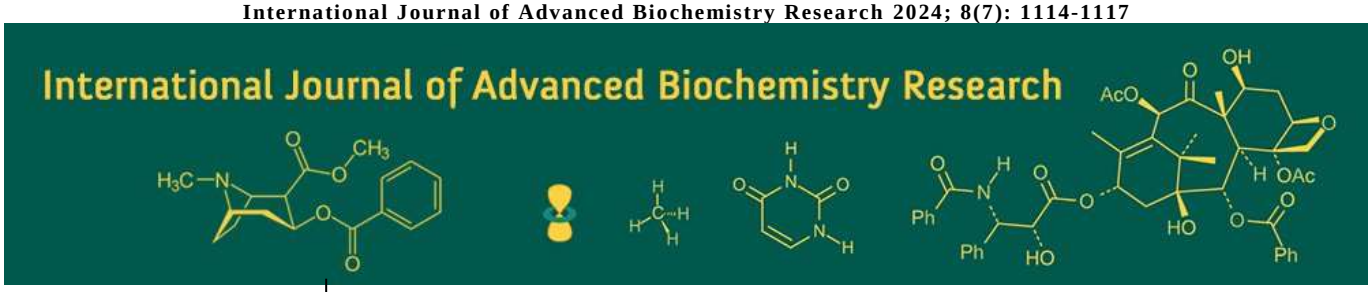

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Assessment of genetic variability in coriander (*Coriandrum sativum* L.) genotypes

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Abstract
The present investigation entitled as "Studies on genetic variability in Coriander (*Coriandrum sativum* L)" was executed at Main Experiment Station of the Department of Vegetable Science, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya (U.P.) during *Rabi* 2022-23. Plant material consisted of 42 genotypes of coriander including 2 checks namely Hisar Anand and NDCor2 laid out in Augmented Block Design. Among the entries, range of seed yield per plant varied from 5.54g to 10.29g and it was highest in NDCor-72 (10.29 g/plant) followed by NDCor-77 (10.10), NDCor-76 (9.74), NDCor-75 (9.72) and NDCor-83 (9.70) performed better over the check Hisar Anand (8.03) while its was lowest in NDCor-67 (5.54).

Keywords: Coriander, mean, heritability, variability, yield per plant

Introduction
Coriander (*Coriandrum sativum* L., 2n = 2x = 22) is a member of the Apiaceae family and is grown for its green leaves as well as its dried seeds. Most people refer to it as "Dhania". It is also known as coriandero (fruits), coentro (Portuguese), coriandolo (Italy), cilindro (leaves), and koriander in German and Dutch. Asia Minor and southern Europe are the native regions of coriander.

Fresh leaves cand be used for garnishing and are common ingredient in many foods like chutneys and salads. The green herb is also employed for the preparation of either steam-distilled essential oil or the solvent extracted oil or the solvent extracted oleoresin (Nadia and Kandi, 2012). Fresh juice of coriander is extremely advantageous is curing many deficiencies related to vitamins and iron. Coriander is used to cure diseases like digestive tract disorders, respiratory tract disorders, urinary tract infections. Coriander has been reported to possess many pharmacological activities like antioxidant (Darughe *et al*., 2012) [7], anti-diabetic (Eidi *et al.*, 2012) [8], anti-mutagenic (Cortes *et al*., 2004) [4], antilipidemic (Sunil *et al*., 2012) [15], anti-spasmodic (Alison *et al*., 1999) [1]. It is utilized as a natural preservative to lessen pain and inflammation, to cure certain disorders, and for its antifungal and anticancer qualities (De and De 2019) [5]. Coriander has also been found to improve blood glucose control, which suggests that it may have applications as an antihyperglycemic agent (Mandal *et al.* 2015) [10]. Although coriander may be grown year-round, its production is primarily for its leaves and a larger grain yield because the crop is extremely susceptible to dry, warm temperatures (Horn *et al.* 2023) [9]. Fatty acids, which are utilised in cosmetic products, make up 19% of the seeds. Coriander fruit (seed) and leaves (cilantro) are used in soups, bread, puddings, chicken and fish meals, curried meat dishes, and other ethnic foods (Sisein, 2014) [14]. During 2021-22, 7,35,280 MT of coriander was produced from 5,53,099-hectare area (Anonymous 2022-23) [2].

Materials and Methods
Experiment was conducted at Main Experiment Station, Department of Vegetable Science, Acharya Narendra Deva University of Agriculture and Technology, Narendra Nagar, Kumarganj, Ayodhya (U.P.). The experiment was conducted in Augmented Block Design in 2 blocks (20 genotypes + 2 checks in each block).

