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Mean performance of pea (*Pisum sativum* L.) germplasm under mid hill conditions of Western Himalayan region

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Abstract

The experimental evaluation was done in mid hill conditions of western Himalayan range during Rabi season of 2014-15. Forty three genotypes including two check cultivars were evaluated for different horticultural traits. Among studied genotypes 14/PMVAR-3, 14/PEVAR-6, 14/PEVAR-2, 14/PMVAR-1 and EC-598628 were reported superior over other entries and standard checks for yield, quality and other important horticultural traits. 14/PMVAR-3 was found superior to checks for most of studied traits viz. number of pods per plant(12.43), pod length (9.23cm), pod width (1.62cm), number of seeds per pod (8.93), shelling percentage (66.18per cent), weight of 100 pods (480g), pod yield (5.77kg/plot), pod yield (128.22q/ha) and total soluble solids (18.50per cent). Genotype 14/PMVAR-1 (3.18) had recorded yield comparable to check cultivar and also showed moderately resistant reaction to powdery mildew disease. In the present study 3 genotypes were found earliest among all genotypes and can be involved in breeding programmes to develop early cultivars in pea. Two genotypes were found superior to yield and yield contributing traits when compared with the performance of the check cultivars in the present study.

Keywords: evaluation, genotype, superior, quality, yield

Introduction

Pea a very important member of Fabaceae family placed under genus *Pisum* ($2n=2x=14$) and it comprise both the wild (*P. fulvum* and *P. elatius*) and cultivated species (*P. abyssinicum*) (Ellis *et al.*, 2011) [2]. Mediterranean region is primary centre of its origin with Ethiopia and Near East as secondary centres (Blixt, 1970) [1]. Pea is one among the earliest food crops and is second most vital food legume next to common bean. It's predominantly a self-pollinated, annual herb having climbing or bush type growth habit. Pea holds a prominent place among vegetables due to its high nutritive value, notably proteins and various other health building substances like carbohydrates, vitamin A, vitamin C, calcium and phosphorus (Sharma, 2010)[5]. It contains an honest proportion of essential amino acids particularly lysine (Ghobary, 2010) [3] and is a cheapest source of protein in diet. Productivity per unit area of peas remains low regardless of its high economic importance; which is more prominent among offseason varieties. Pea fits well under intensive agriculture, and for it short duration cultivars are desirable. In this research pea cultivars were evaluated phenotypically for their behaviour w.r.t. early maturity so that these can be further used to develop short duration varieties. Yield is quite complicated trait which is highly influenced by environmental conditions and the selection on the basis of observed phenotypic variability is not effective as it depends a lot more on the nature and magnitude of heritable variations. Hence new trends of breeding need to be developed using only a couple of commercial varieties as parents within the breeding programmes again and again has also led to low genetic diversity among pea cultivars (Simioniuc *et al.*, 2002) [6].

Materials and Methods

The experiment was conducted at Research Farm of the Department of Vegetable Science, Dr YS Parmar University of Horticulture and Forestry, Nauni, Solan (HP) in Rabi 2014-2015. This location lies at 30°50' N latitude, 77°11'30" E line of longitude and is 1260 m above mean sea level and represents the mid-hill zone of Himachal Pradesh. The climate of the Experimental Farm is usually characterised as sub-humid, sub-temperate with cool winters.

For present investigation, 43 pea genotypes including 2 check varieties VRP-6 and Pb.89 were used. The genotypes along with their source of availability have been presented in Table 1. Observations were recorded on ten randomly selected plants in each replication on days to fifty per cent flowering (DF), node at which first flower appear (NF), number of pods per plant (NP), pod length (PL), pod width (PW), days to marketable maturity (DM), number of seeds or grains per pod (NS), Weight of 100 pods (WHP), shelling percentage, phenol content (PC), powdery mildew severity (PMS), pod yield

(kg/plot) (Y), Total Soluble Solids (TSS). For shelling percentage (SP) and 100-pod weight (WP) data was recorded on 25 and 100 randomly selected pods from each genotype in each replication at the time of 2nd harvest. Total phenol content of each genotype in each replication was recorded by Folin-ciocalteu procedure given by AOAC and average values were expressed in per cent. Powdery mildew severity in different genotypes was quantified by using disease severity scale described by Ghufuranulhaq *et al.* (2000) [4].

