

Performance of coriander (*Coriander sativum* L.) genotypes for growth, yield and quality under arid eastern plain of India

Yash Sharma¹., *S.N. Saxena² and Purnima Shrivatsava¹

¹Ph.D. Scholar, Bhagvanth University, Ajmer.

²ICAR-National Research Centre on Seed Spices, Tabiji, Ajmer

Abstract

An investigation was carried out in National Research Centre on seed Spices, Ajmer, Rajasthan, India during 2016 and 2017 rabi season for evaluation of Coriander (*Coriandrum sativum* L.) genotypes for growth, yield and quality. The experiment was laid out in the Randomized Complete Block Design with 36 genotypes and were replicated thrice. Significant differences were observed among genotypes for all the characters under study. The results revealed that, UD-715 recorded maximum plant height (117.66, 107.56 and 110.10cm) at harvest stage during first and second year, and in pooled analysis. The genotype JCR-975 has recorded less number of days flower initiation (13.23, 12.19 and 12.71 days) and days to 50% flowering (26.08, 23.98 and 25.03) in first year second year and in pooled analysis. The genotype VD-60 has recorded highest seed yield hectare⁻¹ (45.71, 41.19 and 43.45q) and minimum in genotype MKSM-1084 (11.02, 11.85 and 11.45q) both the year and in pooled analysis respectively. The genotypes ACr-78 and NDCOR-4 has reported highest essential oil percentage of 0.37% where as it was lowest in UD-629 and the genotype NDCOR-4 (24.97%) significantly out yielded compare to all the genotypes and lowest amount of total oil was reported in the genotype ACr-78 (3.40%). The genotypes VD-60, UD-715, ACr-121, ACr-25 and Acr-1 were identified as best performing genotypes and offer a good scope of selection for desired traits and can be used for parental material for breeding programme.

Introduction

The fascinating history of spices is a tale of adventure, congested seas, and ferocious naval rivalry. It was lure of these spices that brought many seafarers to the shore of India. It is the world's largest producer, consumer, and exporter of spices, with 63 different types of spices being grown. According to the Spices Board in Calicut, Kerala, India grows 52 different spices. Coriander (*Coriandrum sativum* L.) also called cilantro or dhania is an annual herb, belong to the family Apiaceae. There are two species in the genus *Coriandrum*. *C. sativum* is farmed among them. It comes from the Mediterranean region. It is grown for both green leaves and dried seeds. In India, it is cultivated in an area of 628.62 thousand hectare with the production of 822.20 tons (Anonymous, 2021). Rajasthan, Andhra Pradesh, Tamil Nadu, Karnataka, and Punjab are among the states where it is widely grown. Rajasthan is the major growing state and contributes about 40 per cent of coriander production in India. The plant is a smooth, erect annual herb that grows to a height of 60-100 cm, with prominently enlarged nodes and hollow internodes. The average seed yield of

coriander is low in India. Since the crop is grown mainly as sole crop in rabi season under rainfed or protective irrigation, moisture availability, short duration high yielding genotype for the particular zone/ region is boon to farmer to realize higher yield and returns. However India being a vast country with varied agro-climatic regions, different genotypes need to be evolved for specific regions. Hence, the present study was undertaken to evaluate different genotypes for growth, yield and quality.

Materials and Methods

The present investigation was carried out at Research Farm, NRC on Seed Spices, Ajmer, Rajasthan, India during Rabi of 2016 and 2017. 36 genotypes of coriander experimental material was evaluated in Randomized Block Design with 3 replications. The experiment was conducted on the same site during both years. The soil of the experimental site was sandy loam with a pH of 8.9 and having 0.23 percent organic carbon and 75.2, 32.8, and 233.5 kg ha⁻¹ available N, P₂O₅ and K₂O respectively. Seed were sown in last week of October, sowing was done at 2cm to 5cm depth with a

spacing of 30 x 22.5 cm between row to row and plant to plant spacing were maintained and crop was harvested in last week of March in both the year. Necessary cultural operations were taken up periodically for the experimental field. Observations were recorded for characters viz., plant height (cm), number of primary branches plant⁻¹, number of secondary branches plant⁻¹, plant spread (cm²), days to first flowering, days to 50 percent flowering, days to harvesting, number of umbels plant⁻¹, number of umbellets umbel⁻¹, number of seeds umbel⁻¹, days taken to maturity, dry matter production (g), seed yield plant⁻¹ (g), seed yield hectare⁻¹ (q), harvest index (%), test weight (g), essential oil and total oil content (%). Data on days to germination, number of leaves, yield was recorded during the crop growth period and essential oil content was estimated from the seeds. Pooled analysis of data was done as per the method suggested by Jawahar (2006).