The experimental plant material comprised of 42 genotypes including 2 checks (Hisar Anand and NDCor-2) of coriander. Observation was taken on 12 quantitative characters *viz*. Days to 50% flowering, Number of nodes per plant, Internodal length (cm), Number of branches per plant, Plant height (cm), Number of umbels per plant, Number of umbellets per umbel, Number of schizocarps per umbel, Umbel diameter (cm), 1000 seed weight (g), Seed yield per plant (g), Seed yield per plot (g). Seed sowing is done on second last week of December, 2022 and harvesting is done in second week on April.

Results and Discussion

Days to 50% flowering with general mean of 63.87 days varied from 50.87 days (NDCort-94) to 74.04 days (NDCor-82). Out of 42 genotypes, top five genotypes NDCor-82 (74.04), NDCor-71 (73.34), NDCor-81 (70.82), NDCor-68 (70.18), NDCor-67 (69.86) are for this trait than best check Hisar Anand (65.96). Similar results were found by Choudhary *et al*. 2021 [3], ranges from 52.84 – 66.44 days.

Number of nodes per plant varied from 4.97 (NDCor-92) to 12.91 (NDCor-96) with general mean of 9.78 out of forty-two genotypes, top five genotypes were found significant viz NDCor-96 (12.91), NDCor-72 (12.44), NDCor-76 (12.36), NDCor-77 (12.33) and NDCor86(11.65) for this trait than best check NDCor-2 (10.65). Similar results were found by Saroj *et al.* 2022, ranges from 9.85 – 14.15.

Internodal length varied from 8.60 (NDCor-78) to 23.83 (NDCor-82) with general mean of 9.78. Out of forty-two genotypes, top five genotypes were found significant viz NDCor-72 (23.60), NDCor-63 (21.70), NDCor-100 (20.76), NDCor-87 (20.71) and NDCor-86 (19.83) were found significantly superior than best check Hisar Anand (17.00) for this trait. Similar results were found by Pandey *et al*. 2021 [11], in which parameter ranges from 8.32 – 14.23.

Number of branches per plant varied from 2.58 (NDCor-98) to 16.47 (NDCor-80) with general mean of 9.41. Out of forty-two genotypes, top five genotypes were found significant *viz* NDCor-80 (16.47), NDCor-67 (15.86), NDCor-77 (15.45), NDCor-72 (14.44), NDCor-63 (13.43) and NDCor-71 (13.43) for this trait than best check NDCor-2 (10.11). Similar findings were found by Verma *et al*. 2018 [16] in which the parameter ranges from 3.62 – 10.65.

Plant height (cm) varied from 118.33 cm (NDCor-79) to 140.47 cm (NDCor-81) with general mean of 129.92 cm. Out of forty-two genotypes, top five genotypes *viz* NDCor-81 (140.47), NDCor-92 (140.36), NDCor-91 (140.14), NDCor-82 (138.20), NDCor-77 (137.36) were found significantly superior than best check NDCor-2 (126.33) for this trait. Similar results were found by Singh *et al.* 2019 [13], in parameter ranges from 99.70 – 151.02.

Number of umbels per plant varied from 18.83 (NDCor-67) to 42.60 (NDCor-83) with general mean of 29.92. Out of forty-two genotypes, top five genotypes *viz* NDCor-83 (42.60), NDCor-99 (40.83), NDCor-100 (39.97), NDCor-90 (37.43) and NDCor-87 (36.82) were found significantly superior than best check Hisar Anand (31.75) for this trait. Similar results were found by Pandey *et al.* 2018 [11], in which parameter ranges from 23.47 – 34.03.

Number of umbellets per umbel varied from 4.96 (NDCor-91) to 9.21 (NDCor-85) with general mean of 29.92. Out of forty-two genotypes, top five genotypes *viz* NDCor-85 (9.21), NDCor-78 (9.20), NDCor-75 (8.33), NDCor-95 (7.79) and NDCor-69 (7.30) were found significantly superior than best check NDCor-2 (6.58) for this trait. Similar results were found by Verma *et al.* 2018 [16] in which parameter ranges from 5.11 – 7.87.

Number of schizocarps per umbel varied from 45.26 (NDCor-62) to 82.99 (NDCor-82) with general mean of 62.6. Out of forty-two genotypes, top five genotypes *viz* NDCor-82 (82.99), NDCor-83 (79.55), NDCor-66 (79.30), NDCor-68 (77.30) and NDCor-80 (76.82) were found significantly superior than best check Hisar Anand (68.19) for this trait. Similar results were found by Saroj *et al*. 2022 in which parameter ranges from 30.08 – 41.68.