Table 1: list of pea genotypes and their source of availability

Genotype/variety	Source
Solan Nirog	UHF, Solan
Pb 89*	UHF, Solan
EC-598655	NBPGR, Regional Research Station, Phagli
EC-598615	NBPGR, Regional Research Station, Phagli
EC-598628	NBPGR, Regional Research Station, Phagli
EC-598677	NBPGR, Regional Research Station, Phagli
AP-2	CSAUAT, Kanpur
AP-4	CSAUAT, Kanpur
Pusa Pragati	IARI Regional Research Station, Katrain
KTP-101	IARI Regional Research Station, Katrain
KTP-102	IARI Regional Research Station, Katrain
14/PEVAR-2	IIVR, Varanasi
14/PEVAR-3	IIVR, Varanasi
14/PEVAR-4	IIVR, Varanasi
14/PEVAR-5	IIVR, Varanasi
14/PEVAR-6	IIVR, Varanasi
14/PEVAR-7	IIVR, Varanasi
12/PEVAR-1	IIVR, Varanasi
12/PEVAR-2	IIVR, Varanasi
12/PEVAR-3	IIVR, Varanasi
12/PEVAR-4	IIVR, Varanasi
12/PEVAR-5	IIVR, Varanasi
14/PMVAR-1	IIVR, Varanasi
14/PMVAR-2	IIVR, Varanasi
14/PMVAR-3	IIVR, Varanasi
14/PMVAR-4	IIVR, Varanasi
14/PMVAR-5	IIVR, Varanasi
12/PMVAR-1	IIVR, Varanasi
12/PMVAR-2	IIVR, Varanasi
12/PMVAR-3	IIVR, Varanasi
12/PMVAR-4	IIVR, Varanasi
12/PMVAR-5	IIVR, Varanasi
12/PMPMVAR-1	IIVR, Varanasi
12/PMPMVAR-2	IIVR, Varanasi
12/PMPMVAR-3	IIVR, Varanasi
12/PMPMVAR-4	IIVR, Varanasi
12/PMPMVAR-5	IIVR, Varanasi
Arka Ajit	IIVR, Varanasi
VP-233	IIVR, Varanasi
IP-3	IIVR, Varanasi
AP-3	IIVR, Varanasi
VRP-6*	IIVR, Varanasi
VRP-7	IIVR, Varanasi

*Check cultivars

Results and Discussion

The character wise mean performance of different genotypes is presented in table 2.

Days to 50 per cent flowering (number)

Days to 50per cent flowering ranged from 32.67 to 128 days with a total mean of 89.79 days. Minimum days to 50 per cent flowering were recorded in genotype 14/PEVAR-6 (32.67) which was statistically at par with 11 other genotypes

including one check cultivar viz. 14/PEVAR-2 (33.00), 14/PEVAR-3 (38.33), 14/PEVAR-5 (34.67), 14/PEVAR-7 (33.67), AP-3 (36.67), VRP-6 (35.00), 12/PEVAR-1 (38.67), 12/PEVAR-2 (35.67), 12/PEVAR-3 (35.67), 12/PEVAR-4 (37.33) and 12/PEVAR-5 (36.33). The other check variety i.e. Pb.89 recorded 113.33 days to 50 per cent flowering whereas, maximum days to 50 per cent flowering were observed in variety Pusa Pragati (128.00).

Node at which first flower appear (number)

Node number at which first flower appeared ranged from 7.10 to 15.13 with a mean of 11.69. A comparison of mean values of the genotypes for node to first flowering revealed that genotype 14/PEVAR-6 (7.10) recorded lowest node at which first flower appear which was statistically at par with 14 other genotypes including one check cultivar VRP-6 (7.37). Maximum node at which first flower appear was recorded in genotype 12/PMPMVAR-5 (15.13).

