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Research Note

Evaluation of brinjal (*Solanum melongena* L) germplasm for yield and shoot and fruit borer resistance under drip fertigation

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Abstract
An investigation was conducted at the University orchard, Department of Vegetable crops, Horticultural College and Research Institute, Tamil Nadu Agricultural University, Coimbatore during the year 2010- 2011 to evaluate the germplasm consisted of 182 accessions along with six check varieties *viz.,* Pusa purple Long, Pusa Shyamala, Pusa Kranti, Punjab Sadabahar (received from National Bureau of Plant Genetic Resources, New Delhi) and CO1 and CO2 (released from TNAU, Coimbatore) were taken for evaluation. They were evaluated for their plant, fruit characters along with shoot and fruit borer infestation. The study showed that the accessions *viz.,* IC 354546, IC 112736 and EC 467272 were identified as best performers as they showed favourable characters for earliness to flowering and harvest, number of fruits / plant and yield. Also they recorded lowest level of shoot and fruit borer infestation and high marketable yield.

Key words
Brinjal accessions, shoot and fruit borer infestations, marketable yield

Brinjal (*Solanum melongena* L.) also known as eggplant, belonging to the family Solanaceae is one of the popular vegetable crops grown in India and other parts of the world. Aubergine is its British name. It gained important place in the cuisine due to its availability throughout the season. It originated in its wild form in Indo-Burma region and probably might be a native of India being under cultivation since prehistoric times. It is an important source of fibre (1.3 g/100g), protein (1.4 g/100g), vitamin-A (124 I.U) and potassium (200 mg/100g). In Tamil Nadu, brinjal is raised during summer as well as in rainy season to meet the market demands throughout the year. It is grown in most of the states in India. Evaluation of brinjal cultivars/ accessions is necessary as they will be used to develop superior types or to improve the present cultivars in the breeding programme.

The present experiment was conducted at the University orchard, Department of Vegetable crops, Horticultural College and Research Institute, Tamil Nadu Agricultural University, Coimbatore during the year 2010- 2011. A total number of 182 accessions along with six check varieties *viz.,* Pusa purple Long, Pusa Shyamala, Pusa Kranti, Punjab Sadabahar (received from National Bureau of Plant Genetic Resources, New Delhi) and CO1 and CO2 (released from TNAU, Coimbatore) were taken for evaluation.

Seeds were sown in the nursery and after a month the grown up seedlings were transplanted in the main field. The experiment was laid out in "Augmented Block Design" under drip fertigation. Required cultural operations like watering, manuring and weeding were done periodically. Recommended fertilizer dose was given through drip fertigation. A random of five plants were marked for recording observations in each accession. The observations were recorded for the traits *viz*., plant height, number of branches / plant, plant spread, days to 50% flowering, days to first harvest, single fruit weight, fruit length, fruit girth, number of fruits / plants, yield per plants, shoot borer infestation, fruit borer infestation and marketable yield / plant. The morphological characters like leaf colour, stem colour, fruit colour, fruit shape, fruit size, stripedness, thorniness on the plant as well as on the calyx, calyx colour, glossiness of the fruit were also recorded for documentation.

The results of the present study showed that there was a significant difference with respect to all the characters studied. The recorded observations were statistically analysed and the mean values were tabulated and given in the Table 1.

Among the evaluated accessions the maximum plant height of 143.45 cm was recorded in IC 374928, followed by 126.95 cm in IC261795 and 124.37 cm in IC 112908. The maximum plant height (> 143) also reported by Chowdhury *et al*. (2010), Kalpana Dahatonde *et al.* (2010) and Satesh Kumar *et al*. (2011).

The maximum number of branches per plant (12.55) was recorded in accession IC383195 followed by 12.50 in IC 112736. The next accession which produced maximum of 11.80 branches / plant was EC467272. Same results were also observed by Kamalakkannan *et al.* (2007), Voddoria *et al.* (2007), Kalpana Dahatonde *et al.* (2010) and Satesh Kumar *et al*. (2011).

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The accession IC 354546 was the earliest which took 63.45 days for 50% of flowering and 75.30 days for first harvest. The accession IC 112736 was the second earliest one which took 65.66 days for 50% of flowering and 72.24 days for first harvest and the next accession showed earliness to 50% flowering (68.47 days) and first harvest (76.29days) was EC467272. Earliness for flowering and harvest was also reported in some entries by Paikra *et al.* (2003), Omkar Singh and Kumar (2005), Kamal Deep *et al.* (2006), Suneetha *et al.* (2006), Vaddoria *et al.* (2007), Chowdhury *et al.* (2010) and Kalpana Dahatonde *et al.* (2010).

