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Studies on morphological characterization of interspecific F1 hybrids of brinjal (*Solanum melongena* L.)

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Abstract
An interspecific hybridization programme in brinjal was undertaken with two brinjal (*S.melongena* L.) cultivars [*viz*., Ruchira and Phule Harit] and one wild species *Solanum insanum*. The morphological characterization of two interspecific F1 hybrids was carried out along with one reciprocal cross (F1). It was important to note that an intermediate plant morphology was noticed in all the F1 hybrids. The dominant wild characters observed in F1 hybrids were spinyness and protruded stigma where spinyness was the prime important character to offer resistance against little leaf disease.

Keywords: Hybrid, morphological characters, brinjal

Introduction
Brinjal (*Solanum melongena* L.) is an important commercial vegetable crop grown throughout the year in all parts of India except on high altitudes. It is highly productive and usually find its place in the diet of common man. It faces manifold problems in cultivation and production, but the little leaf is one of the most serious disease. The chemical and mechanical control measures are useful to reduce the little leaf diseases up to some extent but it is hardly impossible to control this severe disease completely. The use of wild species in hybridization programme needs to be evaluated for improvement of horticultural traits. In this regard, quantitative characters are important for improvement of yield potential, while qualitative characters are pre requisite for consumer preference as a very wide variability for consumer acceptance is noticed in brinjal.

Materials and Methods
The present investigation was carried out at Department of Horticulture, Mahatma phule Krishi Vidyapeeth, Rahuri, Maharashtra (India) during 2000-2002. Experimental material consisted wild species of brinjal *solanum insanum* and two cultivated genotype *viz*- Ruchira and Phule Harit. The wild species was brought from IARI, New Delhi.
In order to make the crosses, one wild and two cultivated parents were used reciprocally. The buds open in next morning were selected for emasculation. Anthers were removed with the help of forceps and the buds was covered immediately with butter paper bag or cotton plug to avoid contamination of foreign pollen. The pollination was done by collection of pollen grains from the male parent and pollens were applied with fine camel brush. The pollinated flowers were covered with butter paper bag. The crossed fruits were harvested at maturity and seeds were separated. Hundred crosses were made in each cross combination. Two interspecific F1 hybrids with their reciprocals were raised, 10 plants of each F1 hybrids were transplanted for morphological characterization.

Results and Discussion
In the present investigation, it is found that maximum plant height was recorded in F1 hybrid, *S.insanum* x Phule Harit 95 + 8.5 cm followed by *S. insanum* x Ruchira 85 + 6.0cm. Thus, during brinjal interspecific hybridization hybrid vigour was observed for plant growth. Similar observations are recorded by Kirti and Rao (1982) [4] who observed vigorous interspefic F1 hybrids in brinjal.
In the fruit vegetable like brinjal, the number of fruits per plant is important character responsible for increasing the yield level, under present investigation the F1 hybrids, *S. insanum* x Ruchira, and *S. insanum* x Phule Harit and Ruchira x .*insanum* recorded fruits

with range of 22-26, 18-20 and 16-18 per plant respectively. In reciprocal interspectific cross of phule harit x *S. insanum* post zygotic sterility (i.e.no seed germination) was obseverd.

The highest fruit weight (45-50 g) were recorded by F1 hybrids, *S. insanum* x Phule Harit and Ruchira x *S. insanum* followed by F1 hybrid *S. insanum* x Ruchira (35-40g). Vishwanathan (1975) [5] observed larger fruit size, like cultivated brinjal during interspectific hybridization in brinjal at F2 generation. Thus, these hybrids can effectively be exploited in further crop improvement programme.

In the hybrids, *S. insanum* x Ruchira, and Ruchira x *S.insanum*, the colour of immature fruit were purple with white stripes, while in the hybrids *S.insanum* x Phule Harit, the fruits were green with white stripes was observed. Fruits of *S.insanum* x Phle Harit were simiar to cv. Phule Harit, therefore fruits of this hybrid may be accepted by consumer. However, fruits of *S.insanum* x Ruchira and its reciprocal hybrid had oblong fruit shape, distinct white colour with faint purple strips. Vishwanathan (1975) [5] recorded the purple fruit colour in the interspecific hybrid between *S. incanuam* x *S. melongena*.

Cultivated brinjal cultivars used in breeding programme were non- spiny while *S. insanum* a wild species was spiny. However, F1 hybrids showed spinyness. Thus, spinyness is dominant wild character expressed in F1 hybrids.

Khapre *et al.* (1985) [3], Bletsos *et al.* (1998) [1] and Patel (2001) [5] also reported that spinyness is dominant character in brinjal interspecific hybridization. The dominant wild characters observed in F1 hybrids were spinyness and protruded stigma, where spinyness was the prime important chareter to offer resistance against little leaf disease. This was confirmed by Rao and Kumar (1980) [2] where they found *S.indicum* is tall, erect and spiny, it was resistant to fruit rot, little leaf, leaf mosaic virus and brinjal fruit borer in the field condition.

Table 1: Morphological characterization of interspecific F1 hybrids and their parents.