Number of pods per plant

Number of pods per plant ranged from 13.67 to 31.80 with an average value of 21.05. Maximum number of pods per plant were recorded in 14/PMVAR-3 (31.80) which was statistically at par with 2 other genotypes viz. 14/PMVAR-4 (27.33) and Pusa Pragati (27.07). The check cultivars recorded VRP-6 (18.30) and Pb.89 (24.97) number of pods per plant. The genotype 12/PEVAR-3 (13.67) recorded minimum number of pods per plant.

Pod Length (cm)

The data recorded on pod length (cm) ranged from 5.87 to 9.23cm with an average of 8.03cm. Maximum pod length was recorded in 14/PMVAR-3 (9.23) which was found statistically at par with 14 genotypes including one check cultivar viz. 14/PEVAR-2 (8.90), 12/PEVAR-1 (8.73), 12/PEVAR-4 (9.00), 14/PMVAR-1 (8.60), 14/PMVAR-2 (8.77), 14/PMVAR-4 (8.47), 14/PMVAR-5 (8.73), VRP-7 (8.53), 12/PMPMVAR-1 (8.77), Arka Ajit (8.73), Pb.89 (8.73), 12/PMVAR-3 (8.57), 12/PMVAR-4 (8.93) and KTP-102 (8.73). The other check cultivar VRP-6 recorded 7.63 cm pod length whereas, minimum pod length was observed in EC-598615 (5.87).

Pod Width (cm)

Pod width ranged from 0.94cm to 1.62cm with an average of 1.21cm. A comparison of mean values of the genotypes for pod width revealed that genotype 14/PEVAR-3 (1.62) recorded maximum pod width which was statistically at par with two other genotypes viz. VRP-7(1.52) and

12/PMPMVAR-4 (1.49). However, minimum pod length was recorded in genotype 12/PEVAR-4 (0.94). The check varieties recorded VRP-6 (1.09) and Pb.89 (1.10) pod width.

Number of seeds per pod

The observations on number of seeds per pod ranged from 5.40 to 8.93 with maximum number of seeds per pod recorded in genotype 14/PMVAR-3 (8.93) which is statistically at par with 14/PEVAR-2 (8.37), 12/PEVAR-1 (8.53), 12/PEVAR-4 (8.50) and 12/PMVAR-4 (8.47). Check cultivars VRP-6 and Pb.89 recorded 7.00, 8.03 number of seeds per pod, respectively. Minimum number of seeds were observed in genotype EC-598615 (5.40).

Shelling percentage (per cent)

The data on shelling percentage ranged from 38.10% to 66.18% with an average mean of 53.11%. Maximum shelling percentage was recorded in genotype 14/PMVAR-3 (66.18) which was statistically at par with 4 other genotypes viz. 12/PEVAR-1(59.13), 12/PEVAR-4 (60.39), 14/PMVAR-1 (59.46) and 12/PMPMVAR-1 (62.51). The check varieties recorded VRP-6 (50.20) and Pb.89 (58.54) shelling percent whereas, the genotype EC-598615 (38.10) recorded minimum shelling percentage.

Days to marketable maturity (number)

All the genotypes under study showed significant differences for this trait ranging from 49.67 to 156.67days with a mean of 120.03 days. Minimum days to marketable maturity were observed in genotype 14/PEVAR-2 (49.67) which is statistically at par with 11 other genotypes including one of the check variety viz. 14/PEVAR-3 (56.67), 14/PEVAR-5 (52.67), 14/PEVAR-6 (55.00), 14/PEVAR-7 (54.00), AP-3 (55.00), VRP-6 (52.67), 12/PEVAR-1 (54.33), 12/PEVAR-2 (51.33), 12/PEVAR-3 (52.00), 12/PEVAR-4 (53.33) and 12/PEVAR-5 (54.00). The check variety Pb.89 recorded 145.67 days to marketable maturity. Maximum days to marketable maturity were recorded in genotype AP-4 (156.67).

