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Estimation of Snap Melon (*Cucumis melo* var. *Momordica*) Landraces for Growth, Yield and Morphological Characters

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ABSTRACT

The Present Study was carried out to evaluate the performance of Snap melon genotypes for growth, yield and morphological related attributes at Field Experimentation Center, Department of Genetics and Plant Breeding, SHUATS, Prayagraj. 20 landraces were evaluated on the basis of morphological characters, among the landraces used for investigation; early harvest was obtained from RSCP-556 (71.98) followed CAIV-40 (71.02). Longer fruits were observed in cultivar RSCP-556 (41.02), followed by RSCP-564 (33.08) and CAIV-50 (33.05). The highest average fruit weight was cultivar RSCP-556 (1.85 kg), followed by CAIV-40 (1.60 kg) and DSKP-567 (1.54 kg). Smaller fruit sizes were observed with ASKP-555 (0.84 kg), followed by CSAK-39 (0.87 kg).The landraces excelled in highest fruit yield/plant was RSCP-556 (11.50) followed by KSKP-553 (10.80).

Keywords Snap melon, Cultivar, Yield, Growth, Landraces.

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INTRODUCTION

India has seen a significant increase in horticultural production over the past few years. Area expansion has made significant progress, leading to increased production. Than Over the past decade, the area devoted to horticulture has increased by about 3% per year and production increased by 5.4%. In 2016-17, the output of horticultural crops was approximately 295.2 million tons on an area of 24.9 million hectares. India is the second largest producer of vegetables besides China. Vegetable output increased from 58.5 million VND tons to 175 million tons from 199192 to 2016-17. In 2016-17, the regions under vegetables are estimated at 10.3 million hectares with an output of 175 million tons and yield of 17.01 tons/ha in India. During this period, the total vegetable production is highest in the case of Uttar Pradesh, followed by West Bengal (Statistics of Cultivation in India, GOI). Per capita vegetable consumption in India should be 300g per day according to ICMR introduction. However, the per capita consumption of vegetables is only 145 g. Therefore, there is the need to increase vegetable production by planting with high yield genotype/ variety/hybrid with high nutritional value by applying improved production technologies.

Melon is an important horticultural plant belonging to the cucurbit family. India is one of the secondary origins of *Cucumis melo*, of which cultivated forms include 40 species (Whitaker and Davis 2008). There are several varieties of local melons grown in different regions of India. Cultivation is mainly limited to Gujarat in the West and West Bengal in the East. In northern India, the ready-to-eat melon known as "Phoot" is known as a type of pickle and in Kerala it is known locally as "Pottuvellari". Cantaloupe has many uses depending on the type and maturity of the fruit. Sweet varieties are eaten as a dessert, not sweets are used as a vegetable and young fruits are eaten raw, pickled or cooked. The fruit contains a lot of vitamin C, sugar, minerals and fiber.

Per capita vegetable consumption in India should be 300g per day according to ICMR introduction. However, the per capita consumption of vegetables is only 145 g. Therefore, there is the need to increase vegetable production by planting with high yield genotype/variety/hybrid with high nutritional value by applying improved production technologies potential and also to improve quality traits, pests and disease rate. This study was done to collection and characterization of Snap melon genotypes in different regions of Allahabad and also to assess the change exist in the germ in terms of morphology, yield and quality character. As a cross-pollination plant, there are huge differences exist between cultures. So, recognize characters that are inherited quantitatively from available genetic material can be an effective means of obtaining genetic variation in melons.

MATERIALS AND METHODS

The experiment was conducted from 2018 to 2020 at the Research Station, Department of Genetics and Plant Breeding at SHUATS, Prayagraj. A total of 20 accessions, including checks, were collected from different regions of Prayagraj (Table 1). The experiment was set up with a Randomized Block Design with 3 replications. At a distance of 1.5×0.9 m under each replication, three pits were raised separately for each accession. The 20 local varieties included check; each replication were raised in the three pits and two to three seeds were sown in each pit. Cultural and management practices are adopted according to the package of practices recommended by the Department of Agriculture, SHUATS.

Table 1. Sources of various Snap melon genotypes used in the study.

Denomination no.	Name of the varieties/ landraces	Source
SSJP-551	Santlal Desi Kakdi	Local Landraces
ASKP-552	Desi Kakdi Ambika -1	Local Landraces
KSKP-553	Kaushlesh Desi Kakdi	Local Landraces
ASTP-554	Anurag Desi Kakdi	Local Landraces
ASKP-555	Desi Kakdi Ambika	Local Landraces
RSCP-556	Ramraj Desi Kakdi	Local Landraces
MSSP-557	Mahendra Desi Kakdi	Local Landraces
BSKP-558	Bholanath Desi Kakdi	Local Landraces
ASTP-559	Ankit Desi Kakdi-1	Local Landraces
ASNP-559	Anurag Desi Kakdi-1	Local Landraces
KSNP-561	Kamlesh Desi Kakdi	Local Landraces
BSKP-562	Bholanath Kakdi	Local Landraces
ASTP-563	Ankit Kakdi	Local Landraces
RSCP-564	Ramraj Kakdi	Local Landraces
DSKP-567	Dharmraj Kakdi	Local Landraces
CAIV-40	Chandra Prakash Desi Kadi-1	Local Landraces
CSAK-39	Chandra Prakash Kakadi	Local Landraces
Check-1	M.K 70 Faizabadi	Check variety
Check-2	PB-977	Check variety
Check-3	Big – B	Check variety

