Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
JEZS 2018; 6(2): 71-75

Received: 11-01-2018
Accepted: 12-02-2018

Navneet
Department of Entomology, Naini Agricultural Institute, Sam Higginbottom University of Agriculture, Technology and Sciences, Allahabad, Uttar Pradesh, India

Anoorag R Tayde
Department of Entomology, Naini Agricultural Institute, Sam Higginbottom University of Agriculture, Technology and Sciences, Allahabad, Uttar Pradesh, India

Krishna Gupta
Department of Entomology, Naini Agricultural Institute, Sam Higginbottom University of Agriculture, Technology and Sciences, Allahabad, Uttar Pradesh, India

Ghanendra Pal Patel
Department of Entomology, Naini Agricultural Institute, Sam Higginbottom University of Agriculture, Technology and Sciences, Allahabad, Uttar Pradesh, India

Pushpendra Singh Sahu
Department of Entomology, Naini Agricultural Institute, Sam Higginbottom University of Agriculture, Technology and Sciences, Allahabad, Uttar Pradesh, India

Hadi Husain Khan
Department of Entomology, Naini Agricultural Institute, Sam Higginbottom University of Agriculture, Technology and Sciences, Allahabad, Uttar Pradesh, India

Correspondence
Navneet
Department of Entomology, Naini Agricultural Institute, Sam Higginbottom University of Agriculture, Technology and Sciences, Allahabad, Uttar Pradesh, India

Screening of different okra genotypes against major sucking pests

Navneet, Anoorag R Tayde, Krishna Gupta, Ghanendra Pal Patel, Pushpendra Singh Sahu and Hadi Husain Khan

Abstract
The present investigation was carried out during *rabi* season (March - June) 2017 at central research farm of SHUATS, Allahabad in RBD with three replications. The ten okra genotypes viz. HRB-55, H14-A, JPM-20-16-32, IIVR-10, IC-14-934, IC-45862, JC-034-1124-A, VRO-6, 317-10-1, 326-10-1 were taken to know their response on incidence of major sucking pests viz., Aphid (*Aphis gossypii)*, Jassid *(Amrasca biguttula biguttula)* and Red cotton bug *(Dysdercus cingulatus)*. Among these ten genotypes VRO-6 showed the lowest mean population of aphid (1.57) and IIVR-10 showed the lowest mean population jassid (1.82) and red cotton bug (2.23). The highest population of all pests was recorded in genotype 317-10-1. It is observed that the population of all sucking pests reached the peak level on 22nd standard week.

Keywords: Aphid, genotypes, okra, sucking pest

Introduction
Okra *Abelmoschus esculentus* L. (Moench), belongs to family Malvaceae, is an economically important vegetable crop grown in tropical and sub-tropical parts of the world. This crop is suitable for cultivation as a garden crop as well as on large commercial farms. Cultivated okra is polyploid in nature (Joshi and Harda, 1956). The somatic (2n) chromosome number in the genus *Abelmoschus* ranges from 72 to 144.It is grown commercially in India, Turkey, Iran, Western Africa, Yugoslavia, Bangladesh, Afghanistan, Pakistan, Burma, Japan, Malayasia, Brazil, Ghana, Ethiopia, Cyprus and the Southern United States. India ranks first in the world with 6.34 million tons (72% of the total world production) of okra produced from over 0.51 million hectare land (NHB 2014-15). In U.P. area, production and productivity of okra is 14.18 thousand hac, 181.66 thousand tones, 12.2 metric tons per hectare respectively (NHB 2014-15).

Okra is known by many local names in different parts of the world. It is called lady's finger in England, gumbo in the United States of America, guino-gombo in Spanish, guibeiro in Portuguese and bhindi in India. It is quite popular in India because of easy cultivation, dependable yield and adaptability to varying moisture conditions. Even within India, different names have been given in different regional languages (Chauhan, 1972).

It has good nutritional value. Per 100 g of edible portion of okra contain calories 35.0, Moisture 89.6 gm., Carbohydrates 6.4 gm., Protein 1.9 gm., Fat 0.2 gm., Fibre 1.2 gm., Minerals 0.7 gm., Phosphorus 56.0 mg., Sodium 6.9 mg., Sulphur 30.0 mg., Calcium 66.0 mg., Iron 1.5 mg., Potassium 103 mg., Magnesium 53 mg., Copper 0.19 mg., Riboflavin 0.01 mg., Thiamine 0.07 mg., Nictonic acid 0.06 mg., Vitamin C 13.10 mg., Oxalic acid 8.0 mg. (Gopalan *et al.*, 2007).