Results and Discussion

The data pertaining to the growth parameter like Days to 50% germination, plant height, primary branches, secondary branches and plant spread of different genotypes differed significantly at various growth stages are presented in (Table 1). Number of days taken for 50% germination observed varied significantly. The genotype VDV/GL-2 took lesser number of days (11.67 days) during first year, whereas the genotypes VDV-GL-59, NDCOR-4 and LCC-210 recorded lesser duration 7.87 days and 10.27 days for 50% germination during second year and in pooled analysis respectively. The genotype Acr-121 recorded highest number of primary branches plant⁻¹ during first year (11.33) and in pooled analysis (10.42) whereas the genotype Acr-1 recorded highest number of primary branches in the second year (11.50). Minimum number of primary branches per plant was reported by the genotype VDV-GL-103 and MKSM-1084 (6.00) during first year and the 5-KCV-09-109 (6.50 and 6.75) during second year and pooled analysis. This might be due to the increased vegetative growth and crop duration. The results similar with the results of Malik and Tehlan (2013) and Phurailatpam *et al.* (2014). The maximum number of secondary branches plant⁻¹ was recorded in genotype VD-60 (45.71, 41.19 and

43.45 respectively) followed. The genotype MKSM-1084 recorded minimum number of secondary branches plant⁻¹ (11.02, 11.85 and 11.43, respectively). Such variations could be attributed to genetic constituents of the particular variety and its response to environmental conditions of particular region which favours good growth leading to production of more number of spreading branches.

The genotype UD-715 recorded highest plant height of (117.66, 107.56 and 110.10cm) at harvest stage during first and second year, and in pooled analysis. The minimum plant height of (67.40, 64.60 and 70.94 cm) was recorded by JCO-342. Variations in plant height were mainly due to genetic factors of the respective genotype as well as influence of the growing environmental conditions which in turn increases vegetative growth leading to synthesis of more carbohydrates and their utilization for food production and effective absorption of the nutrients resulting in increased yield.

The data pertaining to yield parameter of different genotypes differed significantly at various growth stages are presented in (Table 2). The genotype JCR-975 has recorded less number of days flower initiation (13.23, 12.19 and 12.71 days) and days to 50% flowering (26.08, 23.98 and 25.03) in first year second year and in pooled analysis whereas, genotype VDV-GL-103 (103.28, 55.48 and 79.38 days) and VDV/GL-43 (101.32, 87.54 and 94.43 days) was late flowering type in first year second year and in pooled analysis. Growth is also one of the important characters, which determines the earliness of the variety which is controlled by the genetic factors. Similar results were reported by Malik and Tehlan (2013). Highest number of umbels per plant was recorded in the genotype VD-60 (45.71, 41.19 and 43.45) and it was lowest in the genotypes MKSM-1084 (11.02, 11.85 and 11.43) during different periods of study. This variation in the yield could be attributed to genotypic character and response of the particular genotype to the specified environment conditions. These results more or less in consonance with the results of and Phurailatpam *et al.* (2014).

There was a highly significant variation has been observed with respect to maximum number of seeds

umbellet⁻¹ among the studies genotypes. During first year the genotypes UD-715 (117.66), JCO-339 (113.86) and JSS-R-59 (112.89) recorded highest number of seeds umbellet⁻¹ whereas it was lowest in UD-629 (71.04). During second year the genotypes ACr -5-02-83 (108.91), VDV-GL-80 (107.56), UD-715 (106.82), JCO-339 (106.35), NDCOR-20 (104.14) and MKSM-1084 (101.24). Further in the pooled analysis the genotypes JCO-339 (110.10), JSS-50 (107.98) and VDV/GL-43 (103.35) out yielded the others. Minimum seeds umbellet⁻¹ was recorded in UD-629 (71.04), VDV-GL-103 (67.78) and JCO-302 (70.94) during first year, second year and in pooled analysis respectively. The results are in comparison with the output obtained by Nandakumar *et al.* (2018).

