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# Screening of some okra varieties against *Earias vittella* under Allahabad field conditions

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**Abstract**
Screening experiment was conducted at Central Agricultural field, SHUATS, Allahabad, during *kharif* 2016 to identify the infestation of okra shoot and fruit borer, *Earias vittella* (Fab.). Eight okra varieties were screened to know their response on the basis of shoot and fruit damage scale. Based on the infestation of the shoot and fruits (number and weight basis) the grading is done as resistant, moderately resistant, moderately susceptible, susceptible sources. Among the eight genotypes, IC-117076 (5.98%, 8.54%, and 7.03%) and HRB-9-2 (6.78%, 7.01% and 5.78%) were moderately resistant to shoot and fruit damage (number and weight basis) and IC-033854 (16.43%, 25.39% and 21.22%) was found moderately susceptible to shoot and fruit damage (number and weight basis). VRO-4 (18.12%, 39.16% and 32.25%), VRO-3 (16.18% 37.76% and 31.09%) and VR0-22 (17.02%, 38.44% and 31.65%) were found moderately susceptible and susceptible to shoot and fruit damage (number and weight basis), respectively. PUSA SAWANI (31.20%, 39.30% and 32.42%) and IC-45831 (30.01%, 36.98% and 30.45%) found susceptible to shoot and fruit damage (number and weight basis).

**Keywords:** *Earias vittella*, genotype, screening, okra, resistance, screening

## Introduction
Okra (*Abelmoschus esculentus* L.) commonly known as bhendi or lady's finger belongs to the Malvaceae family and is an important vegetable crop grown across different states of the country throughout the year. It is known by many local names in different parts of the world. It is predominantly grown in tropics and subtropics. In Asia, India ranks first in the production of okra. In India, Andhra Pradesh is the leading okra producing state. The main cause of low yield in okra is phytophagous insect pests, diseases and mites but the spotted bollworms (*i.e.*, *Earias vittella* and *Earias insulana*) are the most serious insect pests of okra. It alone is reported to cause 57.1 Percent fruit infestation and 54.04 Percent net yield loss in okra. According to an estimate this pest can cause 36-90% loss in fruit yield of okra. Considering the limitations in the chemical control [method, the alternative method of mechanism of resistance is preferred. For this the evaluation of genotypes becomes necessary for identifying the resistant source for further studies.

## Materials and Methods
The experiment was conducted at Central agricultural field, SHUATS, Allahabad, during *kharif* 2016, to screen the okra genotypes i.e., IC-033854, IC-117076, VRO-4, PUSA SAWANI, HRB-9-2, VRO-22, IC-45831, VRO-3 under field condition. For this, eight genotypes were chosen for screening in three replications. Experiments were laid out in a Randomized Block Design (RBD) with three replications. The row to row distance was kept as 45 cm and plant to plant as 30 cm. The plot size was 2 m × 2 m. All the recommended cultural practices were followed to raise the crop and no plant protection measures were followed.

### Field screening of okra genotypes
### Shoot damage
The number of healthy and bored shoots from the five randomly selected tagged plants was recorded separately and cumulative mean Percent damaged shoots on number basis was calculated. The Percent shoot damage was calculated by adopting the following formula (Narayanan *et al*. 2016) [7].

$$\text{Percent shoot infestation} = \frac{\text{Number of damaged shoots}}{\text{Total number of shoots}} \text{ X } 100$$

**Fruit damage (on number basis)**
The number of healthy and bored fruits from the five randomly selected tagged plants was recorded separately for each germplasm line at every picking and the cumulative mean Percent damaged fruits based on number and weight basis was calculated.The Percent fruit damage was calculated by adopting the following formula (Narayanan *et al*. 2016) [7].

$$\text{Percent shoot infestation} = \frac{\text{Number of damaged shoots}}{\text{Total number of shoots}} \times 100$$

**Fruit damage (on weight basis)**
The Percent fruit damage (On weight basis) was calculated by adopting the following formula (Chakraborty *et al*. 2015) [2].

$$\text{Percent fruit damage (On weight basis)} = \frac{\text{Weight of the damaged fruits}}{\text{Weight of the total fruits}} \times 100$$

The varieties were classified into different grades by Gupta and Yadav (1978). Grade 1 = Immune (No damage), 2 = resistant (1-5% infestation), 3 = moderately Resistant (>5-15% infestation), 4= moderately susceptible (>15-30% infestation), 5= susceptible (more than 30% infestation).

**Results and Discussion**
The incidence of okra shoot and fruit borer *Earias vittella* was studied in *kharif* 2016, and presented in the table 1 and fig.1.

**Table 1:** Level of Incidence of Okra Shoot and Fruit Borer

| S. No. | Variety | Shoot damage | | Fruit damage (number basis) | | Fruit damage (weight basis) | |
|---|---|---|---|---|---|---|---|
| | | Mean % | Grade | Mean % | Grade | Mean % | Grade |
| 1 | IC-033854 | 16.43 | MS | 25.39 | MS | 21.22 | MS |
| 2 | IC-117076 | 05.98 | MR | 08.54 | MR | 07.03 | MR |
| 3 | VRO-4 | 18.12 | MS | 39.16 | S | 32.25 | S |
| 4 | PUSA SAWANI | 31.20 | S | 39.30 | S | 32.42 | S |
| 5 | HRB-9-2 | 06.78 | MR | 07.01 | MR | 05.78 | MR |
| 6 | KASHI KRANTHI (VRO-22) | 17.02 | MS | 38.44 | S | 31.65 | S |
| 7 | IC-45831 | 30.01 | S | 36.98 | S | 30.45 | S |
| 8 | VRO-3 | 16.18 | MS | 37.76 | S | 31.09 | S |
| F-test | | S | | S | | S | |
| S Em ± | | 0.40 | | 1.42 | | 1.21 | |
| C D 5% | | 1.22 | | 4.30 | | 3.66 | |