Table 2: Mean performance of 43 pea genotypes for 15 horticultural traits

Genotype	DF [#]	NF	NP	PL (cm)	PW (cm)	NS	Shelling (%)	DM	HD	WHP (g)	Y (kg/plot)	Y (q/ha)	TSS (%)	TP (%)	PMS (%)
14/PEVAR-2	33.00	7.13	20.53	8.90	1.20	8.37	58.13	49.67	22.67	344.67	3.10	68.96	9.23 (3.20)	0.45 (1.20)	51.83 (46.04)
14/PEVAR-3	38.33	7.73	16.17	7.23	1.06	6.73	49.14	56.67	20.33	212.00	2.30	51.18	10.57 (3.40)	0.43 (1.19)	60.84 (51.24)
14/PEVAR-4	40.00	8.23	16.60	7.87	1.36	7.17	56.45	61.33	23.33	248.67	2.45	54.52	12.10 (3.62)	0.48 (1.22)	53.96 (47.26)
14/PEVAR-5	34.67	7.27	14.90	7.43	1.29	6.97	48.19	52.67	20.33	212.67	2.39	53.19	8.40 (3.07)	0.64 (1.28)	38.31 (38.22)
14/PEVAR-6	32.67	7.10	14.07	7.93	1.04	7.33	54.23	55.00	18.33	224.33	2.12	47.11	10.00 (3.32)	0.42 (1.19)	63.41 (52.76)
14/PEVAR-7	33.67	7.23	19.17	7.97	1.08	7.47	52.90	54.00	23.00	254.00	2.44	54.30	13.87 (3.86)	0.49 (1.22)	47.39 (43.48)
AP-3	36.67	7.80	15.53	7.47	1.05	6.90	50.83	55.00	26.00	260.33	2.41	53.56	7.13 (2.85)	0.75 (1.32)	49.29 (44.57)
12/PEVAR-1	38.67	8.33	20.00	8.73	1.06	8.53	59.13	54.33	28.33	328.33	3.18	70.67	7.57 (2.93)	0.72 (1.31)	26.94 (31.23)
12/PEVAR-2	35.67	7.17	16.03	7.87	1.07	7.30	51.03	51.33	24.00	286.33	2.47	54.82	7.47 (2.91)	0.32 (1.15)	67.39 (55.16)
12/PEVAR-3	35.67	7.33	13.67	7.93	1.09	8.10	51.78	52.00	22.67	311.67	2.77	61.63	8.03 (3.01)	0.49 (1.22)	58.44 (49.86)
12/PEVAR-4	37.33	7.47	18.70	9.00	0.94	8.50	60.39	53.33	16.67	277.00	2.32	51.63	8.37 (3.06)	0.39 (1.18)	71.83 (58.06)
12/PEVAR-5	36.33	7.37	17.53	8.50	1.06	7.93	57.15	54.00	25.33	333.00	3.02	67.11	7.03 (2.83)	0.82 (1.35)	37.43 (37.67)
14/PMVAR-1	108.67	15.10	25.53	8.60	1.14	7.90	59.46	152.33	29.00	280.00	5.36	119.19	10.73 (3.41)	0.76 (1.33)	27.88 (31.86)
14/PMVAR-2	110.00	14.53	23.20	8.77	1.21	8.10	56.30	149.33	21.67	389.33	3.04	67.55	6.40 (2.72)	0.80 (1.34)	20.19 (26.66)
14/PMVAR-3	97.67	12.43	31.80	9.23	1.62	8.93	66.18	138.33	17.67	480.00	5.77	128.22	18.50 (4.42)	0.65 (1.29)	38.03 (38.05)
14/PMVAR-4	107.00	13.90	27.33	8.47	1.41	7.70	56.71	152.33	23.33	382.00	2.27	50.52	11.77 (3.57)	0.65 (1.29)	38.12 (38.10)
14/PMVAR-5	112.00	15.07	25.07	8.73	1.14	7.93	57.38	149.00	27.00	359.33	2.74	60.96	12.27 (3.64)	0.66 (1.29)	48.58 (44.17)
VRP-7	114.00	13.67	26.40	8.53	1.52	7.83	57.16	153.00	27.00	342.00	3.31	73.63	7.87 (2.98)	0.66 (1.29)	40.40 (39.45)
12/PMPMVAR-1	115.33	15.03	25.55	8.77	1.17	8.20	62.51	150.00	21.00	476.00	5.70	126.66	17.87 (4.34)	0.38 (1.17)	70.56 (57.13)
12/PMPMVAR-2	109.67	14.27	24.39	7.40	1.31	6.90	49.01	152.00	24.00	273.67	3.73	82.89	13.13 (3.76)	0.55 (1.25)	45.69 (42.50)
12/PMPMVAR-3	114.00	14.97	18.85	7.87	1.23	7.27	52.50	143.00	27.33	429.67	2.60	57.71	7.70 (2.95)	0.73 (1.32)	29.57 (32.83)

