Studies ongrowthcharacteristicsand quality traits of different variety/ genotypes of brinjal (*Solanum melongena* L.)

Abstract

The present study was conducted to evaluate 20 variety/ genotypes of brinjal for quality parameters. The sample was collected from vegetable trial field of Chandra Shekhar Azad University of Agriculture and Technology, Kanpur as well as after grading of the sample and the quality analysis in the laboratory was conducted as per standard procedures in the laboratory of the department of agricultural biochemistry. A significant variation was detected in all traits studies. There was considerable variability among varieties. Among the growth characteristics data on the days to 50% flowering significantlyvaried from 31.78-40.42, plant height range from 64.05-82.65 cm, no. of branches per plant ranges from 9.0-14.5. Similarly among the quality traits such as ash content ranged from 9.71-11.39 %, fat content varied from 0.23- 0.37 %, fibre content ranged from 1.29-1.73 %.

Key word: Days to 50% flowering, Plant height, No. of branches per plant, Ash, Fat, Fibre.

Introduction:

Eggplant or brinjal (*Solanum melongena* L.; 2n = 2x = 24) is important vegetable crop and is considered a rich member of the family *Solanaceae*, which contains approximately 1300 species it can be grown in diversified climatic conditions of various ecological regions. It possesses high species richness with considerable flexibility of phenotypic adaptability that made the species the most important vegetable economically. Eggplant is a general term for various Solanum species cultivated for their fruits, including the East Asian aubergine *(S. melongena* L.) and the two African native eggplants, Scarlet *(S. aethiopicum* L.) and Gboma *(S. macrocarpon* L.).Brinjal or eggplant (*Solanum melongena* L.) is one of the important solanaceous vegetable crop having diploid chromosome number 2n=2x=24. One hundred gram edible portion of brinjal fruit contains 92.7% moisture, 24.0% calories, 4.0% carbohydrates, 1.4 g protein, 0.3 g fats, 1.3 g fibres, 124.0 (I.U.) vitamin A and 12.0 mg vitamin C **(Chen and Li, 1997).** It also contains 52.0 mg chlorine, 47.0 mg phosphorus, 44.0 mg sulphur and other minerals **(Aykroyd, 1963).** Plant height (cm), days to 50% flowering, primary branches per plant, fruit weight (g), fruit circumference (cm), fruits per plant, fruit length (cm),) were estimated according to **Searle (1961).**Brinjal has high nutritive value when compared with tomato. It contains high amount of carbohydrates (6.4%), protein (1.3%), fat (0.3%), calcium (0.02%), phosphorus (0.02%), iron (0.0013%) and other mineral matters **(Kandoliya*et al*., 2015).**

Materials and methods:

Plant height (cm):

The height of the five randomly selected individual plants from ground to tip were measured in centimetre at final harvest stage, when the plant attained maximum growth and replication wise the average plant height of each genotype was calculated.

Days to 50% flowering:

The number of days taken from the date of transplanting to the opening of first flower on 50% of the plants of each genotype in each replication was recorded as date and calculated in days.

Number of fruits per plant:

Number of edible fruits from five tagged plants were counted at each picking and summed up for all the pickings and divided by five to get the number of fruits per plants.

Ash content:

Ash content was determined by the method as described by **Hart and Fisher, (1971).**

Fat content:

Fat extractable lipid content in brinjal sample was determined by Soxhlet Extraction procedure using petroleum ether of boiling point 40-60 0C for six hours in a flash **(A.O.A.C., 1970)**. Fat content was calculated using the following formula:

$$Ether\ extract\ percentage\ in\ brinjal\ sample = \frac{weight\ of\ extracy\ (g)}{weight\ of\ sample} \times 100$$

Fibre content:

The fibre content in brinjal was analysed by the method as described by **Hart and Fisher (1971).**

Statistical Analysis:

All sample extract were prepared an analysis done using a Randomized Block Design (RBD) at 5% level of critical difference. Analysis of variance (ANOVA) for the design was carried out to determine the significance of differences among difference treatments.