The observation was recorded from five randomly selected plants in each genotype. Morphological characters like Days to 50% flowering, Days to 1st male flowering, Days to 1st female flowering, Nodal lengths 1st male flowering, Nodal lengths 1st female flowering, Vine length, Number of fruits per plant, Fruit length, Fruit width, Days to 1st harvest, Number of seeds per fruit, Fruit flesh thickness, Seed length, Seed Width, Test weight.The significant differences test at 1% and 5% of probability was used to test the significance among the mean values.

Statistical analysis

The experimental data recorded were subjected to suitable statistical analysis for the parameters, viz., analysis of variance, range, mean, critical difference and coefficient of variation.

RESULTS AND DISCUSSION

Significant differences between local varieties were

Table 2a. Mean performance for quantitative parameters in 20 varieties of Snap melon year (Pooled data).

Varieties	Days to 50% flowering	Days to 1st male flowering	Days to 1st female flowering	Nodal lengths 1st male flowering	Nodal lengths 1st female	Vine lengths	Number of fruits per plant	Fruit length	Fruit width	Days to 1st harvest	Number of seeds per fruit	Fruit flesh thickness
SSJP-551	33.04	32.47	34.44	3.26	4.12	219.86	2.72	27.98	24.30	62.88	580.81	5.39
ASKP-552	38.73	39.65	41.12	2.43	2.79	157.86	1.83	18.58	20.36	78.45	129.28	2.07
KSKP-553	33.15	27.83	31.77	3.25	4.19	233.47	3.23	27.04	27.52	63.44	459.24	5.61
ASTP-554	32.15	32.82	33.19	4.02	5.14	247.50	2.98	26.09	27.31	64.21	403.10	5.31
ASKP-555	31.83	31.88	34.47	3.73	5.13	223.27	2.76	29.40	27.92	65.09	495.35	6.02
RSCP-556	28.82	26.24	28.11	4.63	6.20	273.04	4.9	41.02	48.22	51.08	828.46	6.88
MSSP-557	30.04	32.95	35.63	3.96	4.36	213.83	2.76	28.33	30.32	63.59	460.80	5.51
BSKP-558	30.38	28.12	30.39	3.75	3.64	216.02	3.38	27.76	26.31	64.52	351.12	5.75
ASTP-559	32.04	32.13	33.83	4.00	5.20	234.77	3.78	25.14	25.27	66.53	552.05	5.51
ASNP-559	32.37	33.24	34.11	3.02	4.55	245.99	2.85	22.61	27.14	68.01	326.11	4.06
KSNP-561	31.82	31.62	37.37	4.29	4.06	221.63	3.67	23.55	41.52	71.94	276.71	3.92
BSKP-562	34.27	32.80	37.89	3.98	4.79	222.25	3.80	30.49	41.05	64.61	254.6	3.2
ASTP-563	32.49	29.08	36.13	3.11	4.71	219.04	3.72	30.20	42.9	74.41	286.19	3.76
RSCP-564	32.28	33.52	36.67	3.74	5.05	231.38	3.56	33.08	40.49	61.2	217.98	3.90
DSKP-567	33.28	31.07	36.92	3.52	5.72	240.91	3.87	32.61	43.92	59.21	184.63	5.55
CAIV-40	31.82	31.38	33.65	2.62	4.61	201.01	4.05	32.09	42.13	63.83	430.33	3.58
CSAK-39	34.4	31.63	33.91	3.24	4.69	208.69	2.89	28.08	42.21	70.21	262.86	3.18
Check-1	33.96	33.83	33.93	2.99	4.67	194.60	2.67	23.85	41.16	60.48	225.03	3.79
Check-2	35.07	35.07	33.96	2.59	4.08	218.03	4.00	33.05	45.69	71.02	239.44	3.36
Check-3	29.85	30.18	37.75	2.30	5.22	222.19	3.94	29.91	39.77	64.96	379.32	3.68
Mean	32.58	31.87	34.76	3.42	4.64	222.26	3.36	28.54	35.27	65.48	367.17	4.50
CV.	6.70	9.02	8.83	16.32	19.99	16.84	33.97	17.82	24.46	79.51	30.42	40.62
SE.	0.72	0.95	1.02	0.18	0.31	12.48	0.38	1.69	2.87	32.29	37.23	0.61
CD 5%	2.03	2.67	2.86	0.52	0.86	34.87	1.06	4.74	8.03	90.22	104.04	1.70
CD 1%	2.68	3.53	3.77	0.68	1.14	46.05	1.40	6.25	10.61	119.12	137.37	2.25

observed for all traits. Earliness is one of the main attributes and is measured by the node where the first male and female flower appears. The strain ASKP-552 produced male flowers at the lowest node (2.43), followed by CSAK-39 (2.54). The ASKP-552 strain produced female flowers at the lowest node (2.79), followed by SSJP-551 (4.12), (Table 2a). Similar trend of earliness was reported by Rakhi and Rajamony (2005), Venkatesan *et al.* (2016) in muskmelon and Priya (2012) in Snap melon. Early harvesting is also one of the important and desirable properties for crop improvement programs. The variety ASKP-552 (78.45) recorded early harvest followed by ASTP-563 (74.41) and KSNP-561(71.94), (Table 2a).