12/PMPMVAR-4	108.67	14.17	24.17	8.03	1.49	7.40	52.88	146.00	22.67	336.67	4.72	104.96	14.03 (3.85)	0.72 (1.31)	34.15 (35.66)
12/PMPMVAR-5	115.33	15.13	23.30	8.37	1.36	7.67	54.58	147.33	28.00	432.67	3.68	81.78	13.57 (3.82)	0.74 (1.32)	32.24 (34.55)
VP-233	112.33	14.87	23.94	8.27	1.36	7.77	54.41	150.00	23.67	458.67	4.69	104.22	14.03 (3.88)	0.62 (1.27)	38.99 (38.61)
Arka Ajit	113.33	14.63	23.67	8.73	1.28	8.13	57.54	144.67	27.67	349.00	3.49	77.63	14.43 (3.93)	0.86 (1.36)	10.90 (19.07)
Solan Nirog	110.00	14.20	25.17	6.77	1.16	6.13	44.71	152.00	25.00	236.33	2.57	57.11	7.80 (2.97)	0.92 (1.39)	7.92 (16.31)
IP-3	113.33	15.00	18.01	7.10	1.22	6.50	47.03	149.67	24.67	258.33	2.85	63.33	13.93 (3.85)	0.50 (1.23)	51.64 (45.93)
12/PMVAR-1	109.00	13.60	25.57	8.07	1.13	7.40	53.21	140.00	23.67	349.33	3.47	77.11	15.37 (4.04)	0.43 (1.19)	61.30 (51.52)
12/PMVAR-2	116.00	13.73	24.23	7.80	1.32	7.17	51.38	150.00	24.00	259.33	4.71	104.74	10.03 (3.31)	0.48 (1.22)	54.04 (47.30)
12/PMVAR-3	111.67	9.73	24.63	8.57	1.36	7.93	52.24	149.67	23.33	234.00	3.73	82.89	12.60 (3.68)	0.79 (1.34)	25.85 (30.42)
12/PMVAR-4	119.67	11.97	23.93	8.93	1.24	8.47	57.92	151.33	26.67	226.67	4.06	90.22	13.67 (3.83)	0.48 (1.22)	62.75 (52.43)
12/PMVAR-5	114.00	14.10	23.03	8.17	1.23	7.57	52.47	150.33	27.67	269.67	4.66	103.63	16.47 (4.17)	0.58 (1.26)	43.35 (41.11)
KTP-101	109.33	10.97	25.87	8.07	1.15	7.37	51.06	147.33	25.33	324.67	4.18	92.96	10.17 (3.33)	0.71 (1.31)	49.97 (44.96)
KTP-102	110.33	9.73	21.50	8.73	1.13	8.13	57.41	154.00	23.67	231.33	2.76	61.41	11.63 (3.55)	0.79 (1.34)	30.50 (33.83)
EC-598655	118.33	13.00	14.27	7.20	1.40	6.67	47.65	148.33	27.00	328.33	3.51	78.08	7.80 (2.96)	0.85 (1.36)	16.01 (23.51)
EC-598615	125.00	12.90	17.80	5.87	1.18	5.40	38.10	156.33	23.67	210.67	1.36	30.30	8.53 (3.08)	0.90 (1.38)	11.34 (19.59)
EC-598628	104.00	11.97	16.70	7.77	1.20	7.10	47.12	138.00	25.33	298.67	1.50	33.40	7.60 (2.93)	0.92 (1.39)	6.93 (15.25)
EC-598677	109.33	12.63	18.40	7.80	1.21	7.20	50.37	142.67	25.00	265.33	1.68	37.41	6.67 (2.77)	0.89 (1.37)	15.27 (22.63)
AP-2	121.33	11.90	15.51	6.57	1.19	6.10	42.25	146.67	23.67	349.33	3.40	75.63	14.90 (3.98)	0.65 (1.28)	39.45 (38.90)
AP-4	123.00	14.50	14.23	6.77	1.23	6.10	42.83	156.67	23.67	310.00	2.36	52.52	11.70 (3.56)	0.59 (1.26)	42.70 (40.78)
Pusa Pragati	128.00	13.10	27.07	7.93	1.09	7.27	53.17	153.33	24.00	288.67	4.15	92.30	12.30 (3.64)	0.72 (1.31)	48.03 (43.85)
VRP-6*	35.00	7.37	18.30	7.63	1.09	7.00	50.20	52.67	22.33	315.33	2.63	58.44	11.53 (3.54)	0.69 (1.30)	34.57 (35.95)
Pb.89*	113.33	14.17	24.97	8.73	1.10	8.03	58.54	145.67	22.67	347.00	5.59	124.29	16.93 (4.22)	0.70 (1.30)	43.88 (41.46)
Mean	89.79	11.69	21.05	8.03	1.21	7.43	53.11	120.03	24.01	311.28	3.29	73.03	11.20 (3.46)	0.65 (1.28)	40.65 (39.06)
SE (m)±	2.55	1.08	1.85	0.26	0.07	0.26	2.58	2.58	1.52	17.78	0.32	7.06	0.13	0.01	1.75
C.D (0.05)	7.19	3.05	5.21	0.72	0.19	0.72	7.27	7.26	4.29	50.10	0.90	19.89	0.35	0.02	4.92