Results and Discussion

The data pertaining to days to 50% flowering of genotype cultivarsfor brinjal genotypes are presented in the Table 1. It was observed that the days to 50% flowering. Thegenotype C-9013 showed the maximum days to 50% flowering (40.42)followed bygenotypes KS-453 (39.31), KS-556 (38.86) and C-8805 (38.37).The minimum days to 50% flowering was noted in genotype-KS-331(31.78). The days to 50% flowering C-9013 were significantly superiorthan KS-331. The results are supported by **Madhavi*et al.*, (2017**). Data regarding on Plant height of various cultivars of some brinjalgenotypes are presented in the Table 1. It was observed that the Plant height. The genotype C-9012showed the maximum plant height (82.65 cm) followed by genotype KS-554(79.95 cm), KS-224 (78.10 cm) and C-9015 (77.75 cm). The minimum plant height wasnoted in genotype KS-453 (64.05 cm). The plant height C-9011weresignificantly superior than KS-453. These results are in close agreementwith the reports **Tripathy *et al.*, (2017)**. Data regarding on No. of branches per plant of various cultivars ofsome brinjal genotypes are presented in the Table 2. It was observed that the no. of branches perplant. The genotype KS-556 showed the maximum no. of branches per plant(14.99) followed by genotype C-7864-1 (14.5), C-9006 (14.16) and C- 9011(13.83). The minimum No. of branches per plant was noted in genotype C-8502-1 (07.50). The No. of branches per plant KS-556 were significantlysuperior than C-8502-1. These results are in close agreement with the reports**Rahman *et al.*, (2016).**

Table 1: The data pertaining to days to 50% flowering of genotype cultivars for brinjal

S.N.	Varieties	Days to 50% flowering		Pooled mean	Plant height (cm)		Poole d mean	No. of branches per plant		Pooled mean
		2021	2022		2021	2022		2021	2022	
1	KS-235	34.32	32.23	33.275	65.4	67.6	66.5	08	10	9
2	KS-454	36.54	38.97	37.755	67.5	65.0	66.25	09	11	10
3	KS-456	31.22	35.43	33.325	70.7	67.9	69.3	11	14	12.5
4	KS-453	39.87	38.76	39.315	62.3	65.8	64.05	13	11	12
5	KS-224	36.54	38.78	37.66	78.9	77.3	78.1	09	12	10.5
6	KS-554	34.56	35.67	35.115	80.5	79.4	79.95	10	12	11
7	KS-555	37.65	36.76	37.205	78.2	76.5	77.35	13	11	12
8	KS-556	38.97	38.75	38.86	72.0	70.9	71.45	15	13	14
9	KS-331	31.23	32.34	31.785	68.2	67.6	67.9	08	10	9
10	C-9011	33.76	34.55	34.155	67.9	69.8	68.85	13	11	12
11	C-9012	33.08	35.46	34.27	83.4	81.9	82.65	10	12	11
12	C-9013	40.98	39.87	40.425	76.0	74.3	75.15	09	11	10
13	C-9015	37.65	36.72	37.185	78.9	76.6	77.75	08	10	9
14	C-9006	33.21	34.27	33.74	73.8	71.2	72.5	13	12	12.5
15	C-8502-1	36.75	34.56	35.655	67.5	65.7	66.6	15	14	14.5
16	C-8841	38.89	36.78	37.835	75.9	74.2	75.05	09	10	9.5

17	C-5623	35.65	37.62	36.635	69.8	70.9	70.35	10	11	10.5
18	C-7864-1	32.16	33.45	32.805	75.6	73.5	74.55	15	14	14.5
19	C-8805	39.09	37.65	38.37	72.3	70.9	71.6	11	13	12
20	Azad Kranti	37.65	38.97	38.31	77.7	76.5	77.1	10	12	11
	Mean	**35.9885**	**36.3795**	**36.184**	**73.125**	**72.175**	**72.65**	**10.95**	**11.7**	**11.325**
	S.E. m±	**4.68**	**4.56**	**4.72**	**9.21**	**9.3**	**9.23**	**1.25**	**1.44**	**1.39**
	C.D. (5%)	**13.41**	**13.07**	**13.52**	**26.4**	**26.65**	**26.45**	**3.58**	**4.13**	**3.99**

Data on ash content of various cultivars of some genotypes of brinjal arepresented in the table. It is shown that the data on the ash content varied from 9.71-11.39%. The genotype C-8805 showed the maximum ash content(11.395%) followed by genotype- Azad Kranti (11.33%), C-8841(11.28%) andC-9012 (11.17%). The minimum ash content was noted in genotype KS-235(9.715%). The genotype of C-8805 superior than genotype of KS-235. Theresults are supported by **Khan *et al.*, (2015)**.Data on fat content of various cultivars of some genotypes of brinjal arepresented in the Table. Itis shown that the data on the fat content varied significantly from 0.23-0.37 %.The genotype of Azad Kranti showed the maximum fat content (0.37 %) followedbygenotype- C-9006 (0.36 %), KS-555 (0.35 %) and C-9012 (0.34 %). Theminimum fat content was noted in genotype of C-5623 (0.24). The genotypeof Azad Kranti superior than the genotype of C-5623. The results aresupported by **Tettehe*t al.*, (2022)**. Data on fibre content of various cultivars of some genotypes of brinjalare presented in the Table.It is shown that the data on the fibre content varied significantly from 1.29-1.73 %. The genotype of KS-456 showed the maximum fibre content (1.73 %)followed by genotype- C-9013(1.63 %), C-8841 (1.58 %), and Azad Kranti (1.57 %).The minimum fibre content was noted in genotype of C-9012(1.29 %). Thegenotype of KS-456 superior than the genotype of C-9012. Similar resultswere reported by **Rahman *et al.*, (2016)**