The genotype VD-60 has recorded highest seed yield hectare⁻¹ (45.71, 41.19 and 43.45q) and minimum in genotype MKSM-1084 (11.02, 11.85 and 11.45q) during first year, second year and in pooled analysis respectively. The difference in seed yield plant⁻¹ might be due to the genotypic difference and ecological variation. The results are more or less in consonance with the results of Akshata *et al.* (2018). Test weight was also found to be one of the important yield components in deciding the seed yield hectare⁻¹. The genotype Acr-121 (11.33 and 10.42 g) during first year and in pooled analysis whereas the genotype ACr-1 (11.50g) in second year has recorded the highest test weight. While, it was lowest in the genotype VDV-GL-103 (6.00 g) and MKSM-1084 (6.00g) during first year and the genotype 5-KCV-09-109 (6.50g and 6.75g) during second year and in pooled analysis respectively. This may be mainly due to genetic factor of the respective genotype as well as influence of the growing environmental conditions. The present findings are in consonance with the findings of Velayudham *et al.* (2004) and Akshata *et al.* (2018)

Essential oil and total oil content

Essential oil and total oil content varied significantly with respect genotypes and in both the year of the study, in pooled analysis. The data pertaining to essential oil percentage revealed that there was significant difference with respect to genotypes and shade intensities (Table 3). Essential oil % had shown a range of 0.14 to 0.37 % with a CV of 9.59 whereas Total oil % had shown a range of 3.40 to 24.97 % with a CV of 13.38 in pooled analysis of the two years study. During first year the genotypes ACr-78, LCC-210, ACr-100 and 5-KCV-09-109 has recorded higher essential oil content (0.37%) and lowest (0.15 %) was recorded in the genotypes UD-629 and JSS-R-50. During second year genotype ACr-78 (0.37%) and VDV-GL-34 (0.36%) has highest essential oil content. In pooled analysis the genotypes ACr-78 and NDCOR-4 has reported highest essential oil percentage of 0.37% where as it was lowest in UD-629. Total oil content varied significantly among all the studied genotypes, the genotype NDCOR-4 (24.97%) significantly out yielded compare to all the genotypes and lowest amount of total oil was reported in the genotype ACr-78(3.40%). This could be attributed to the lower starch content. Starch being a primary metabolite, may affect the accumulation of secondary metabolites like oil. These results are in conformity results of the (Palanikumar and Rajamani, 2012) and Nandakumar *et al.* (2018).

Conclusion

Based on growth and yield it can be concluded that the genotypes VD-60, UD-715, ACr-121, ACr-25 and Acr-78 were found superior among the studied genotypes with respect to growth yield and quality parameter. These genotypes can be used in further population improvement in for crop improvement programmes.

Table 1. Growth parameters observed in coriander genotypes.