Okra is attacked by a number of insect pests, in this shoot and fruit borer, whitefly, jassids and yellow vein mosaic diseases are the major constraints. There are about 13 major insect and non-insect pests species, which attack this crop at various stages of growth (Dhamdhere *et al.*, 1984). Unfortunately, okra is the worst sufferer of shoot and fruit borer (*Earias vittella* Fab.), which is main bottleneck for cultivation of this crop. Under different agro-climatic conditions, the losses may vary from 10.1 to 50.0 per cent (Kashyap and Verma, 1983).

Materials and Methods
The experiment was conducted during the *Rabi* season 2016- 2017 at Central research field of SHUATS, Allahabad which is situated at 25.27º North latitude 80.50º East longitude and at an

altitude of 98 mt. above sea level. The climate is typically semi-arid and subtropical. The maximum temperature reaches up to 49^0 C in summer and drops down to 1.5^0 C in winter. The site selected was uniform, cultivable with typical sandy loam soil having good drainage.

The experiments were conducted with ten okra genotypes viz. HRB-55, H14-A, JPM-20-16-32, IIVR-10, IC-14-934, IC-45862, JC-034-1124-A, VRO-6, 317-10-1 and 326-10-1 in three replication. Size of plots was 1×2 m^2 and sown with the spacing of 45×30 cm. The crop was raised following all standard agronomical practices and no any chemical pesticides were used. The observations were recorded on weekly intervals throughout the cropping season. To record the observations three leaves each from top, middle and lower part per plant were considered for major sucking pests like, jassids, (*Amrasca biguttula biguttula),*whitefly, (*Bemisia tabaci*), aphid (*Aphis gossypii*). To assess the incidence of red cotton bug (*Dysdercus cingulatus*). The number of nymph and adults per plant were counted and recorded at weekly intervals on (15 plants/ genotype) randomly selected plants. The observations were recorded till the crop harvested. To assess the incidence of different sucking pests per plant was counted and recorded at weekly intervals on randomly selected five plants per plot. The population dynamics were determined by correlating following weather parameters.

The coefficient of correlation was worked out by equation (Sharma *et al.* 2010):

$$r = \frac{n\sum xy - \left(\sum x\right)\left(\sum y\right)}{\sqrt{n\left(\sum x^2\right) - \left(\sum x\right)^2}\sqrt{n\left(\sum y^2\right) - \left(\sum y\right)^2}}$$

Where:

r= Simple correlation coefficient

X= Independent variable (meteorological parameter)

Y= Dependent variable

N= Number of observation

Result and Discussion

Seasonal abundance of Aphid (*A. gossypii*) on different okra cultivars

The incidence of *A. gossypii* commenced from 3rd week of april (16th SMW) on cultivars IC-140934 and 317-10-1 (on tables). The *A. gossypii* population reached the peak infestation level at 21st SMW, JPM-20-16-32 (15.46/3leaves), IIVR-10 (6.93/3 leaves), JC-034-1124-A (8.26/3leaves), 317-10-1 (16.33/3leaves), 22nd SMW, HRB-55 (7.86/3leaves), H14-A (12.93/3leaves), IC-140934 (11.33/3 leaves), IC-45862 (12.06/3leaves), VRO-6 (check) (4.06/3leaves), 23rd SMW 326-10-1(12.46/3leaves). Dugger and Richter, 1998 reported that peak incidence of aphids were noticed in 21 st July on cotton crop in California. The results are in line that reported by Dhamdhere *et al.*, 1984, as he reported peak population of A. gossypii in last week of June.

