caused by seed midge on different varieties of coriander was RCr-684 < RCr-436 < ACr-1 < Pant Haritama < ACr-2 < RCr-435 < RCr-480 < RCr-475 < RCr-20 and local. Based on the statistical categorization ($X \pm \sigma$), the coriander varieties RCr-684, RCr-436 and ACr-1 were categorized as least susceptible to seed midge infestation; while the varieties ACr-2, RCr-475, RCr-480, RCr-435 and Pant Haritama as categorized moderately susceptible and the varieties RCr-20 and Local categorized as highly susceptible to seed midge infestation. The days to 50 per cent flowering and plant height had positive significant correlation with per cent seed damage. Days of maturity had non-significant correlation with per cent seed damage. The umbels per plant and seeds per umbels had non-significant correlation with per cent seed damage. The biochemical parameters viz., total phenol and volatile oil indicated non-significant correlation with per cent seed damage.

Competing Interests

Authors have declared that no competing interests exist.

Author's Contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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