Genotypes	Days to 50% germination			No. of primary branches			No. of secondary branches			Height at harvest		
	(days)			(No.)			(No.)			(cm)		
	I	II	Pooled	I	I	I	I	II	Pooled	I	II	Pooled
MKSM-1084	12.33	9.12	10.73	6.00	7.50	6.75	11.02	11.85	11.43	96.21	101.24	98.73
LOCAL-144	12.33	9.83	11.08	7.67	8.50	8.08	19.19	18.58	18.88	79.17	75.47	77.32
UD-629	12.67	9.03	10.85	7.33	7.00	7.17	17.69	18.26	17.97	71.04	93.14	82.09
ACr-5-02-83	12.67	9.30	10.98	7.67	10.50	9.08	27.99	27.70	27.84	79.75	108.91	94.33
UD-348	13.67	9.83	11.75	8.67	10.00	9.33	34.12	35.15	34.63	78.36	69.21	73.78
JCR-975	13.33	9.93	11.63	8.33	9.50	8.92	35.17	32.07	33.62	96.99	89.21	93.10
VDV/GL-43	14.67	10.03	12.35	6.33	10.00	8.17	32.93	32.05	32.49	111.08	95.63	103.35
VD-60	14.67	9.03	11.85	8.67	10.00	9.33	45.71	41.19	43.45	76.01	74.49	71.81
ACr-256	14.67	9.03	11.85	7.33	8.50	7.92	24.76	23.50	24.13	77.77	81.78	79.78
ACr-78	14.33	8.85	11.59	7.00	8.50	7.75	27.29	28.67	27.98	85.25	89.23	87.24
VDV-GL-59	12.67	7.87	10.27	7.00	9.50	8.25	26.08	23.04	24.56	89.89	81.83	85.86
JSS-R-50	12.67	8.85	10.76	9.67	8.00	8.83	25.06	25.82	25.44	112.89	103.08	107.98
VDV-GL-103	12.67	9.03	10.85	6.00	11.00	8.50	25.83	26.30	26.06	98.70	67.78	83.24
VDV-GL-40	12.33	8.85	10.59	9.00	9.00	9.00	23.83	24.74	24.28	81.50	94.97	88.23
NDCOR-4	12.67	7.87	10.27	7.67	10.00	8.83	31.17	28.06	29.61	77.14	97.99	87.56
UD-715	13.67	9.83	11.75	8.67	9.00	8.58	22.58	23.07	20.58	117.66	107.56	110.10
LCC-210	12.67	7.87	10.27	7.33	8.50	7.92	23.52	26.82	25.17	84.78	73.33	79.06
ACr-100	13.67	8.85	11.26	8.67	9.50	9.08	32.94	34.06	33.50	100.49	94.24	97.36
ACr-1	14.67	9.83	12.25	6.67	11.50	9.08	31.02	30.48	30.75	92.83	88.51	90.67
UD-95	14.33	8.85	11.59	8.00	9.50	8.75	30.31	31.26	30.78	76.32	80.94	78.63
ACr-53	14.33	9.83	12.08	7.67	10.00	8.83	29.76	33.37	31.57	90.88	72.18	81.53
JCr-928	12.67	10.13	11.40	9.33	8.00	8.67	18.34	20.22	19.28	78.91	93.27	86.09
VDV-GL-34	13.33	8.85	11.09	9.33	10.00	9.67	34.06	32.10	33.08	94.86	77.99	86.42
5-KCV-09-109	12.33	9.03	10.68	7.00	6.50	6.75	20.68	18.00	19.34	99.70	89.48	94.59
VDV-GL-80	12.33	10.33	11.33	6.33	9.50	7.92	28.17	29.48	28.82	91.54	106.82	99.55
VDV/GL-2	11.67	9.83	10.75	9.00	10.50	9.75	32.74	30.35	31.55	73.30	85.15	79.23
ACr-160	12.67	9.93	11.30	7.67	11.00	9.33	41.71	40.32	41.01	93.03	85.35	89.19
ACr-25	14.67	11.04	12.85	9.33	8.50	8.92	27.75	24.58	26.17	85.51	78.20	81.85
JCO-342	14.67	10.03	12.35	9.33	9.00	9.17	42.88	37.91	40.40	67.40	64.60	70.94
ACr-121	14.33	10.03	12.18	11.33	9.50	10.42	35.96	31.45	33.71	81.32	85.98	83.65
NDCOR-20	13.33	8.85	11.09	9.00	7.50	8.25	19.85	21.55	20.70	91.29	104.14	97.72
ACr-35	13.33	8.85	11.09	10.00	10.00	8.25	28.11	30.39	20.70	76.27	71.22	97.72
UD-742	12.67	8.85	10.76	8.67	9.00	8.83	23.37	26.30	24.84	72.87	88.19	80.53
ACr-181	12.67	9.03	10.85	8.33	8.50	8.42	26.04	26.16	26.10	78.19	77.46	77.82
JCO-339	12.15	9.03	10.59	8.65	9.50	9.07	24.42	22.05	23.23	113.86	104.35	108.10
MKSM-1065	12.15	9.03	10.59	7.28	8.00	7.64	20.02	22.91	21.46	99.00	80.23	89.62
S Em±	0.19	0.13	0.11	0.12	0.14	0.20	0.47	0.41	0.87	4.90	2.89	5.37
CD(0.05)	0.52	0.37	0.32	0.34	0.39	0.56	1.32	1.16	2.44	13.82	8.15	15.01
CV %	2.43	2.42	2.48	2.61	2.64	5.66	2.91	2.60	7.74	9.64	5.74	15.01

