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Heterosis and combining ability studies for shoot and fruit borer infestation (*Earias spp.*) in okra (*Abelmoschus esculentus* L. Moench)

SANJEEV KUMAR AND N.K. THANIA

See end of article for authors' affiliations

Correspondence to :
Sanjeev Kumar
Department of Vegetable Science & Floriculture, CSK HPKV, PALAMPUR (H.P.) INDIA

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ABSTRACT

The experiment material of 30 hybrids and 13 parents was used for screening and gene action studies. EC-329424 X Varsha Uphar, EC-329424 X P-8, EC-329424 X Arka Abhay, EC-169513 X P-8, EC-169513 X Varsha Uphar and EC-169513 X Arka Abhay have been identified as potential F_1's showing high resistance to the pest. Lines, EC-329424, EC-169513, EC-7194 and IC-128061 and the tester, Varsha Uphar were good general combiners for this trait. No cross-combination could reveal significant sca effect for this trait. Thus, parents with good gca effects may be involved in multiple crosses to obtain desirable segregants. The gca variances as well as s^2A were higher than sca variances and s^2D indicating the preponderance of additive gene action and hence, selection could be exploited for the improvement of this trait.

Key words: Okra, *Earias spp.* heterosis and Gene action.

Okra (*Abelmoschus esculentus* (L.) Moench) also known as lady's finger, *bhindi* or gumbo is one of the common and principal vegetable crops. In India, area under okra cultivation is about 391.2 thousand hectares with an annual production of 4338.7 thousand tonnes. In okra, a number of varieties have been developed/ identified which possess resistance to Yellow Vein Mosaic Virus (YVMV). Little attention has been given to breed/ identify varieties/genotypes resistant to shoot and fruit borer, which is one of the serious insect- pests and causes 41.60 per cent losses in different parts of India (Krishnakumar and Srinivasan, 1987, Jalgaonkar et al., 2002 and Pandey et al., 2002). However, according to Hiremath (1984), *Earias species* infestation may reach as high as 60.68 per cent. Further, control strategies for this pest are exclusively based on the chemicals that are harmful in view of frequent harvesting of fruits (2-3 times a week). The injudicious use of pesticides for controlling the pest also poses serious health problems by polluting the environment. Screening/development of resistant/ tolerant varieties/hybrids against the pest appears to be eco-friendly and the safest viable alternative. Therefore, the present investigation was carried out, taking into consideration the importance of pest.

MATERIALS AND METHODS

The experiment material comprised of F_1 population of 30 crosses developed by crossing ten diverse genotypes of okra viz., IC-117236, IC-128061, IC-128099, EC-169476, EC-169513, EC-305644, EC-329356, EC-329424 and EC-7194 as female parents and horticulturally superior and genetically diverse parents namely Varsha Uphar, Arka Abhay and P-8 in line x tester model (Kempthorne, 1957). Thirty F_1 hybrids along with 13 parents were grown in randomized block design with three replications. Each cross/ parent was raised in a single row of 3m with inter and intra-row spacing of 45 cm and 15 cm, respectively. Unfortunately, pest did not appear during vegetative growth of crop. Therefore, data on fruit damage was recorded by counting total number of fruits on randomly taken plants and per cent fruit damage was calculated by counting such fruits. The observations were recorded till last harvesting. In the present study, genotypes are grouped into different categories on the basis of incidence of fruit borer as per scale given by Raut and Sonone (1979).

RESULTS AND DISCUSSION

In the present study, the crosses, EC-329424 x Varsha Uphar, EC-329424 x P-8, EC-329424 x Arka

Table 1 : Fruit borer incidence in okra genotypes and their hybrids

Genotypes	Fruit Infestation (%)
IC-117236	24.49 (29.64)
IC-128061	9.37 (17.76)
IC-128099	28.54 (32.26)
EC-169476	28.17 (32.02)
EC-169513	8.27 (16.65)
EC-305644	26.46 (30.90)
EC-329356	23.45 (28.93)
EC-329424	9.70 (18.13)
EC-7194	15.86 (23.37)
LB Local	26.57 (30.94)
IC-117236 x Arka Abhay	23.65 (29.06)