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EVALUATION OF BRINJAL GENOTYPES, *SOLANUM MELONGENA* L. IN CAUVERY DELTA REGION OF TAMIL NADU

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ABSTRACT

The research work on "Evaluation of Brinjal, *Solanum melongena* L. in Cauvery delta region of Tamil Nadu" was conducted at Tamil Nadu Rice Research Institute, Tamil Nadu Agricultural University, Aduthurai, Thanjavur district, Tamil Nadu. The experiments were conducted during 2011-13 to evaluate the local brinjal types collected from Thanjavur and Trichy districts of Tamil Nadu. The observations were recorded on growth and yield parameters. Among 25 accessions evaluated, accession SM 12 (9.80 cm) recorded the highest fruit length followed by SM 14 (9.68 cm). The fruit girth ranged from 8.09 to 17.82 cm. Brinjal accession; SM 12 (79.41 g) recorded the highest individual fruit weight followed by SM 22 (78.40 g). The number of fruits/plants was significantly higher in SM 4 (33.57) followed by SM 16 (32.26). The highest yield was recorded in SM 23 (2.22 kg/plant) followed by SM 22 (2.20 kg/plant). The incidence of fruit borer was found to be lower in SM 1 (22.41 %) followed by SM 2 (22.69 %). Among 25 accessions evaluated, SM 23, SM 22 and SM 25 were found to be high yielder than other accessions. Spiny types of brinjal (SM 6, SM 9, SM 12 and SM 16) scored better consumer preference in terms of taste. Grafting of brinjal accessions SM 1 and SM 2 was done successfully on rootstock, Turkey berry, *Solanum torvum* Sw. to reduce the incidence of shoot and fruit borer.
Keywords: Brinjal, Flowering, Yield, Fruit borer, Grafting

Introduction

Brinjal (*Solanum melongena* L.) is most commonly grown vegetable crop in India. It is also known as "Eggplant" and "Aubergine" belongs to the family Solanaceae. The area between India and Indochina is considered to be the centre of diversity (Vavilov, 1951). India is the second largest producer of Brinjal after China with an area of 7.36 lakh hectares and production of 12.78 million tonnes (National Horticulture Board Database, 2019-20). Brinjal holds fourth rank in production, after Potato, Onion and Tomato. Brinjal is a good source of minerals such as phosphorus, iron and vitamins such as Vitamin B complex and medicinal properties. It holds an important place in the tropical diets. The existence of indigenous brinjal is getting eroded slowly due to the drastic shift from use of indigenous seeds to hybrid seeds for getting higher yield. The important qualities like taste, colour, pest and disease resistance are present in the land races, wild relatives and obsolete varieties. The wide variations for plant, flower, fruit, yield, quality characters, pest and disease resistance are revealing enough scope for improvement of yield and quality either through selection or hybridization.

Generally, growth of vegetable crops is greatly inhibited due to poor drainage in the clay soil of Cauvery delta region of Tamil Nadu but brinjal is grown successfully in this region with good yield. Hence, the most valuable germplasm needs to be conserved for creating genetic variability in Brinjal. The losses caused by shoot and fruit borer (*Leucinodes orbonalis* Guenee) vary from season to season (Bhushan *et al*., 2011). Yield loss of brinjal is high due to shoot and fruit borer (Jat and Pareek, 2003; Khan and Singh, 2014). Repeated use of synthetic chemicals results in high pesticide residues in the harvested produce and destruction of beneficial insects (Dadmal *et al*., 2004). Hence, there is a need to search for

alternate and safe method of pest management. Grafting with rootstocks can provide added vigour and resistance to abiotic stress, insect pests and diseases. Grafting reduces pesticides to manage soil borne diseases (Bletsos, 2003). Turkey berry, *Solanum torvum* Sw. is resistant to Verticillium wilt (Alconero *et al*., 1988) and used as rootstock (Ashok kumar *et al*., 2017) for grafting. Keeping these views in mind, study was conducted on the performance of brinjal genotypes and grafting of brinjal on *Solanum torvum* Sw. to reduce the incidence of shoot and fruit borer.

Materials and Methods

The research experiment was conducted at Tamil Nadu Rice Research Institute, Tamil Nadu Agricultural University, Aduthurai, Thanjavur district, Tamil Nadu during 2010-12. Twenty-five brinjal accessions were collected from different districts of Tamil Nadu. The experiment was laid out in a Randomized Block design with three replications. The seeds were sown in January and December and transplanted the seedlings at the spacing of 60 x 60 cm. Standard horticultural practices were followed. The data was recorded on plant height, days for 50% flowering from transplanting, fruit length, fruit girth, fruit weight, number of fruits, fruit yield and fruit borer. The data were subjected to statistical analysis (Panse and Sukhatme, 1985).