References

- Akshata, H., Basavaraja, N., Hongal, S., Hegde, N.K. and Kulkarni, S. 2018. Evaluation of coriander (*Coriandrum sativum* L.) genotypes for yield and quality under hill zone (zone-9) of Karnataka, India. *Int. J. Curr. Microbiol. App. Sci.*, 7(5): 2494-2502.
- Anonymous. <http://indianspices.com/sites/default/files/majorspicesstatewise2021.pdf>.
- Jawahar, Sharma, R. 2006. Experimental field design for plant breeding. Statistical and Biometrical techniques in Plant Breeding. NewAge International (P) Limited Publishers, New Delhi. pp.11-16.
- Malik, T.P., Tehlan, S.K. 2013. Performance of coriander (*Coriandrum sativum* L.) varieties for growth and seed yield. *Int. J Seed Spices*, 3:89-90.
- Nandakumar, K., Chandrappa, H., Raviraja, Shetty G., Hemanth, Kumar P. and Harish, Babu B.N. 2018. Evaluation of coriander (*Coriandrum Sativum* L.) genotypes for growth, yield and quality under central dry zone of Karnataka. *J. Pharmacognosy and Phytochemistry*. 114-11.
- Palanikumar, M., Rajamani, K. 2012. Evaluation of coriander (*Coriandrum sativum* L.) genotypes for fresh, dry biomass yield and oil content under different seasons. *J Crop Res.* 44(1&2):194-202.
- Phurailatpam, A.K., Geetha, K.A., Meena, R.S., Maiti, S. 2016. Evaluation of coriander (*Coriandrum sativum* L.) cultivars for yield and yield contributing character in Gujarat. *J Spices and Aromatic crops*, 25(1):7-12.
- Velayudham, A. 2004. Evaluation and effects of organics with bio-inoculants in coriander var. Co 3. M.Sc (Hort.) Thesis, Univ. Agric. Sci., Dharwad, 2004.

Received : October 2020; Revised : November 2020;

Accepted : December 2020.

Table 2. Reproductive and yield attributes observed in different coriander genotypes.