Umbel diameter (cm) varied from 4.11 cm (NDCor-67) to 6.66 cm (NDCor-83) with general mean of 5.37. Out of forty-two genotypes, top five *viz* NDCor-83 (6.66), NDCor-77 (6.54), NDCor-88 (6.24), NDCor-93 (6.14) and NDCor-87 (5.99) were found significantly superior than best check Hisar Anand (5.61) for this trait. Similar results were found by Singh *et al.* 2019 [13], in which parameter ranges from 2.74 – 7.84 cm.

1000 seed weight (g) varied from 6.60 g (NDCor-82 & NDCor-88) to 14.44 g (NDCor-97) with general mean of 9.45g. Out of forty-two genotypes, top five genotypes *viz* NDCor-97 (14.44), NDCor-73 and NDCor-89 (14.22), NDCor-86 (14.05) and NDCor-81 (12.56) were found significantly superior than best check Hisar Anand (8.31) for this trait. Similar results were found by Saroj *et al*. 2022, in which parameter ranges from 6.92 – 14.09.

Seed yield per plant (g) varied from 5.54 g (NDCor-67) to 10.29 g (NDCor-72) with general mean of 7.87 g. Out of forty-two genotypes, top five genotypes *viz* NDCor-72 (10.29), NDCor-77 (10.10), NDCor-76 (9.74), NDCor-75 (9.72) and NDCor-83 (9.70) were found significantly superior than best check Hisar Anand (8.03) for this trait.

Seed yield per plot (g) varied from 166.20 g (NDCor-67) to 308.70 g (NDCor-72) with general mean of 236.41 g. Out of forty-two genotypes, top five genotypes *viz* NDCor-72 (308.70), NDCor-77 (303.0), NDCor-76 (292.20), NDCor-75 (291.60) and NDCor-83 (291.00) were found significantly superior than best check Hisar Anand (240.90) for this trait. Similar findings were found by Choudhary *et al*. 2021 [3], ranges from 146.39 – 363.84g.

Table 1: Mean performance of forty-two genotypes for twelve characters in coriander germplasm.