Results and Discussion

Results of study revealed that wide variation was recorded in fruit yield and fruit borer incidence. Among 25 brinjal accessions evaluated, SM 18 attained maximum height (105.34 cm) followed by SM 15 (91.32 cm). The dwarfness was recorded in SM 7 (53.70 cm) and SM 9 (53.80 cm). The number of days taken for 50% flowering is significantly lower in SM 1 (56.32) followed by SM 2 (58.67). Brinjal accession, SM 12 (9.80 cm) recorded the highest fruit length followed by SM 14 (9.68 cm), SM 24 (9.61 cm) and SM 1 (9.29 cm). The fruit girth was ranged from 8.09 to 17.82 cm.

With reference to individual fruit weight, SM 12 (79.41 g) recorded the highest followed by SM 22 (78.40 g). The number of fruits/plants was significantly higher in SM 4 (33.57) followed by SM 16 (32.26). The significantly higher yield was recorded in SM 23 (2.22 kg/plant) followed by SM 22 (2.20 kg/plant) and SM 25 (2.01 kg/plant). The variation in the yield of brinjal was recorded by different authors (Thangamani and Jansirani, 2012; Sanas *et al.,* 2014; Reshmika *et al.,* 2016). Fruit length, fruit width (Sidhu *et al*., 1980), number of fruits per plant and fruit weight (Nainar *et al*., 1991) has breeding value.

The incidence of fruit borer was found to be lowest in SM 1 (22.41%) followed by SM 2 (22.69%). Morphological, anatomical, biophysical and biochemical characters are associated with field tolerance of brinjal to fruit borer (Grewal *et al*., 1995; Hazra *et al*., 2004; Gupta and Kauntey, 2008; Naqvi *et al*., 2009). The difference in the incidence of fruit borer may be due to presence of leaf trichomes (Hossain *et al*., 2004) and phenol content (Doshi, 2004). It will be an immense use in breeding of high yielding and fruit borer tolerance varieties through selection and hybridization. Grafting of brinjal accessions SM 1 and SM 2 on *Solanum tarvum* was done successfully to reduce the incidence of shoot and fruit borer.

Table 1 : Plant height, days for 50% flowering, fruit length, fruit girth and fruit weight, number of fruits and fruit yield of Brinjal genotypes grown in Cauvery Delta region of Tamil Nadu

Brinjal Accessions	Plant height (cm)	Days for 50% flowering	Fruit length (cm)	Fruit girth (cm)	Fruit weight (g)	No. of fruits / Plant	Fruit yield / Plant (kg)
SM 1	62.96	56.32	9.29	11.16	36.36	28.97	1.03
SM 2	63.51	58.67	6.24	11.84	45.28	30.32	1.36
SM 3	81.66	67.41	5.98	13.64	48.39	28.45	1.39
SM 4	82.40	69.01	5.88	14.49	42.27	33.57	1.51
SM 5	67.93	72.85	6.15	14.78	51.93	31.44	1.63
SM 6	68.55	71.15	7.67	11.17	41.70	29.62	1.21
SM 7	53.70	68.45	8.43	11.17	44.15	29.32	1.27
SM 8	65.03	75.39	7.09	13.20	51.71	27.96	1.45
SM 9	53.80	73.05	8.65	16.58	71.89	24.75	1.82
SM 10	62.56	69.93	8.66	17.82	71.81	26.11	1.90
SM 11	63.22	71.27	7.71	10.17	39.79	29.79	1.17
SM 12	65.32	65.70	9.80	13.73	79.41	27.89	1.81
SM 13	65.69	63.49	8.72	11.60	48.00	28.03	1.34
SM 14	67.47	59.52	9.68	13.70	58.98	27.32	1.62
SM 15	91.32	66.07	6.23	10.05	35.72	32.17	1.15

SM 16	68.53	69.74	5.86	12.93	54.85	32.26	1.77
SM 17	86.76	71.09	6.79	12.81	52.40	30.90	1.62
SM 18	105.34	68.28	7.52	11.80	51.15	31.83	1.63
SM 19	76.69	67.46	6.99	12.37	51.95	28.73	1.50
SM 20	71.31	72.33	7.44	11.33	43.95	28.58	1.28
SM 21	80.90	65.28	7.69	11.86	56.55	27.06	1.53
SM 22	67.22	63.46	6.76	15.00	78.40	28.06	2.20
SM 23	66.63	69.28	6.24	13.26	72.45	30.59	2.22
SM 24	71.47	61.73	9.61	8.09	32.20	27.75	0.90
SM 25	60.60	72.11	6.07	13.51	64.30	31.10	2.01
Mean	**70.82**	**67.56**	**7.49**	**12.72**	**53.02**	**29.30**	**1.53**
SEd	**1.02**	**0.49**	**1.11**	**1.14**	**0.80**	**1.41**	**0.52**
CD (0.05%)	**2.04**	**0.99**	**1.22**	**2.27**	**1.62**	**2.82**	**0.94**