This is consistent with the results of Ahmed *et al.* (2005), Rakhi and Rajamony (2005). Fruit length indirectly increases the yield of all kinds of crops. Therefore, it is considered to be an important feature when choosing melon varieties. Longer fruits were observed in cultivar RSCP-556 (41.02), followed by RSCP-564 (33.08) and CAIV-50(33.05), (Table 2a). Priya (2012), Rakhi and Rajamony (2005), Pandey *et al.* (2010) pointed out that there is a similar tendency in fruit length results. Larger perimeter fruit lengths were observed with genotype RSCP-556 (48.22), followed by ASKP-552 (20.36) with shorter lengths and CAIV-40 (45.69) with longer lengths (Table 2a). Similar trends in results were reported by Venkatesan *et al.* (2016) report on snap melon. The highest average fruit weight was cultivar RSCP-556 (1.85), followed by CAIV-40 (1.60) and DSKP-567 (1.54), (Table 2b). Smaller fruit sizes were observed with ASKP-555 (0.84), followed by CSAK-39 (0.87), (Table 2a). A similar pattern was discovered by Rad *et al.* (2010) and Priya (2012). In terms of fruit / plant numbers, the RSCP-556 (4.90) and CAIV-40 (4.00) varieties were the best performing varieties of the 20 varieties, (Table 2a). Maximum flesh thickness was observed with cultivar RSCP-556 (6.88), followed by ASKP-555 (6.02) and BSKP-558 (5.75), (Table 2a). This supports the results of Priya (2012) and Rakhi and Rajamony (2005). Seed / plant numbers are another important property that contributes to yield. No.

Table 2b. Mean performance for quantitative parameters in 20 varieties of Snap melon year (Pooled data).

Varieties	Avg fruit weight (kg/g)	Fruit yield/ (kg/g)	Seed length	Seed width	Test weight
SSJP-551	1.36	7.36	7.57	4.42	8.87
ASKP-552	0.70	5.52	6.25	2.8	4.96
KSKP-553	2.28	10.80	6.79	3.98	10.97
ASTP-554	0.96	6.20	8.86	3.84	8.28
ASKP-555	0.84	5.30	7.73	4.13	19.93
RSCP-556	1.85	11.50	9.47	17.32	22.00
MSSP-557	0.94	8.20	8.16	4.10	9.31
BSKP-558	1.20	6.60	7.32	4.01	13.43
ASTP-559	1.37	6.00	7.70	3.45	8.83
ASNP-559	1.15	8.50	6.99	12.96	11.91
KSNP-561	1.20	5.90	7.78	4.07	10.98
BSKP-562	1.37	9.20	8.75	10.66	9.16
ASTP-563	1.15	10.90	7.64	7.79	6.99
RSCP-564	1.20	11.30	8.36	11.34	12.21
DSKP-567	1.30	10.00	8.85	7.83	12.24
CAIV-40	0.92	7.90	7.21	10.6	10.1
CSAK-39	1.54	5.20	7.52	7.66	12.38
Check-1	1.11	9.30	7.56	6.81	9.89
Check-2	1.48	5.40	8.37	7.49	7.71
Check-3	1.25	9.51	7.72	8.97	6.85
Mean	1.25	8.02	7.83	7.21	10.85
CV	0.29	9.57	15.28	80.71	66.55
SE	1.13	3.16	0.39	1.94	2.40
CD 5%	1.59	1.02	1.11	5.42	6.72
CD 1%	0.61	1.21	1.47	7.16	8.88

of Seeds/plants were highest in genotype RSCP-556 (828.46), followed by SSJP-551 (580.81) and ASKP-555 (495.35), (Table 2b). A similar result pattern was observed by Dhillon *et al.* (2007). In terms of fruit yield/ plant, cultivar RSCP-556 (11.50) out performed fruit yield/ plant compared to the reference cultivar. The highest marketable fruit/plant yields recorded from these varieties may be due to the presence of the maximum number and average weight of fruits/ plants (Table 2b). These two properties directly affect the marketable fruit yield / plant obtained from Bitter Gourd of Sidhu and Pathak (2016) and Snap melon of Priya (2012).

CONCLUSION

In this study, all the characters exhibited high variation and from this it was concluded that there is significant differences among the landraces under study. Considering the diverse nature of the material, the genotypes under investigation in the present study had the greater quantity of variation for all parameters and there is possibility for improvement of these traits by selection.

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