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Evalution of different cultivars of Brinjal (*Solanum melongena* L.) for kharif season under Malwa condition

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Abstract
The present study was undertaken to investigate "Evalution of different cultivars of Brinjal *Solanum melongena* L." for kharif season under Malwa condition" was carried out at the research field, Department of Horticulture, College of Agriculture, Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya, Indore, (M.P.) during Kharif season 2018. In this experiment Evaluated 10 different cultivars of Brinjal (Punjab sadabahar, Annamalai, Arka Abhilamb, Arka nidhi, Hisar shyamla, Green gold, Krishana, Brinjal nano-038, Brinjal No.-209 and Green long) were tested in randomized complete block design with three replications with 3.0 X 1.8 sqm plot size and 60 cm X 45 cm spacing. The result was found that At 20, 40, 60 and 80 days after transplanting, cultivar Hisar Shyamal was observed in significantly maximum plant height, number of branches per plant, leaf area, fruits per plant, fruit yield per plant and fruit yield per hectare followed by Krishna and Arka Nidhi as compared to other cultivars and the minimum time to first flower bud formations, first flowering and first harvesting after transplanting were recorded in Hisar Shyamal cultivar fallowed by Krishna and Arka Nidhi as compare other cultivar.

Keywords: Hisar Shyamal, Krishna, plant height, yield per hectare and brinjal

Introduction
Brinjal (*Solanum melongena* L.) is one of the most important indigenous vegetable crops grown in India and other parts of the world. Brinjal (*Solanum melongena* L.) belongs to the family Solanaceae. It is highly productive and poor man's crop, it is also known as egg plant.
Brinjal is of much importance in the warm areas of far East, being grown extensively in India and other Asian countries like Bangladesh, Pakistan, and Philippines. Other major brinjal producing countries are China, Turkey, Japan, Egypt, Indonesia, Iraq, Italy, Syria and Spain. Brinjal is a herbaceous annual and erect or semi spreading habits. It is a perennial plant but cultivated as annual. It is grown mainly for its tender and immature fruits. They are primarily used as cooked vegetable for the preparation of various dishes in different parts of the world. Brinjal fruits are fairly good source of Ca, P, Fe, and vitamins particularly B group. Brinjal is also valued for its medicinal properties, and has got de-cholestrolizing property primarily due to presence of polyunsaturated fatty acids (linoleic and lenolenic) present in flesh and seeds of fruit in higher amount (65.1%). Presence of magnesium and potassium salt in fruits also impart de-cholestrolizing action.

Material and Methods
The experiments were carried out during Kharif season 2018, at the research field, Department of Horticulture, College of Agriculture, Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya, Indore, (M.P.). Geographically Indore is situated in Malwa plateau region in the Western part of the state of Madhya Pradesh at an altitude of 555.5 meters above mean sea level (MSL). It is located at latitude 22.43^{0}N and longitude of 75.66 ^{0}E. It has subtropical climate having a temperature range of 21 ^{0}C to 45 ^{0}C in summer and 6 ^{0}C to 31 ^{0}C in winter seasons, respectively. The rainfall in the region has been mostly inadequate and erratic in most of the recent past seasons.
Late commencement, early withdrawal of monsoon and occurrence of two to three dry spells during the rainy season are the common features.

The mean annual average rainfall is 964 mm. The soil of experimental field was medium black clay in texture with uniform topography. The treatments consisted of the 10 different cultivars of Brinjal (Punjab sadabahar, Annamalai, Arka Abhilamb, Arka nidhi, Hisar shyamla, Green gold, Krishana, Brinjal nano-038, Brinjal No.-209 and Green long) were tested in randomized complete block design with three replications with 3.0 X 1.8 sqm plot size and 60 cm X 45 cm spacing. Observations were recorded under investigation *i.e.* plant height, number of branches per plant, leaf area, first flower bud formations, first flowering, first harvesting after transplanting, fruits per plant, fruit yield per plant and fruit yield per hectare.

Results and Discussion

Effect of different cultivars of brinjal on phenotypic characters

Among phenotypic characters, plant height, number of branches per plant, leaf area, was studies in brinjal.