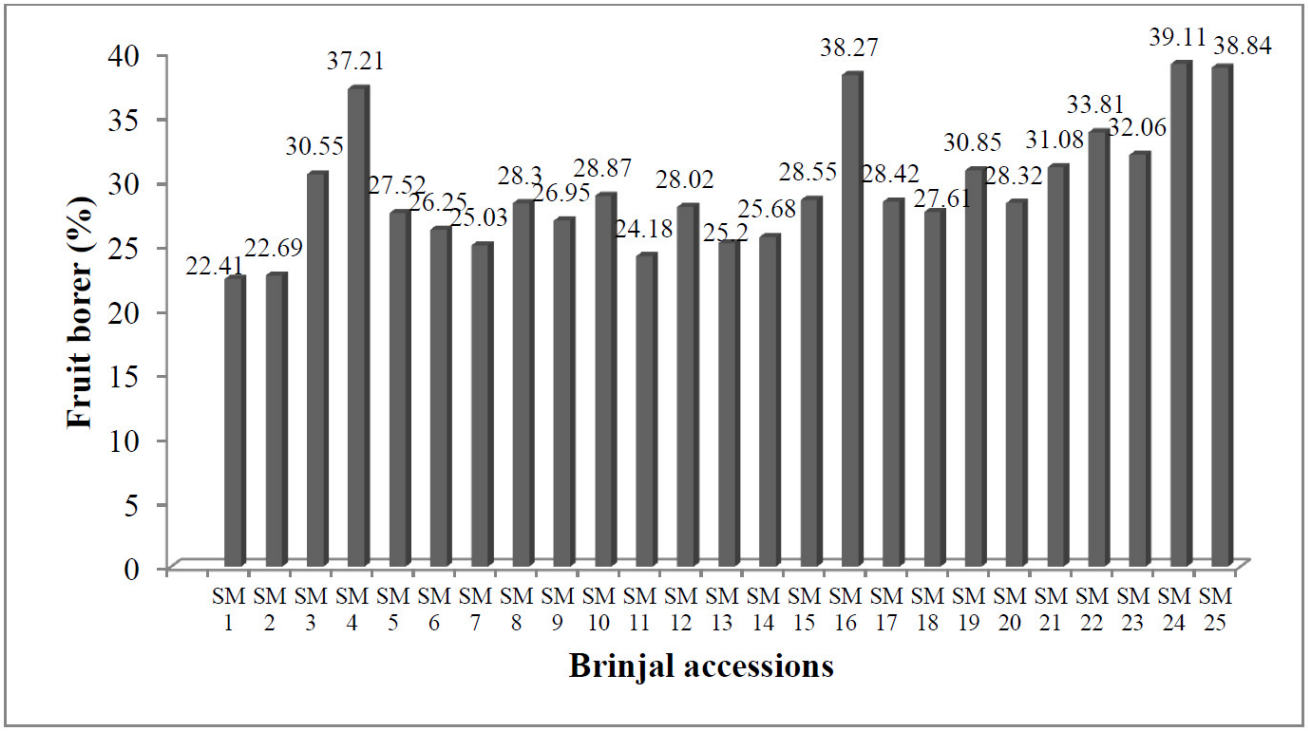

Fig. 1 : Fruit borer incidence of Brinjal genotypes grown in Cauvery Delta region of Tamil Nadu

Conclusion

The brinjal accessions show considerable variation in plant height, fruit length, girth, weight, number of fruits per plant, fruit yield per plant and fruit borer incidence. Among accessions evaluated, SM 23, SM 22 and SM 25 were found to be high yielding genotypes. Spiny types of brinjal (SM 6, SM 9, SM 12 and SM 16) scored better consumer preference in terms of taste. Since preference of brinjal varies from region to region, the best performing brinjal accessions can be exploited in the breeding programmes to develop a new variety either through selection or hybridization. The high yielding accessions with good consumer preference can also be used as scion on rootstock, Turkey berry (*Solanum torvum* Sw.) for producing brinjal grafts. The further study can be extended to different brinjal cultivars with other Solanum species and native brinjal genotypes having flood, drought, pest resistance to enhance the fruit yield and shelf life.

References

Alconero, R., Rabinson, W., Dicklow, B. and Shail, J. (1988) Verticillium resistance in Eggplant, related Solanum species and interspecific hybrids. *Hort Sci*. **23**, 388-390.