The highest single fruit weight of 168.77 g was recorded by IC 545934 which was followed by IC 099723 (166.32 g) and IC 249344 (163.60 g). The maximum fruit length of 23.62 cm was recorded in IC383195, followed by the check variety 'Pusa Purple Long' (18.94 cm) and IC 364617 (18.13 cm). These results are in confirmation with Shafeeq *et al.* (2007), Chowdhury *et al.* (2010), Kalpana Dahatonde *et al.* (2010) and Satesh Kumar *et al.* (2011).

The maximum fruit girth was measured by the accession IC433547 (21.93 cm). The next best values for the fruit girth were 21.70 cm (IC 545934). and 21.56 cm (NIC21566) Same trend of results were registered by (Praneetha, 2002), (Thangamani, 2003), Chowdhury *et al.* (2010), Kalpana Dahatonde *et al.* (2010) and Satesh Kumar *et al.* (2011).

The Accession IC 112736 recorded the maximum number of fruits per plant (67.29). The second best Accessions which produced maximum number of fruits was EC 467272 (66.60). This findings were in accordance with (Praneetha, 2002), Chowdhury *et al.* (2010), Kalpana Dahatonde *et al.* (2010) and Satesh Kumar *et al.* (2011). The fruit weight and number of fruits for the best accessions are depicted in the fig.1.

The maximum per plant yield of 4.94 kg/plant recorded in the Acc.10 - IC 354546. The Acc.166 - IC 112736 stood in the second place by recording 4.81 kg/plant and Acc.13 - EC467272 was in third position which recorded the yield of 4.54 kgs/plants. Similar results for yield ranges were registered by Praneetha (2002), Suneetha *et al.* (2006) and Kalpana Dahatonde *et al.* (2010).

The minimum percentage of shoot borer (14.30 %) and fruit borer (13.78) damages were recorded in the Acc.10 - IC 354546. The Acc.166 - IC 112736 was in the second level which recorded 14.46 per cent as shoot borer and 14.13% as fruit borer infestations. The Acc.13 - EC467272 recorded 15.52 per cent and 14.65 per cent as shoot and fruit borer infestation respectively. The lowest shoot and fruit borer infestation was also reported by Praneetha (2002), Kamalakkannan *et al.* (2007) and Kalpana Dehatonde *et al.* (2010), Nirmala (2012). The fruit borer infestation and marketable yield for the best accessions are presented in the fig. 2.

The maximum marketable yield per plant (4.26 kg) was recorded by the Acc.10 - IC 354546 followed by Acc.166 - IC 112736 (4.12 kg). Similar findings were reported by Praneetha (2002), Thangamani (2003) and Prabhu (2004), Nirmala (2012).

The present study revealed that the Acc.10- IC 354546, Acc.166 - IC 112736 and Acc.13- EC467272 were identified as best performers as they showed favourable characters for earliness to flowering and harvest, no. of fruits / plant and yield under drip fertigation. Also they recorded lowest level of shoot and fruit borer infestation and high marketable yield. These accessions can be used in brinjal breeding programme to develop superior types with high yield and low shoot and fruit borer infestation.

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Table 1. Mean performance of the best performing brinjal accessions (2010-11)