At 20, 40, 60 and 80 days after transplanting, the plant height, number of branches and leaf area increased in progressive manner from transplanting to maturity varying from one stage to another in almost all cultivars. The maximum plant height has been shown in Hisar Shyamal cultivar (85.53cm) at different growth stage. Similar result found in case of number of branches and leaf area (24.8), (999.08) respectively. While, minimum plant height, number of branches, leaf area in all growth stages in Green Long cultivar (60.10), (16.20), (4004.42 cm-2) respectively. The growth of the plant is the untiring phenomena through the polar cell division and cell elongation which might be the cause of continuous growth.

This may be due to application of major and minor nutrients, increased the photosynthesis activity, chlorophyll formation, nitrogen metabolism and auxin contents in the plants which ultimately improving the plant height. Similar results have been reported by Sharma and Swaroop (2000) [14], Chaurasia *et al*. (2005) [4], Suneetha and Kathiria (2006) [15], Sao and Mehta (2009) [12], Tripathi *et al*. (2009) [16], Kumar *et al*. (2011) [9], Nirmala *et al*. (2013) [10], and Chaturvedi *et al*. (2016), Responsible for reproducing more or less number of branches. Probable reason for increased number of branches due to the increased rates of photosynthesis and photosynthates supply for maximum branches growth or change in endogenous auxin in turn in apical dominance.

Effect of different cultivars of brinjal on phenological parameters

Earliness parameters like days to first flower bud formation, first flowering and days to first harvesting, all the characters under study were significantly influenced by brinjal cultivars. The minimum time to first flower bud formations, first flowering and first harvesting after transplanting were taken by Hisar Shyamal (34.40 days), (37.60 days), (61.42days) respectively. However, maximum time taken by Green Long cultivar (47.07days), (49.80days), (72.20days) respectively as compare to other cultivars. This may be due to increased supply of major plant nutrients and are required in larger quantities for growth and development of plants. Nitrogen accelerates the development of growth and reproductive phases and protein synthesis, thus promoting yield attributing characters. Similar results have been reported by Kamni and Monpara (2007) [6] and Sao and Mehta (2009) [12] Shahi *et al.* (2002) [12], Suneetha and Kathiria (2006) [15], Kumar *et al* (2008) [15], Chattopadhyay *et al.* (2011) [1], Kumar *et al.* (2011) [9], Kafytullah Indiresh and Santhosha (2011a) [5], and Nirmala *et al.* (2013) [10].

Cultivar Hisar Shyamal has been shown maximum number of flower plant^{-1}. While, minimum number of flower per plant has been shown Green long cultivar. This may be due to increased supply of major plant nutrients and are required in larger quantities for growth and development of plants. Nitrogen accelerates the development of growth and reproductive phases and protein synthesis, thus promoting yield attributing characters. Similar results have been reported by Sao and Mehta (2009) [12], Kumar *et al.* (2011) [9], Kafytullah Indiresh and Santhosha (2011a) [5], Nirmala *et al.* (2013) [10].

Effect of different cultivars of brinjal on yield parameters

All the yield parameters like number of fruit per plant, fruit yield per plant, and fruit yield per hectare under study were significantly influenced by brinjal cultivars. The number of fruit per plant ranged from 12 to 24.40 with a general mean of 16.92. The highest number of fruits per plant were produced by the cultivar Hisar Shyamal (24.40) followed by Krishna (23.67). However, lowest fruit per plant recorded in Green Long cultivar (12). Similar findings were reported by Nirmala *et al*., (2013) [10], Tripathi *et al*. (2009) [16] and Sao and Mehtal. (2009) [12].

Yield per plant of brinjal cultivars under study varied significantly in case of yield per plant. Among the cultivars, highest yield per plant was obtained from Hisar Shyamal (1.22 Kg) and the lowest was given by Green Long (0.75 Kg) and similar result found in case of fruit yield per hectare, in the same cultivar highest fruit yield in Hisar Shyamal (390.40q) and lowest yield in Green Long cultivar (240.96q). Similar findings were also shown by Chaudhary and Pathania (1998) [3], Baswana *et al*. (2002), Kamani and Monpara (2007) [6], Sao and Mehta (2009) [12], Tripathi *et al*. (2009) [16], Sao and Mehta (2010) [12], Chattopadhyay *et al*. (2011) [1], Kumar *et al*. (2011) [9], Kafytullah Indiresh and Santhosha (2011a) [5], Kumar and Arumugam (2013) [7], Nirmala *et al.* (2013) [10] In brinjal, it has been reported that there is a strong association between the number of fruits per plant and yield per plant. So this can be a useful tool for selecting the best variety of brinjal on the basis of number of fruits per plant for effective improvement of this crop.

