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STUDIES OF THE INTERVARIETAL HYBRIDS OF *SOLANUM MELONGENA*, L*

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Miwa *et al* (1958), Krishnappa and Chenna Veeriah (1964) attempted certain intergeneric crosses of the cultivars of *Solarium melongena,* L. Swaminathan (1949), Argikar (1952) Rai (1959) reported many intraspecific crosses mostly in connection with the studies of heterosis in egg plant. Ramirez (1959) and Suzuki *et al* (1964), suggested the possibility of evolving disease resistant varieties through hybridization. Gopimony (1968) reported that the F, of *Solatium melongena,* L. cultivars and *Solarium melongena,* var. *insanum* exhibited heterotic effects in almost all morphological features. He also reported wilt resistance in the F_1 plants. The present investigations were taken up to ascertain the inheritance of wilt resistance and higher protein content of the wild variety, *insanum* with a view to incorporating these desirable characters into the cultivars.

Materials and methods

The materials consisted of the cultivated variety purple long Dutta and the wild variety insanum of *Solanum melongena* and the F_2 generation of the cross between these two varieties. Two crops each consisting of the F_2 plants and their parents were raised one for studying the inheritance of wilt resistance and the other for studying the morphological characters, protein content etc. For wilt resistance plants were grown in pots. Chi-square test was applied to find the goodness of fit for the segregation ofqualitative characters.

Results and discussion

The range of variation, the co-efficient of variation, the parental means and the F_2 means in respect of plant height, spread, number of branches, number of fruits, length of fruits and protein content are furnished in Table 1.

The range of variation of the F_2 progeny is greater and the variability is more in the F_2 as indicated by the co-efficient of variation. The F_2 mean is closer to the parental means, except in the case of the length of the fruit. In most cases the parental types are recovered among the F_2. The variation within the parental limits is continuous.

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Table I. Comparative study of parents and F_2 generation

Characters	Range of variation			Co-efficient of Variation			Parental means	means
	Insa-num	Culti-var	F_2	Insa-num	Culti-var	F_2		
Plant height (cm)	25-35	95-135	34-135	5,46	7.90	19 29	77.25	88.14
Spread (cm)	105-210	60-105	75- 210	10.51	8.90	15.83	121.81	119.80
No. of branches	65-95	25-45	15-115	8.36	1.02	28.50	56.75	54.94
No. of fruits	30-70	10-15	1-90	15.02	19 39	28 52	43.25	44. CO
Length of fruit (cm)	2 5-4.5	21.5-32.5	3.5-13.5	13.00	11.90	26.30	14.75	7.20
Protein content (%)	2.5-2.9	1.6-1.9	1.7-2.6	4 09	4.65	8.86	2 35	2.21

The distribution also indicates that the intermediate types are represented "more frequently than the extreme types. The pattern of distribution variability **and** reappearance of the parental types in the F, generation suggest that these characters are polygenic control **and** are inherited in a quantitative manner. This is in agreement with the findings of Rao (1966) bat no inhibitory action is noticed on plant height as suggested by him. The non-appearance of the parental types in certain cases can be explained as due to lack of sufficient number of plants studied compared to the large number of polygenes controlling the characters.

With respect to fruit length, the F„ mean is much less than the parental mean and none of the segregants recorded the fruit length of the cultivar. The F_2 distribution shows skewness towards the small fruit length of the *insanum* parent; Rao (1966) recorded similar results and explained this as the action of inhibitory genes carried by the wild parent on the polygenes controlling the character. The inhibitory genes appear to act cumulatively on fruit length. The present results agree with this finding.

Table 2 presents the segregation in respect of the character, spininess. Hagiwara and Lida (1930), Khan and Ramzan (1955) and Rao (1966) reported that spininess in egg plants was dominant over non-spiny nature and was mono-genically inherited which is in agreement with the present finding.

Approximately 75% of the F_2 population exhibited resistance to wilt. The F_1 also showed resistance (Gopimony 1968) inspite of artificial epiphytotics, suggesting genetic resistance. The present investigation

Table 2. Segregation of charactors of parents and F_2 progeny

Character	Phenotype	Observed frequency (O)	Expected frequency (E 3:1)	D:	O.E. x^2
1. Spininess	Spined	182	189.7	7.7	0.3
	Spineless	71	63.3	7.2	0.9
Total		253	253		
2. Resistance to wilt	Resistant	111	112.5		0.2
	Susceptible	39	37.5		0.06
Total		150	150		0.08*

*Not significant at P: 0.05

reveals the monogenic basis of this character as opposed to the views of Suzuki *et al* (1964) and in agreement with the findings of Sinchair and Walker (1955). The possibility of improvement of the cultivar by incorporating the gene for resistance to wilt is suggested.

Summary and conclusion

Studies in the F_2 generation of the cross between *Solanum melongena*, L. var. *Pusa ftutta* and var. *insanum* were carried out to find out the mode of inheritance of characters with special reference to wilt resistance and higher protein content exhibited by the wild parent. Plant height, spread of the plant, number of branches, number of fruits, length of fruit and protein content were found to be under polygenic control. The spininess nature and resistance to wilt were found to be monogenically inherited; the spined nature and resistance being dominant over spineless nature and susceptibility respectively. This finding is of considerable value in breeding programmes of *Solarium melongena*, L.

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