Correlation co-efficient between okra pest *A. gossypii* and weather parameters

The statistically analyzed data (Tables) revealed that the aphid incidence on HRB-55 genotype positive significant correlation with rainfall (r = 0.66), positively non-significant correlation with maximum temperature (r = 0.17) minimum temperature (r = 0.48), evening RH (r = 0.31), wind velocity (r = 0.26) and negative correlation with morning RH (r = -0.44) and sunshine (r = -0.22). Genotype H14-A rainfall (r = 0.52) is positively significant, maximum temperature (r= 0.14), minimum temperature (r = 0.48), evening relative humidity (r= 0.33) and wind velocity (r = 0.28) are positively not significant, whereas morning RH (r = -0.50) and sunshine (-0.05) shows negative correlation. Genotype JPM-20-16-32 positively non-significant correlation with maximum temperature (r = 0.46), minimum temperature (r = 0.3) evening relative humidity (r = 0.2), rainfall (r = 0.39) wind velocity (r = 0.33) and sunshine (r = 0.05) and morning relative humidity (- 0.42) negative correlation. Genotype IIVR 10 positively non-significant correlation with maximum temperature (r = 0.14), minimum temperature (r = 0.36) evening relative humidity (r = 0.22), rainfall (r = 0.20) wind velocity (r = 0.26) and sunshine (r = 0.17) and morning relative humidity (- 0.47) is negative correlation. Genotype IC-140934 positively non-significant correlation with maximum temperature (r = 0.33), minimum temperature (r = 0.4) evening relative humidity (r = 0.27), rainfall (r = 0.43) wind velocity (r = 0.34) and sunshine (r = 0.05) and morning relative humidity (r = -0.5) is negative correlation. Genotype IC-45862 maximum and minimum temperature (r = 0.33, r = 0.41) evening relative humidity (r = 0.30) rainfall (r = 0.45), wind velocity (r= 0.31) and sunshine (r= 0.01) are positively non-significant, and morning relative humidity (r= -0.48) negative correlation. Genotype JC-034-1124-A maximum and minimum temperature (r = 0.30, r = 0.39) evening relative humidity (r = 0.29) rainfall (r = 0.33), wind velocity (r= 0.28) and sunshine (r= 0.08) are positively non-significant, and morning relative humidity (0.46) negative correlation. Genotype VRO-6 (check) minimum temperature (r = 0.58) is positively significant, maximum temperature (r= 0.3), evening relative humidity (r= 0.41), rainfall (r = 0.52) and wind velocity (r = 0.11) are positively not significant, whereas morning RH (r = -0.42) and sunshine (-0.10) shows negative correlation. Genotype 317-10-1 maximum and minimum temperature (r = 0.25, r = 0.41) evening relative humidity (r = 0.22) rainfall (r = 0.34), wind velocity (r= 0.31) and sunshine (r= 0.11) are positively non-significant and morning relative humidity (r= -0.57) negative correlation. Genotype 326-10-1 maximum and minimum temperature (r = 0.12, r = 0.43) evening relative humidity (r = 0.21) rainfall (r = 0.40), wind velocity (r= 0.24) and sunshine (r= 0.06) are positively non-significant and morning relative humidity (r= -0.56) negative correlation.

Seasonal abundance of Jassid (*A. biguttula biguttula*) on different okra cultivars

The incidence of *A. biguttula biguttula* commenced from 3rd week of april (16th SMW) on cultivars H14-A, IC-140934, IC-45862 and 317-10-1 (on tables). The *A. biguttula biguttula* population reached the peak infestation level at 21st SMW, JPM-20-16-32 (14.66), IIVR-10 (6.33/3leaves), IC-140934 (16.73/3leaves), IC-45862 (14.73/3leaves), JC-034-1124-A (7.06/3leaves) and 317-10-1 (17.6/3leaves), 22nd SMW HRB-55 (5.86/3leaves), and H14-A (11.66/3leaves), 23rd SMW, VRO-6 (check) (10.93/3 leaves) and 326-10-1 (12.06/3leaves) recorded. The results are similar to the finding of Gosh *et al.*, *(*1999) and Patel *et al.*, (2009) and Nagar *et al.* (2017) has also reported the similar result in variety IIVR-10.

Correlation co-efficient between okra pest *A. biguttula biguttula* and weather parameters

The statistically analyzed data (Tables) revealed that the jassid incidence on HRB-55 genotype positively significant correlation with minimum temperature (r = 0.53) and rainfall (r = 0.50), positively non-significant correlation with

maximum temperature (r = 0.08), evening RH (r = 0.32), wind velocity (r = 0.24) and negative correlation with morning RH (r = -0.58) and sunshine (r = -0.07). Genotype H14-A maximum temperature (r= 0.15), minimum temperature (r = 0.48), evening relative humidity (r= 0.22), rainfall (r = 0.46) wind velocity (r = 0.32) and sunshine (r= 0.02) are positively not significant, whereas morning RH (r = -0.63) shows negative correlation. Genotype JPM-20-16-32 maximum temperature (r= 0.45), minimum temperature (r = 0.35), evening relative humidity (r= 0.16), rainfall (r = 0.38) wind velocity (r = 0.33) and sunshine (r= 0.07) are positively not significant, whereas morning RH (r = -0.55) shows negative correlation. IIVR 10 maximum temperature (r= 0.12), minimum temperature (r = 0.36), evening relative humidity (r= 0.22), rainfall (r = 0.16) wind velocity (r = 0.29) and sunshine (r= 0.29) are positively not significant, whereas morning RH (r = -0.54) shows negative correlation. Genotype IC-140934 maximum temperature (r = 0.54) is positively significant, minimum temperature (r = 0.25) evening relative humidity (r = 0.05), rainfall (r = 0.26) wind velocity (r = 0.35) and sunshine (r = 0.20) shows positively non-significant correlation and morning relative humidity (r = -0.59) is negative correlation. Genotype IC-45862 maximum temperature (r= 0.38), minimum temperature (r = 0.38), evening relative humidity (r= 0.16), rainfall (r = 0.37) wind velocity (r = 0.35) and sunshine (r= 0.12) are positively not significant, whereas morning RH (r = -0.61) shows negative correlation. Genotype JC-034-1124-A maximum temperature (r= 0.16), minimum temperature (r = 0.44), evening relative humidity (r= 0.24), rainfall (r = 0.36) wind velocity (r = 0.30) and sunshine (r= 0.10) are positively not significant, whereas morning RH (r = -0.59) shows negative correlation Genotype VRO-6 (check), minimum temperature (r = 0.44), evening relative humidity (r= 0.22), rainfall (r = 0.42) wind velocity (r = 0.07) are positively not significant, whereas maximum temperature (r= -0.26), morning RH (r = -0.37) and sunshine (r= 0.14) shows negative correlation. Genotype 317-10-1 maximum and minimum temperature (r = 0.33, r = 0.39) evening relative humidity (r = 0.13) rainfall (r = 0.45), wind velocity (r= 0.35) and sunshine (r= 0.08) are positively non-significant, and morning relative humidity (r= -0.62) shows negative correlation. Genotype 326-10-1 maximum and minimum temperature (r = 0.11, r = 0.47) evening relative humidity (r = 0.26) rainfall (r = 0.46), wind velocity (r= 0.25) and sunshine (r= 0.02) are positively non-significant and morning relative humidity (r= -0.57) shows negative correlation.