Genotypes	Days to Flower initiation				Days to 50% flowering				Seeds per umbellet				Test weight				Yield	
	Days		Pooled		Days		Pooled		No.		Pooled		gm		q/h			
	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II		
MKSM-1084	14.58	15.34	14.96	14.96	60.98	62.62	11.02	11.85	11.43	96.21	101.24	98.72	6.00	7.50	6.75	11.02	11.85	
LOCAL-144	57.93	55.11	56.52	56.52	75.47	72.13	73.80	19.19	18.58	18.88	75.47	77.32	7.67	8.50	8.08	19.19	18.58	
UD-629	25.53	33.48	29.51	29.51	38.08	49.96	44.02	17.69	18.26	17.97	71.04	82.09	7.33	7.00	7.17	17.69	18.26	
ACr-5-02-83	21.92	29.87	25.89	25.89	53.43	72.92	63.17	27.99	27.70	27.84	79.75	94.33	7.67	10.50	9.08	27.99	27.70	
UD-348	40.70	35.50	38.10	38.10	59.32	51.99	55.66	34.12	35.15	34.63	78.36	69.21	8.67	10.00	9.33	34.12	35.15	
JCR-975	13.23	12.19	12.71	12.71	26.08	23.98	25.03	35.17	32.07	33.62	96.99	89.21	8.33	9.50	8.92	35.17	32.07	
VDV/GL-43	69.81	37.55	53.68	53.68	101.32	87.54	94.43	32.93	32.05	32.49	111.08	95.63	6.33	10.00	8.17	32.93	32.05	
VD-60	52.54	46.61	49.57	49.57	56.09	49.65	52.87	45.71	41.19	43.45	76.01	67.60	8.67	10.00	9.33	45.71	41.19	
ACr-256	36.21	38.02	37.12	37.12	54.97	57.79	56.38	24.76	24.13	24.13	77.77	81.78	7.33	8.50	7.92	24.76	23.50	
ACr-78	35.20	35.90	35.55	35.55	59.45	62.29	60.87	27.29	28.67	27.98	85.25	89.23	7.00	8.50	7.75	27.29	28.67	
VDV-GL-59	18.93	17.09	18.01	18.01	64.75	58.80	61.77	26.08	23.04	24.56	89.89	81.83	7.00	9.50	8.25	26.08	23.04	
JSS-R-50	16.02	14.65	15.34	15.34	81.70	78.20	78.20	25.06	25.82	25.44	112.89	103.08	9.67	8.00	8.83	25.06	25.82	
VDV-GL-103	103.28	55.48	79.38	79.38	65.50	45.06	55.28	25.83	26.30	26.06	98.70	67.78	6.00	11.00	8.50	25.83	26.30	
VDV-GL-40	27.88	32.48	30.18	30.18	69.57	81.06	75.32	23.83	24.74	24.28	81.50	94.97	9.00	9.00	9.00	23.83	24.74	
NDCOR-4	25.34	32.43	28.80	28.80	62.61	79.66	71.14	31.17	28.06	29.61	77.14	97.99	7.67	10.00	8.83	31.17	28.06	
UD-715	74.03	32.43	64.57	64.57	103.42	93.92	87.78	22.58	23.07	20.58	117.66	106.82	8.67	9.00	8.58	22.58	23.07	
LCC-210	45.27	38.99	42.13	42.13	61.77	53.33	57.55	23.52	26.82	25.17	84.78	73.33	7.33	8.50	7.92	23.52	26.82	
ACr-100	50.24	35.66	42.95	42.95	83.70	78.71	81.21	32.94	34.06	33.50	100.49	94.24	8.67	9.50	9.08	32.94	34.06	
ACr-1	20.19	18.89	19.54	19.54	63.58	60.21	61.90	31.02	30.48	30.75	92.83	88.51	6.67	11.50	9.08	31.02	30.48	
UD-95	31.00	32.82	31.91	31.91	47.14	50.02	48.58	30.31	31.26	30.78	76.32	80.94	8.00	9.50	8.75	30.31	31.26	
ACr-53	50.84	40.29	45.56	45.56	80.58	64.25	72.41	29.76	33.37	31.57	90.88	72.18	7.67	10.00	8.83	29.76	33.37	
JCr-928	21.38	26.29	23.84	23.84	58.82	69.41	64.12	18.34	20.22	19.28	78.91	93.27	86.09	9.33	8.00	18.34	20.22	
VDV-GL-34	43.92	35.98	39.95	39.95	70.70	58.27	64.48	34.06	32.10	33.08	94.86	77.99	86.42	9.33	10.00	34.06	32.10	
5-KCV-09-109	23.03	18.62	20.82	20.82	70.59	63.01	66.80	20.68	18.00	19.34	99.70	89.48	7.00	6.50	6.75	20.68	18.00	
VDV-GL-80	15.66	18.39	17.03	17.03	59.67	70.13	64.90	28.17	29.48	28.82	91.54	107.56	6.33	9.50	7.92	28.17	29.48	
VDV/GL-2	26.23	30.28	28.25	28.25	68.30	79.37	73.83	32.74	30.35	31.55	73.30	85.15	9.00	10.50	9.75	32.74	30.35	
ACr-160	39.62	36.51	38.06	38.06	78.54	72.04	75.29	41.71	40.32	41.01	93.03	85.35	7.67	11.00	9.33	41.71	40.32	
ACr-25	34.75	31.79	33.27	33.27	64.40	58.89	61.64	27.75	24.58	26.17	85.51	78.20	8.15	8.50	8.92	27.75	24.58	
JCO-342	33.72	37.06	35.39	35.39	56.90	62.87	59.89	42.88	37.91	40.40	67.40	74.49	9.33	9.00	9.17	42.88	37.91	
ACr-121	20.18	21.06	20.62	20.62	63.43	66.53	64.98	35.96	31.45	33.71	81.32	85.98	11.33	9.50	10.42	35.96	31.45	
NDCOR-20	26.52	30.24	28.38	28.38	71.98	81.99	76.99	19.85	21.55	20.70	91.29	104.14	9.00	7.50	8.25	19.85	21.55	
ACr-35	41.52	38.88	38.38	38.38	70.23	65.60	76.99	28.11	30.39	20.70	76.27	71.22	10.00	10.00	8.25	28.11	30.39	
UD-742	18.77	22.71	20.74	20.74	67.33	81.50	74.41	23.37	26.30	24.84	72.87	88.19	8.67	9.00	8.83	23.37	26.30	
ACr-181	37.02	36.71	36.87	36.87	69.02	68.26	68.64	26.04	26.16	26.10	78.19	77.46	8.33	8.50	8.42	26.04	26.16	
JCO-339	27.32	22.40	24.86	24.86	64.84	60.82	62.83	24.42	22.05	23.23	113.86	106.35	8.65	9.50	9.07	24.42	22.05	
MKSM-1065	37.47	30.20	33.84	33.84	86.06	69.47	77.76	20.02	22.91	21.46	99.00	80.23	7.28	8.00	7.64	20.02	22.91	
S Em±	4.88	2.82	0.96	0.96	5.04	3.32	4.72	0.47	0.41	0.87	4.90	2.89	0.12	0.14	0.20	0.47	0.41	
CDI(0.05)	13.76	7.95	2.67	2.67	14.20	9.36	13.19	1.32	1.16	2.44	13.82	8.15	0.34	0.39	0.56	1.32	1.16	
CV %	23.82	15.58	7.01	7.01	13.14	8.77	17.51	2.91	2.60	7.74	9.64	5.74	2.61	2.64	5.66	2.91	2.60	