Sr. No.	Characters	P1 *S.insanum*	P2 Ruchira	F1
1.	Plant growth habit	Semi- indeterminate, Semi-erect	Semi- indeterminate, Semi- erect	Semi- indeterminate, erect.
2.	Plant height (cm)	70 + 3.5	75+ 5.0	85+ 6.0
3.	Stem thickness (cm)	1.5+0.2 Medium	2.2 + 0.3 Thick	1.6 + 0.3 Medium
4.	Spine location	Stem, leaf, calyx, petiole	----	Stem, leaf, calyx, petiole
5.	Leaf lamina (cm) Length x Breadth	Medium 14.0+0.4 10.0+0.2	Broad 16.5+0.4 13.0+0.3	Medium 15.0+0.5 12.0+0.3
6.	Leaf serration	Shallow	shallow	Shallow
7.	Leaf colour	Light green	Light green	Light green
8.	Inflorescence	Solitary	Clustered	Solitary
9.	No.of flowers per inflorescence	1	3-4	1
10.	Petal arrangement	United	United	United
11.	Stigma position	Protruded	Enclosed	Protruded
12.	Fruit setting	Self compatible	Self compatible	Self compatible
13.	Fruit shape	Oval	Round	Oval round
14.	Fruit size	Medium	Big	Medium
15.	Fruit weight (gm)	26-28	130-140	35-40
16.	Number of fruits per plant	20-25	30-35	22-26
17.	Yield potential (kg/plant)	0.52-0.70	3.9-4.9	0.77-1.4
18.	Fruit colour			
	a. Immature	White	Purple	Purple white
	b. Mature	Yellow	Yellow	Yellow
19.	Seed size	Medium	Bold	Medium

Table 2.

Sr. No.	Characters	P1 *S.insanum*	P2 JB – 16 (Phule Harit)	F1
1.	Plant growth habit	Semi- indeterminate, Semi-erect	Semi- indeterminate, Erect	Semi- indeterminate, erect.
2.	Plant height (cm)	70 ± 3.5	110± 10.0	95± 8.5
3.	Stem thickness (cm)	1.5±0.2 Medium	2.5 ± 0.3 Thick	1.5 ± 0.2 Medium
4.	Spine location	Stem, leaf, calyx, petiole	---	Stem, leaf, calyx, petiole
5.	Leaf lamina (cm) Length x Breadth	Medium	Broad	Medium
		14.0±0.4	19.0±0.5	12.4±0.3
		10.0±0.2	15.0±0.4	11.0±0.2
6.	Leaf serration	Shallow	Shallow	Shallow
7.	Leaf colour	Light green	Dark green	Light green
8.	Inflorescence	Solitary	Solitary	Solitary
9.	No.of flowers per inflorescence	1	1	1
10.	Petal arrangement	United	United	United
11.	Stigma position	Protruded	Enclosed	Protruded
12.	Fruit setting	Self compatible	Self compatible	Self compatible
13.	Fruit shape	Oval	Oval	Elongated oval
14.	Fruit size	Medium	Big	Medium
15.	Fruit weight (gm)	26-28	270-280	45-50

16.	Number of fruits per plant	20-25	12-14	18-20
17.	Yield potential (kg/plant)	0.52-0.70	3.24-3.92	0.80-1.00
18.	Fruit colour			
	a. Immature	White	Green with white stripes	Greenish white
	b. Mature	Yellow	Yellow	Yellow
19.	Seed size	Medium	Bold	Medium

Table 3.

Sr. No.	Characters	P1 Ruchira	P2 *S.insanum*	F1
1.	Plant growth habit	Semi- indeterminate, Semi-errect	Semi- indeterminate, Errect	Semi- indeterminate, errect.
2.	Plant height (cm)	75 + 5.0	70+ 3.5	82+ 4.0
3.	Stem thickness (cm)	2.2+0.3 Thick	1.5 + 0.2 Medium	1.5 + 0.3 Medium
4.	Spine location	---	Stem, leaf, calyx, petiole	Stem, leaf, calyx, petiole
5.	Leaf lamina (cm) Length x Breadth	Broad	Medium	Medium
		16.5+0.4	14.0+0.4	10.0+0.2
		13.0+0.3	10.0+0.2	8.0+0.2
6.	Leaf serration	Shallow	Shallow	Shallow
7.	Leaf colour	Light green	Light green	Light green
8.	Inflorescence	Clustered	Solitary	Solitary
9.	No.of flowers per inflorescence	3-4	1	1
10.	Petal arrangement	United	United	United
11.	Stigma position	Enclosed	Protruded	Protruded
12.	Fruit setting	Self compatible	Self compatible	Self compatible
13.	Fruit shape	Round	Oval	Oval round
14.	Fruit size	Big	Medium	Medium
15.	Fruit weight (gm)	130-140	26-28	45-50
16.	Number of fruits per plant	30-35	20-25	16-18
17.	Yield potential (kg/plant)	3.9-4.9	0.52-0.70	0.72-0.90
18.	Fruit colour			
	a. Immature	Purple	White	Purple white
	b. Mature	Yellow	Yellow	Yellow
19.	Seed size	Bold	Medium	Medium

References

1. Bletsos FA, Roupakias DG, Thanassoulopolos CC, Rubatzky VE. Morphological traits of the interspecific eggplant hybrid *Solanum melongena* x *Solonum torvum*. Third international symposium on diversification of vegetable crops, Beijing, China 1998, 24-27.
2. Rao GR, Anil Kumar. Proc. Indian Acad. Sci. (Plant Sci.) 1980;89(2);117-121.
3. Khapre PR, Wanjari KB, Deokar AB. Genetic studies in *Solanum melongena L. X Solanum indicum* L., P.D.K.V. Res. J 1985;9(1):13-18.
4. Kirti PB, BGS Rao. Cytological studies on F1 hybrids of *Solanum integrifolium* with *Solanum melongenaar* insanum. Genetica, Netherlands 1982;59;127-131.
5. Patel DA, Shukla PT, Jadeja GC. Morphological sturies on interspedific hybrids between *solanum indicum* L. and *Solanum Melongena* L. Ind. J. Genet. & PlBreed 2001;61(2):180-182.
6. Vishwanathan TV. On the occurrence of natural hybridization between *Solanum incanum* L. and Solanum melongena L. Curr. Sci 1975;44(4):134.