Nainar, P., Subbaiah, R. and Irrulappan, I. (1991). Variability, heritability and genetic advance in brinjal (*Solanum melongena* L.). *South Indian Horticulture,* **39**, 32 –36

Ashok Kumar, B., Pandey, A.K., Raja, P., Siddhartha Singh and Wangchu, L. (2017). Grafting in Brinjal (*Solanum melongena* L.) for growth, yield and quality attributes. *Int J Bio resource Stress Manag*. **8**(5), 611-616.

Bletsos, F. (2003). Effect of grafting on growth, yield and Verticillium wilt of eggplant. *J Hortic Sci*. **38**(2), 183-186.

Bhushan, S., Chaurasia, H.K. and Shanker, R. (2011). Efficacy and economics of pest management modules against brinjal shoot and fruit borer (*Leucinodes orbonalis*). *The Bioscan*, **6**, 639-642.

Dadmal, S.M., Nemade, S.B. and Akahre, M.D. (2004). Field screening of brinjal cultivar for resistance to *Leucinodes orbonalis* Guen. *Pest Manag Hort Ecosyst*. **10**, 145-150.

Doshi, K.M. (2004). Influence of biochemical factors on the incidence of shoot and fruit borer infestation in eggplant. *Capsicum and Eggplant Newsletter* **23**, 145-148.

Grewal, R.S., Singh and Dilbagh (1995). Fruit characters of brinjal in relation to infestation by *L. orbonalis* Guen. *Indian J Entomol*. **57**, 336-343.

Gupta, Y.C. and Kauntey, R.P.S. (2008). Studies on fruit characters in relation to infestation of shoot and fruit borer, *Leucinodes orbonalis* Guen. in brinjal *Solanum melongena* Linn. *J Entomol Res*. **32**, 119-123.

Hazra, P.R., Dutta and Maity, T.K. (2004). Morphological and biochemical characters associated with field tolerance of brinjal (*Solanum melongena* L.) to shoot and fruit borer and their implication in breeding for tolerance. *Indian J Genet*. **64**(3), 255-256.

Hossain, M.M., Shahjahan, M. and Saad-UD-Doula Prodhan, A.K.M. (2002). Study of anatomical characters in relation to resistance against brinjal shoot and fruit borer. *Pak J Biol Sci*., **5**(6), 672-678.

Jat, K.L. and Pareek, B.L. (2003). Biophysical and biochemical factors of resistance in brinjal against *Leucinodes orbonalis*. *Indian J Entomol*. **65**, 252-258.

Khan, R. and Singh, Y.V. (2014). Screening for shoot and fruit Borer (*Leucinodes orbonalis* Guenee.) resistance in brinjal (*Solanum melongena* L.) genotypes. *The Ecoscan* **8**, 41-45.

Naqvi, A.R., Pareek, B.L., Nanda, U.S. and Mitharwal, B.S. (2009). Biophysical characters of brinjal plant governing resistance to shoot and fruit borer *Leucinodes orbonalis*. *Indian J Plant Prot*. **37**, 1-6.

Nainar, P., Subbaiah, R. and Irullappan, I. (1991). Variability, heritability and genetic advance in Brinjal (*Solanum melongena* L.). *South Indian Hortic*. **39**, 32-36.

National Horticulture Board (NHB). Indian Horticulture Database. 2020. http,//nhb.gov.in/ area-pro/NHB_Database_2019-20.pdf.

Panse, V.G. and Sukhatme, P.V. (1985). Statistical methods for agricultural workers. ICAR, New Delhi. p. 145-156.

Reshmika, P.K., Gasti, V.D., Shashikanth Evoor, Jayappa, J., Ravindra Mulge and Basavaraj, L.B. (2016). Evaluation of Brinjal (*Solanum melongena* L.) Genotypes for Yield and Quality Characters. *Environ. Ecol*. **34**(2), 531-535.

Sanas, M.P., Sanas, A.P. and Shinde, S.M. (2014). Performance of different types of brinjal for their physical fruit parameters and flowering parameters. *Int J Sci Res*. **3**, 1995-1997.

Sidhu, A.S., Kalloo, G. and Pandita, M.L. (1980). Studies on floral biology in some important vegetable crops, A review. *Haryana J Hortic Sci*., **9**, 207-217.

Thangamani, C. and Jansirani, P. (2012). Correlation and path coefficient analysis studies on yield and attributing characters in brinjal (*Solanum melongena* L.). *Electron J Plant Breed*. **3**, 939-944.

Vavilov, N.I. (1951). The origin, variation, immunity and breeding of cultivated plants. *Chronica Botanica*, **13**, 1-364.