*Check cultivars

#where DF- Days to 50% flowering, NF- node at which first flower appeared, NP- number of pods per plant, PL- pod length, PW- pod width, NS- number of seeds per pod, DM- days to marketable maturity, HD- harvest duration, WHP- weight of 100 pods, Y- yield, TSS- total soluble solids, TP- total phenols, PMS- powdery mildew severity

Harvest Duration (days)

All the genotypes under study showed significant differences for harvest duration ranging from 16.67 days to 29 days with mean of 24.01. The prolonged harvest duration was recorded in genotype 14/PMVAR-1 (29.00) which was statistically at par with 15 other genotypes. The check cultivars VRP-6 and Pb.89 recorded 22.33 and 22.67 days harvest duration, respectively, while the genotype 12/PEVAR-4 (16.67) recorded minimum harvest duration.

Weight of 100 pods (g)

Weight of 100 pods ranged from 210.67 g to 480 g with an average mean of 311.28g. The genotype 14/PMVAR-3 (480.00) recorded maximum weight of 100 pods which was at par with 3 other genotypes viz. 12 /PMPMVAR-1 (476.00), 12/PMPMVAR-5 (432.67) and VP-233 (458.67). Minimum weight of 100 pods was recorded in genotype EC-598615 (210.67). The check varieties VRP-6 and Pb.89 recorded 315.33g, 347.00g weight of 100 pods, respectively.

Pod yield (kg/plot)

All the genotypes under study showed significant differences for pod yield (kg/plot) ranging from 1.36 kg to 5.77kg/plot with mean pod yield of 3.29kg/plot. Maximum pod yield per plot was recorded in genotype 14/PMVAR-3(5.77) which was statistically at par with 3 other genotypes including one check variety viz. 14/PMVAR-1(5.36), 12/PMPMVAR-1 (5.70) and Pb.89 (5.59). The check variety VRP-6 recorded 2.63kg pod yield per plot while minimum yield per plot was recorded in genotype EC-598615 (1.36).