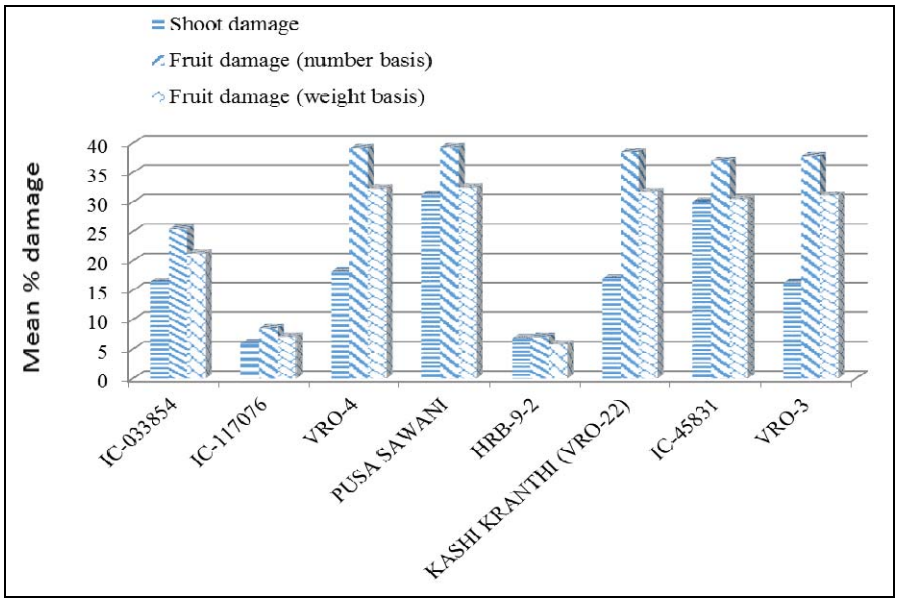


**Fig 1:** Screening of selected okra genotypes against shoot and fruit borer, *Earias vittella*.

**Percent shoot infestation during *kharif* 2016**
Minimum mean percent shoot infestation was recorded from variety IC-117076 (5.98 %) followed by HRB-9-2 (6.77%) statistically which was *on par* with each other. Gautam *et al.* (2014) [3] reported lowest percentage of shoot infestation by *Earias* spp in HRB-9-2 found as moderately resistant. The accession VRO-3 (16.18%) and VRO-22 (17.02%), was showed the moderately susceptible to shoot damage as in the studies done by Gautam *et al*. (2014) [3]. VRO-22 and IC-033854 was also showed the moderately susceptible to shoot damage. Statistically VRO-3, VRO-22, VRO-4 and IC-033854 varieties had no significant difference with each other. Higher mean percent shoot infestation was recorded from variety PUSA SAWANI (31.20%) and IC-45831 (30.01%), as this is in close conformity with that of Gautam *et al*. (2014) [3] and Kanjarla (2006) [5]. Statistically PUSA SAWANI and IC-45831 had no significant difference with each other.

**Percent fruit infestation (Number basis) during *kharif* 2016.**
Minimum mean Percent fruit infestation were recorded from variety HRB-9-2(7.01 %) followed by IC-117076 (8.54%). Statistically HRB-9-2 and IC-117076 varieties had no significant difference with each other. Gautam *et al.* (2014) [3]

reported HRB-9-2 as moderately resistant to fruit damage. VRO-4 (39.16%) and IC-45831 (36.98%) showed the susceptible to fruit damage as in the studies done by Netam (2003) and Kanjarla (2006) [5]. VRO-22 (38.44%) and VRO-3 (37.76%) was also showed the susceptible to fruit damage. Higher mean Percent fruit infestation were recorded from variety PUSA SAWANI (39.30%), as this is in close conformity with that of Gautam *et al*. (2014) [3]. Afzal *et al.* (2015) [1] also reported PUSA SAWANI as susceptible variety. Mastoi *et al*. (2013) [6] observed more than 30% fruit infestation in PUSA SAWANI. PUSA SAWANI, VRO-4, VRO-22, VRO-3 and IC-45831 varieties were statistically *on par* with each other. The variety IC-033854 was showed 25.39% fruit damage with a significant difference from all remaining varieties.

**Percent fruit infestation (Weight basis) during *kharif* 2016.**

Minimum Percent fruit infestation were recorded from variety HRB-9-2 (5.78 %) followed by IC-117076 (7.03%). Statistically HRB-9-2 and IC-117076 varieties had no significant difference with each other. Higher Percent fruit infestation were recorded from variety PUSA SAWANI (32.42%) followed by VRO-4 (32.25%), VRO-22 (31.65%), VRO-3 (31.09%) and IC-45831 (30.45%). PUSA SAWANI, VRO-4, VRO-22, VRO-3 and IC-45831 were statistically *on par* with each other. Kanjarla (2006) [5] reported IC-45831 as highly susceptible variety. The variety IC-033854 was showed 21.22% fruit damage with a significant difference from all remaining varieties.

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