ACC NO.	Plant height (cm)	Plant spread (cm)		No. of branches	Days to 50% Flowering	Days to first harvest	Single fruit weight (g)	Fruit length (cm)	Fruit girth (cm)	Number of fruits	Yield per plant (kg)	Shoot borer incidence (%)	Fruit borer incidence (%)	Marketable yield (kg)
		E-W	N-S											
IC354546	69.75	82.65	71.79	10.75	**63.45**	75.30	85.07	7.77	16.27	58.06	**4.94**	**14.30**	**13.78**	**4.26**
IC112736	67.45	83.15	67.05	**12.53**	65.66	76.29	61.43	7.90	16.15	**67.29**	4.81	14.46	14.30	4.12
EC467272	71.12	61.75	56.54	11.80	68.47	76.36	68.11	16.66	14.43	66.60	4.54	15.52	14.65	3.88
IC089914	78.55	59.82	73.65	9.79	69.13	76.97	68.8	14.03	13.42	65.11	4.48	15.98	15.44	3.79
IC344646	82.05	81.85	86.74	10.65	80.59	77.33	83.17	14.74	8.73	52.66	4.38	16.23	18.35	3.58
IC383195	84.38	86.23	83.65	**12.55**	79.51	79.25	76.62	**23.62**	9.82	56.77	4.35	16.97	18.22	3.56
EC144139-D	81.93	45.25	42.86	10.55	70.74	83.83	89.66	11.87	18.63	47.85	4.29	16.05	17.78	3.53
IC099703	112.6	84.87	85.04	8.14	70.66	80.47	68.33	10.47	13.33	59.56	4.30	17.32	18.22	3.52
EC316283	108.15	81.95	85.92	10.92	72.83	86.71	121.17	13.16	17.57	46.34	4.40	16.54	20.45	3.50
IC090785	90.65	70.81	70.75	6.05	71.62	83.62	94.78	8.33	18.57	39.53	4.31	21.22	19.33	3.48
IC090907	65.95	81.61	76.95	8.52	75.83	86.98	104.80	12.42	13.43	41.08	4.30	20.67	20.27	3.43
IC265252	92.25	88.66	82.18	6.92	75.78	86.97	94.43	9.43	12.35	44.84	4.23	18.78	19.15	3.42
IC090781	62.77	60.72	43.35	9.25	70.74	78.62	77.74	12.67	12.11	53.50	4.15	15.67	18.15	3.41
IC090781	98.75	74.83	81.83	10.52	72.65	77.18	96.43	11.37	17.54	43.06	4.15	19.45	18.65	3.38
IC374904	110.12	82.90	75.23	11.05	73.42	78.39	94.12	13.07	12.56	44.58	4.19	19.45	19.34	3.38
IC099723	63.62	64.27	42.64	7.65	73.05	87.14	166.32	12.33	11.83	35.32	4.11	15.55	18.24	3.36
IC466277	58.33	84.45	88.55	11.42	81.27	96.98	116.85	12.91	15.82	35.60	4.16	17.43	19.21	3.36
IC090121	107.64	80.02	80.11	9.95	74.62	88.47	94.73	11.27	16.67	43.46	4.17	17.65	19.72	3.35
IC112908	124.37	82.12	82.83	7.73	72.54	82.16	102.57	10.13	14.37	39.65	4.06	18.45	17.68	3.34
IC411211	87.55	84.46	87.93	11.3	74.58	78.46	93.83	17.27	12.38	44.57	4.11	17.68	18.78	3.34
CD	***7.39***	***5.49***	***7.51***	***1.96***	***5.73***	***5.92***	***10.52***	***2.97***	***1.36***	***7.34***	***0.51***	***0.15***	***1.68***	***0.28***

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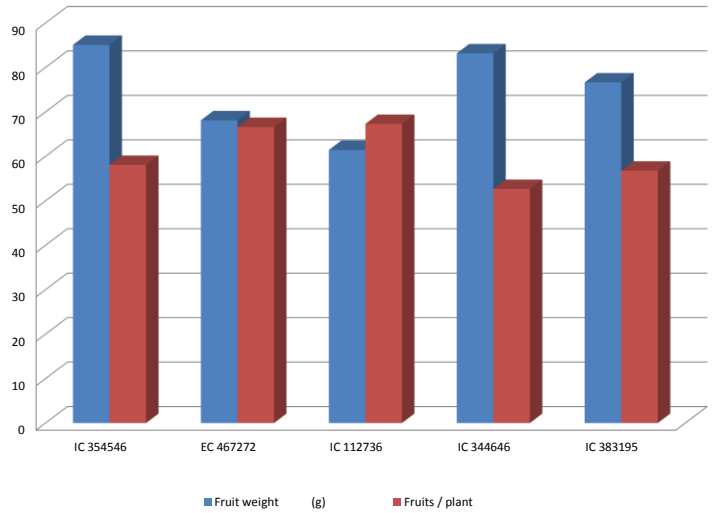

Fig. 1. Fruit weight and number of fruits for the best accessions

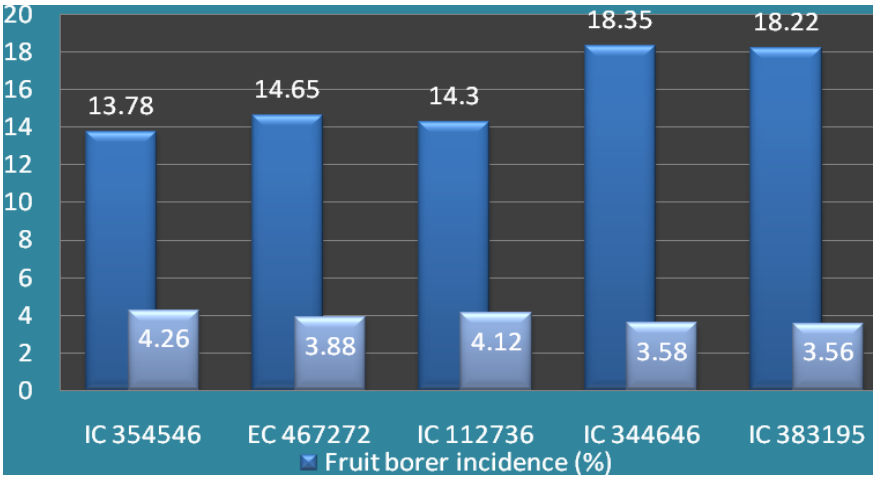

Fig. 2. Fruit borer infestation and marketable yield for the best accessions