Table 2 : Data on quality traits of various cultivars of some genotypes of brinjal

S.N.	**Varieties**	**Ash Content (%)**		**Pooled mean**	**Fat (%)**		**Pooled mean**	**Feber (%)**		**Pooled mean**
		2021	**2022**		**2021**	**2022**		**2021**	**2022**	
1	KS-235	09.56	09.87	9.715	0.26	0.35	0.305	1.5	1.3	1.4
2	KS-454	10.32	10.43	10.375	0.32	0.28	0.30	1.4	1.4	1.4
3	KS-456	10.87	10.76	10.815	0.38	0.32	0.35	1.8	1.6	1.7
4	KS-453	11.23	11.09	11.161	0.27	0.31	0.29	1.6	1.4	1.5
5	KS-224	10.87	10.65	10.76	0.29	0.35	0.32	1.3	1.3	1.3

6	KS-554	09.98	10.21	10.095	0.34	0.31	0.325	1.7	1.2	1.45
7	KS-555	11.37	10.95	11.16	0.31	0.37	0.331	1.2	1.6	1.4
8	KS-556	10.76	09.83	10.295	0.28	0.29	0.285	1.8	1.3	1.55
9	KS-331	10.54	10.93	10.735	0.29	0.26	0.275	1.3	1.4	1.35
10	C-9011	09.90	09.87	9.885	0.25	0.29	0.27	1.4	1.5	1.45
11	C-9012	11.21	11.13	11.17	0.36	0.31	0.335	1.2	1.3	1.25
12	C-9013	10.65	09.85	10.25	0.31	0.25	0.28	1.6	1.6	1.6
13	C-9015	10.87	10.21	10.54	0.29	0.31	0.30	1.3	1.4	1.35
14	C-9006	10.29	10.76	10.525	0.35	0.31	0.33	1.7	1.3	1.5
15	C-8502-1	09.87	09.56	9.716	0.26	0.32	0.29	1.4	1.6	1.5
16	C-8841	11.65	10.91	11.28	0.21	0.34	0.27	1.8	1.3	1.55
17	C-5623	10.90	09.85	10.375	0.27	0.24	0.25	1.2	1.4	1.3
18	C-7864-1	09.88	09.94	9.91	0.32	0.27	0.29	1.5	1.5	1.5
19	C-8805	11.56	11.23	11.395	0.34	0.28	0.31	1.7	1.4	1.55
20	Azad Kranti	11.68	10.98	11.33	0.37	0.31	0.34	1.4	1.7	1.55
	Mean	**10.698**	**10.451**	**10.57425**	**0.3035**	**0.3035**	**0.3035**	**1.49**	**1.425**	**1.4575**
	S.E. m±	**1.35**	**1.35**	**1.36**	**0.04**	**0.04**	**0.07**	**0.2**	**0.18**	**0.37**
	C.D. (5%)	**3.86**	**3.87**	**3.88**	**0.11**	**0.12**	**0.21**	**0.57**	**0.52**	**1.11**

Conclusion:

The genotype C-9013, KS-453, KS-556 and C-8805 showed themaximum Days to 50% flowering, (40.42), (39.31), (38.86) and(38.37) Days to 50% flowering respectively. The minimum Days to50% flowering was noted in genotype KS-331(31.78). The genotype C-9012, KS-544, KS-224 and C-9015 showed themaximum plant height (82.65 cm), (79.95 cm), (78.10 cm) and (77.75 cm)respectively. The minimum plant height was noted in genotype KS-453 (64.05 cm). The genotype KS-556, C-7864-1, C9006 and C-9011 showed themaximum no. of branches per plant (14.99), (14.50), (14.16) and(13.83) respectively. The minimum no. of branches per plant wasnoted in genotype C-8502-1 (07.50). The ash content ranged from in brinjal genotype C-8805, Azad Kranti, C-8841 and C-9012, 11.95%, 11.33%, 11.28% and 11.17%. Whileminimum ash content was noted in genotype KS-235 (9.715%). The genotype of Azad Kranti showed the maximum fat content (0.37 %) by genotype- C-9006 (0.36 %), KS-555 (0.35 %) and C-9012 (0.34 %). The minimum fat content was noted in genotype of C-5623 (0.23 %). Highest fibre content in various genotype of brinjal KS-456, C-9013, C-8841, and Azad Kranti (1.73 %), (1.63 %), (1.58 %) and (1.57 %). The minimum fibre content was noted in genotype of C-9012(1.29 %).

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