Table 3. Essential oil and total oil recovery among studied genotypes.

Genotypes	Essential oil (%)			Total oil (%)		
	I	II	Pooled	I	II	Pooled
MKSM-1084	0.17	0.26	0.22	8.69	8.86	8.78
LOCAL-144	0.25	0.10	0.17	6.62	6.60	6.61
UD-629	0.15	0.13	0.14	6.73	6.78	6.75
ACr-5-02-83	0.25	0.36	0.30	10.81	10.50	10.66
UD-348	0.25	0.33	0.29	11.70	12.01	11.86
JCR-975	0.27	0.36	0.32	12.54	12.45	12.50
VDV/GL-43	0.34	0.33	0.33	5.01	4.92	4.96
VD-60	0.20	0.16	0.18	5.78	5.73	5.75
ACr-256	0.20	0.30	0.25	6.65	6.54	6.60
ACr-78	0.37	0.37	0.37	3.41	3.39	3.40
VDV-GL-59	0.22	0.33	0.28	18.74	17.90	18.32
JSS-R-50	0.15	0.33	0.24	9.24	9.59	9.41
VDV-GL-103	0.30	0.33	0.32	12.58	12.84	12.71
VDV-GL-40	0.27	0.40	0.34	5.43	5.41	5.42
NDCOR-4	0.35	0.40	0.37	24.89	25.04	24.97
UD-715	0.25	0.20	0.17	10.69	10.80	8.65
LCC-210	0.37	0.33	0.35	4.51	4.37	4.44
ACr-100	0.37	0.33	0.35	19.09	19.22	19.15
ACr-1	0.32	0.33	0.32	6.78	6.94	6.86
UD-95	0.25	0.17	0.21	7.95	7.96	7.96
ACr-53	0.27	0.23	0.25	7.34	7.51	7.43
JCr-928	0.32	0.33	0.33	9.52	9.83	9.68
VDV-GL-34	0.35	0.27	0.31	7.99	7.73	7.86
5-KCV-09-109	0.37	0.33	0.35	10.82	10.86	10.84
VDV-GL-80	0.22	0.33	0.28	11.75	11.81	11.78
VDV/GL-2	0.22	0.36	0.29	18.58	18.21	18.39
ACr-160	0.25	0.20	0.22	9.66	9.64	9.65
ACr-25	0.27	0.30	0.29	11.97	12.08	12.03
JCO-342	0.30	0.27	0.28	6.35	6.45	6.40
ACr-121	0.30	0.30	0.30	4.88	4.89	4.89
NDCOR-20	0.20	0.20	0.20	11.15	10.77	10.96
ACr-35	0.22	0.17	0.20	8.98	8.98	10.96
UD-742	0.25	0.23	0.24	5.37	5.33	5.35
ACr-181	0.17	0.27	0.22	8.60	8.90	8.75
JCO-339	0.30	0.26	0.28	5.51	5.40	5.45
MKSM-1065	0.30	0.30	0.30	9.14	9.17	9.16
S Em±	0.00	0.00	0.01	0.18	0.15	0.52
CD(0.05)	0.01	0.01	0.03	0.52	0.42	1.47
CV %	3.13	2.45	9.59	3.33	2.67	13.38