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Biochemical Basis of Field Resistance for Shoot and Fruit Borer in Brinjal

ıoshi, M. K. Bhalala* and K. B. Kathiria

ıable Research Station, Gujarat Agricutural ıiversity, Anand Campus, Anand - 388 110

The shoot and fruit borer (*Leucinodes bonalis* Guen.) is the most serious pest of rinjal (*Solanum melongena* L.) in India. As nuch as 70 per cent of the fruits have been eported to the damaged by larvae of this nsect (Krishnaiah *et al.*, 1976). With the continuous use of insecticides for its control, it is feared that this insect may become resistant towards insecticides. Further more, the present control measurement are not fully effective and are also costly and hazardous. Hence, resistant varieties against this pest are urgently needed. Resistant may be due to either physical, biochemical or both combined factors. Therefore, in the present study efforts were made to determine the biochemical basis of resistance in brinjal against shoot and fruit borer.

An experiment comprised of 41 diverse genotypes was conducted at Vegetable Research Station, Gujarat Agricultural University, Anand during 1995-96 using randomised block design with 4 replications. There was natural insects and disease infestation in the field as no spraying was made to control it. Standard procedures were followed to determine the biochemical constituents.

Characters association and direct as well as indirect effects of these traits on shoot and fruit borer infestation were studied. This will provide precise information for the selection of important biochemical traits which may contribute more towards resistance to shoot and fruit borer. The data presented in Table 1 indicated that genotypic correlation of shoot and fruit borer infestation with total phenols, polyphenoloxidase activity and glycoalkloid content were negative and significant. However, this trait had positive and significant genotypic association with total soluble sugars, anthocyanin content and reducing sugars. The results are in agreement with the findings of Singh *et al.* (1982) and Bajaj *et al.* (1989).

The estimates of direct and indirect effects of biochemical traits on shoot and fruit borer infestation revealed that the total soluble sugars, reducing sugars and anthocyanin content had high positive and direct effect except anthocyanin content which have high indirect effect via total soluble sugars. This type of trend was also observed in reducing sugars which resulted into positive significant association of these traits with shoot and fruit borer infestation. On the other hand, total phenols, polyphenoloxidase activity and

*Present address : Research Scientist (Veg.), Vegetable Research Station, GAU, Anand-388 110.

TABLE 1

Path coefficient analysis sharing direct (underlined) and indirect effects of seven biochemical traits on shoot and fruit borer infestation in brinjal.

Characters	*Dry matter (%)*	*Total phenols (mg/100 wt.)*	*Total soluble (mg/100 mg dry wt.)*	*Reducing sugars (mg/100 mg dry wt.)*	*Anthocyanin content (mg/100 g)*	*Polyphen-oloxidase activity (ΔO.D./min.)*	*Glycoalkloid content (O.D.)*	*Genotypic correlation with shoot and fruit borer infestation*
Dry matter	**-0.0723**	0.0829	-0.1450	-0.0525	-0.0011	-0.0041	-0.0199	-0.2102
Total phenols	0.0142	**-0.4217**	0.2093	0.1038	-0.0022	-0.0005	-0.0269	-0.4239**
Total soluble sugars	0.0144	-0.1209	**0.7298**	00.976	0.0077	-0.0214	0.0277	0.7348**
Reducing sugars	0.0216	-0.2492	0.4056	**0.1757**	-0.0024	-0.0116	-0.0195	0.3202*
Anthocyanin content	0.0042	0.0495	0.2977	-0.0226	**0.0188**	-0.0315	0.0265	0.3426*
Polyphenoloxidase activity	-0.0026	-0.0018	0.1362	0.0177	0.0052	**-0.2442**	0.084	-0.3483*
Glycoalkloid content	-0.0101	-0.0799	-0.1427	0.0241	-0.0035	0.0068	**-0.1418**	-0.3472*

*, ** significant at 5% and 1% levels of significance, respectively.

glycoalkloid content had a high negative direct effect on shoot and fruit borer infestation.

It is suggested that the genotypes having high phenols, glycoalkloid and polyphenoloxidase activity and lower in total soluble sugar, reducing sugars and anthocyanin content could be utilized in the breeding programme for the development of shoot and fruit borer pest resistance varieties in brinjal crop.

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