Table 1: Evalution of different cultivars of Brinjal (*Solanum melongena* L.) for kharif season under Malwa condition

S. No.	Cultivars	Plant height (cm)				Number of branches				Leaf area plant^{-1}(cm^2)			
		20 DAT	40 DAT	60 DAT	80 DAT	20 DAT	40 DAT	60 DAT	80 DAT	20 DAT	40 DAT	60 DAT	80 DAT
1	Punjab Sadabahar	8.00	20.75	32.20	66.40	3.17	6.03	9.8	18.6	260.68	853.22	1822.22	5662.36
2	Annamalai	9.95	24.50	40.30	72.10	3.6	6.2	10.2	21.8	321.21	952.40	2420.95	6286.31
3	Arka Abhilamb	7.25	17.20	26.90	63.20	3	5.07	9.6	17.2	220.95	720.52	1642.56	5969.15
4	Arka Nidhi	13.65	32.60	47.70	81.10	4.2	7.2	11.1	24	468.32	192.42	2542.16	8540.28
5	Hisar Shyamla	14.67	36.58	55.20	85.20	4.7	7.6	11.27	24.8	596.48	1155.27	2631.09	9997.08
6	Green Gold	11.20	27.20	42.20	78.20	3.8	6.6	10.6	22.4	359.32	992.20	2472.15	7242.26
7	Krishna	14.00	34.75	51.07	83.40	4.4	7.4	11.2	24.6	559.93	1122.42	2582.14	8790.22

8	Brinjal Nano-038	12.40	29.60	43.00	78.50	4	6.8	11.13	22.8	389.22	1060.22	2511.55	7746.73
9	Brinjal No.-209	8.50	22.20	34.53	69.60	3.4	6	10	21.4	292.98	872.60	2342.20	5832.20
10	Green Long	5.20	14.20	26.03	60.10	2.8	5.2	8.2	16.2	170.82	630.20	1482.36	4004.42
S.Em ±		0.55	1.23	1.64	3.30	0.25	0.38	0.52	1.12	22.43	32.37	67.57	421.66
CD at 5% Level		1.64	3.64	4.87	9.79	0.74	1.13	1.56	3.33	66.65	96.18	200.78	1252.87

Table 2: Evalution of different cultivars of Brinjal (*Solanum melongena* L.) for kharif season under Malwa condition

S. No.	Cultivars	Days to first flower bud formation	Days to first flowering	Days to first harvest	Number of fruit per plant	Fruit yield per plant (kg)	Fruit yield per ha(q)
1	Punjab Sadabahar	43.60	48.20	72.20	13.20	0.85	271.04
2	Annamalai	39.20	43.00	67.12	15.20	0.95	303.36
3	Arka Abhilamb	46.20	49.20	70.18	12.80	0.79	251.84
4	Arka Nidhi	35.40	38.47	65.32	21.60	1.10	352.00
5	Hisar Shyamla	34.40	37.60	61.42	24.40	1.22	390.40
6	Green Gold	38.40	42.60	62.52	17.40	0.99	315.20
7	Krishna	35.20	38.60	69.22	23.67	1.17	374.40
8	Brinjal Nano-038	37.47	41.00	67.28	15.20	1.03	329.60
9	Brinjal No.-209	40.00	44.60	62.38	13.80	0.89	285.12
10	Green Long	47.07	49.80	68.32	12.00	0.75	240.96
S.Em ±		1.89	1.35	2.29	1.20	0.02	8.99
CD at 5% Level		5.63	4.02	6.81	3.57	0.07	26.71

Conclusion

From the findings of the experiment, it can be concluded that cultivar Hisar Shyamal is the best variety on the basis of the studied phenotypic, phenological, yield attribute, growth analytical and quality parameters suitable for commercial production in Malwa region during kharif season.

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