Characters / Germplasm	Days to 50%flowering	No. of nodes/plant	Internodal length	No. of branches/plant	Plant height	No. of umbels/plant	No. of umbellates/umbel	No. of schizocarps/umbel	Umbel diameter	1000 seed weight	Seed yield/plant	Seed yield/plot
ND Cor-61	65.20	10.10	15.60	12.08	126.32	26.63	5.68	60.25	5.56	8.30	8.64	259.20
ND Cor-62	63.24	9.01	16.15	9.99	126.52	22.64	6.64	45.26	5.42	8.22	6.66	199.80
NDCor-63	61.64	5.34	21.70	13.43	122.19	22.94	5.77	60.82	5.23	7.95	6.92	207.60
NDCor-64	66.18	8.65	14.69	12.62	129.11	26.85	5.30	60.46	5.26	8.77	7.72	237.60
ND Cor-65	63.18	5.32	19.94	8.51	131.11	23.83	5.58	76.02	5.43	9.96	8.96	268.80
NDCor-66	65.72	8.11	16.50	12.75	125.50	21.63	7.13	79.30	4.66	8.20	7.29	218.70
NDCor-67	69.86	8.34	13.35	15.86	120.65	18.83	6.62	49.70	4.11	7.39	5.54	166.20
NDCor-68	70.18	8.80	14.51	12.62	124.51	23.82	6.23	77.30	5.66	11.63	8.61	258.30
NDCor-69	69.52	8.09	16.49	12.67	125.67	28.70	7.30	66.79	4.61	9.35	9.29	278.70
NDCor-70	60.86	9.86	13.01	10.51	128.89	25.77	5.66	72.02	5.38	7.85	8.28	248.60
NDCor-71	73.34	8.65	15.56	13.43	127.43	24.62	6.12	56.34	5.10	8.53	6.86	205.80
NDCor-72	63.72	12.44	23.60	14.44	136.65	28.90	6.64	74.89	5.75	9.29	10.29	308.70
NDCor-73	66.01	9.56	14.40	10.19	131.21	26.63	5.93	66.92	5.56	14.22	7.49	224.70
NDCor-74	66.93	13.01	15.82	13.89	130.32	31.52	6.15	69.29	5.80	8.31	8.06	241.80
NDCor-75	54.61	10.65	19.49	13.43	134.87	32.25	8.33	69.57	5.66	8.41	9.72	291.60
NDCor-76	59.20	12.36	17.02	11.41	135.63	29.02	5.58	70.01	4.86	9.30	9.74	292.20
NDCor-77	59.81	12.33	16.49	15.45	137.36	32.73	6.20	73.01	6.54	12.43	10.10	303.00
NDCor-78	66.97	10.01	8.60	11.45	134.76	24.20	9.20	72.34	4.90	8.63	7.83	234.90
NDCor-79	65.89	11.58	16.90	12.53	118.33	21.62	5.68	50.27	4.42	8.91	6.32	189.60
NDCor-80	65.74	9.58	16.49	16.47	125.52	31.83	6.26	76.82	5.39	9.40	9.38	281.40
NDCor-81	70.82	5.79	18.74	7.03	140.47	31.17	5.40	58.13	5.30	12.56	6.38	191.40
NDCor-82	74.04	9.77	23.83	4.01	138.20	29.27	5.97	82.99	5.49	6.60	7.38	221.40
NDCor-83	61.25	9.79	19.05	4.13	132.25	42.60	6.31	79.55	6.66	11.03	9.70	291.00
NDCor-84	64.26	10.75	16.79	8.48	125.37	30.46	6.12	60.02	5.58	7.78	7.01	210.30
NDCor-85	61.84	8.43	19.12	7.92	135.69	30.17	9.21	52.99	5.62	7.67	8.10	243.00
NDCor-86	57.26	11.65	19.83	9.03	127.47	32.67	6.36	51.33	5.30	14.05	6.52	195.60
NDCor-87	59.44	7.63	20.71	12.25	128.00	36.22	6.27	66.18	5.99	8.12	6.49	194.70
NDCor-88	55.27	10.89	18.15	3.16	129.75	32.17	6.69	45.40	6.24	6.60	7.07	212.10
NDCor-89	63.37	12.22	18.96	3.38	123.34	33.68	5.88	63.17	5.14	14.22	8.52	255.60
NDCor-90	66.82	9.79	18.93	12.14	132.55	37.43	6.12	49.43	5.58	8.86	7.96	238.80
NDCor-91	67.03	10.99	14.31	3.23	140.14	33.37	4.96	68.98	4.87	11.02	6.61	198.30
NDCor-92	61.35	4.97	18.75	6.47	140.36	33.15	6.69	59.17	5.57	8.46	7.16	214.80
NDCor-93	58.17	8.31	17.41	4.14	131.67	36.71	6.27	62.51	6.14	9.24	9.47	284.10
NDCor-94	50.87	11.53	18.74	5.01	131.00	29.84	6.13	56.55	5.47	11.13	7.71	231.30
NDCor-95	62.27	11.66	11.94	3.81	135.16	30.45	7.79	68.99	4.68	8.88	7.62	231.90
NDCor-96	59.03	12.91	15.49	4.81	127.71	28.04	5.55	67.98	5.36	10.67	9.72	291.60
NDCor-97	67.45	7.27	15.78	6.90	130.57	30.42	6.69	61.93	5.14	14.44	7.28	218.40
NDCor-98	64.85	12.10	15.31	2.58	127.14	33.70	7.27	50.84	5.15	8.28	6.96	208.80
NDCor-99	60.07	11.10	18.12	6.56	122.82	40.83	5.55	53.18	4.80	8.03	6.42	192.60
NDCor-100	65.29	9.65	20.76	7.20	132.52	39.37	6.06	61.55	5.35	8.60	7.11	213.30
Hisar Anand	65.96	11.23	17.00	9.29	125.66	31.75	5.91	68.19	5.61	8.31	8.03	240.90
NDCor-2	68.28	10.65	20.61	10.11	126.33	28.62	6.58	55.91	5.23	7.56	7.74	232.20
Mean	63.87	9.78	17.25	9.41	129.92	29.92	6.37	63.62	5.37	9.45	7.87	236.41
S.E. D	0.51	0.01	0.23	0.19	0.04	0.75	0.01	0.73	0.05	0.04	0.04	1.20
C.D. at 5%	6.49	0.13	2.93	2.48	0.57	9.53	0.13	9.22	0.70	0.57	0.57	15.25
C.V.%	7.57	20.90	16.91	41.68	4.11	17.31	14.05	15.20	9.42	2.14	14.97	14.95
Lowest	50.87	4.97	8.60	2.58	118.33	18.83	4.96	45.26	4.11	6.60	5.54	166.20
Highest	74.04	12.91	23.83	16.47	140.47	42.60	9.21	82.99	6.66	14.44	10.29	308.70

Discussion

Coriander (*Coriandrum sativum* L.) is one of the major crops of spices. This study aimed to evaluate 42 genotypes of coriander for 12 quantitative traits. The genotypes NDCor72 followed by NDCor-77 and NDCor-76 performed better than the check variety i.e. Hisar Anand in terms of seed yield per plant.

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