Pod yield (q/ha)

Pod yield (q/ha) was recorded in range of 30.30 to 128.22 q/ha with a mean of 73.03q/ha. Maximum pod yield per hectare was recorded in genotype 14/PMVAR-3(128.22) which was statistically at par with 3 other genotypes including

one check variety viz. 14/PMVAR-1(119.19), 12/PMPMVAR-1 (126.66) and Pb.89 (124.29). The check variety VRP-6 recorded 58.44q pod yield per plot while minimum yield per plot was recorded in genotype EC-598615 (30.30).

Total Soluble Solids (per cent)

All the genotypes under study showed significant differences for total soluble solids ranging from 6.40 to 18.50 with a mean of 11.20%. The maximum total soluble solids were recorded in genotype 14/PMVAR-3 (18.50) which was statistically at par with 3 other genotypes including one of the check variety viz. 12/PMPMVAR-1 (17.87), Pb.89 (16.93) and 12/PMVAR-5 (16.47). Other check variety VRP-6 recorded 11.53 per cent total soluble solids whereas genotype 14/PMVAR-2 (6.40) recorded minimum total soluble solids.

Total phenols (per cent)

The observations recorded on total phenols ranged from 0.32 to 0.92 with a mean of 0.65. A perusal of data on this trait revealed that maximum total phenols were recorded in EC-598628 (0.92) and Solan Nirog (0.92) which was found statistically at par with 2 other genotypes viz. EC-598615 (0.90) and EC-598677 (0.89). Minimum total phenols were recorded in genotype 12/PEVAR-2 (0.32). The check varieties VRP-6 and Pb.89 recorded 0.69, 0.70 per cent total phenols, respectively.

Powdery Mildew Severity (per cent)

The data recorded on powdery mildew severity (per cent) varied from EC-598628 (6.93) to 12/PEVAR-4 (71.83). Three genotypes were found to be at par with the most resistant genotype EC-598628 viz. Arka Ajit (10.90), Solan Nirog (7.92) and EC-598615 (11.34). The check varieties VRP-6 and Pb.89 recorded 34.57, 43.88 per cent powdery mildew, respectively. Both these checks are found moderately susceptible to powdery mildew

Conclusion

Based on the mean performance of genotypes it can be concluded that genotypes 14/PMVAR-3, 14/PEVAR-6, 14/PEVAR-2, 14/PMVAR-1 and EC-598628 were superior

over other entries including standard checks w.r.t. yield, quality and other important horticultural traits. 14/PMVAR-3 was found superior to checks for most of studied traits, may be released as pureline after multi-location testing at different locations of state. Genotype 14/PMVAR-1 had recorded yield comparable to check cultivar and also showed moderately resistant reaction to powdery mildew disease. All these genotypes can also be exploited in future breeding programmes for their superior traits.

References

1. Blixt S. *Pisum*. In: Frankel OH and Besset E (eds). Genetic resources in plants, their exploration and conservation. Blackwell Scientific Publications, Oxford, 1970, 321-325.
2. Ellis THN, Hofer JI, Timmerman-Vaughan GM, Coyne CJ and Hellens RP. Mendel 150 years on. Trends Plant Science 2011;16:590-596.
3. Ghobary HMM. Study of relationship between yield and some yield components in garden pea (*Pisum sativum* L.) by using correlation and path analysis. Journal of Agricultural Research 2010;36:351-360.
4. Ghufranalhaq, Hafeezurrehman and Akhtar I. Resistance in summer pea varieties to powdery mildew. Journal of Agriculture 2000;16(3):339-342.
5. Sharma BB. Combining ability and gene action studies for earliness in garden pea (*Pisum sativum* L.). M Sc Thesis, GBPUAT, Pantnagar, 2010, 10.
6. Simioniuc D, Uptmoor R, Friedt W, Ordon F. Genetic diversity and relationships among pea cultivars revealed by RAPDs and AFLPs. Plant Breed 2002;121:429-435.