Seasonal abundance of Red cotton bug (*D. cingulatus*) on different okra cultivars

The incidence of *D. cingulatus* commenced from 3rd week of april (16th SMW) on cultivars IC-45862, 317-10-1 and 326-10-1 (on tables). The *D. cingulatus* population reached the peak infestation level at,21st SMW, H14-A (13.33/plant), JPM-20-16-32(15.53/ plant) IIVR-10 (7.86/ plant) IC-140934 (15.8/plant), IC-45862 (14.87/plant) and JC-034-1124-A (7.13/plant), 22nd SMW HRB-55 (8.26/plant), VRO-6 (check) (8.66/plant), 317-10-1 (16.33/plant) and 326-10-1 (13.4/plant) recorded. This result is similar to the finding reported by Chauhan *et al.*, (2016) and Verma *et al.*, (2013). Similarly results also reported by Boopathi *et al.*, (2011) in Mizoram.

Correlation co-efficient between okra pest *D. cingulatus* and weather parameters

The statistically analyzed data (Tables) revealed that the red cotton bug incidence on HRB-55 genotype positively significant correlation with rainfall (R= 63). Maximum temperature (r = 0.45), minimum temperature (r = 0.37), evening RH (r = 0.25), rainfall (r = 0.63) and wind velocity (r = 0.32) are positively not significant whereas negative correlation with morning RH (r = -0.43) and sunshine (r = -0.12). Genotype H14-A maximum temperature (r= 0.26), minimum temperature (r = 0.49), evening relative humidity (r= 0.31), rainfall (r= 0.44) and wind velocity (r = 0.25) are positively not significant, whereas morning RH (r = -0.53) sunshine (r= -0.02) shows negative correlation. Genotype JPM-20-16-32 maximum temperature (r= 0.45), minimum temperature (r = 0.30), evening relative humidity (r= 0.15), rainfall (r = 0.29), wind velocity (r = 0.33) and sunshine (r= 0.16) are positively not significant, whereas morning RH (r = -0.53) shows negative correlation. IIVR 10 maximum temperature (r= 0.18), minimum temperature (r = 0.35), evening relative humidity (r= 0.18), rainfall (r = 0.22) wind velocity (r = 0.28) and sunshine (r= 0.24) are positively not significant, whereas morning RH (r = -0.54) shows negative correlation. Genotype IC-140934 maximum temperature (r = 0.37), minimum temperature (r = 0.34), evening relative humidity (r = 0.16), rainfall (r = 0.37) wind velocity (r = 0.36) and sunshine (r = 0.16) shows positively non-significant correlation and morning relative humidity (r = -0.56) is negative correlation. Genotype IC-45862 sunshine (r= 0.08) is positively significant, maximum temperature (r= 0.33), minimum temperature (r = 0.43), evening relative humidity (r= 0.28), rainfall (r = 0.34), wind velocity and (r = 0.30) are positively not significant, whereas morning RH (r = -0.55) shows negative correlation. Genotype JC-034-1124-A maximum temperature (r= 0.15), minimum temperature (r = 0.46), evening relative humidity (r= 0.25), rainfall (r = 0.36) wind velocity (r = 0.29) and sunshine (r= 0.10) are positively not significant, whereas morning RH (r = -0.59) shows negative correlation Genotype VRO-6 (check), rainfall (r= 0.54) positively significant, maximum temperature (r= 0.05), minimum temperature (r = 0.47), evening relative humidity (r= 0.25) and wind velocity (r = 0.17) are positively not significant, whereas morning RH (r = -0.44) and sunshine (r= -0.16) shows negative correlation. Genotype 317-10-1 minimum temperature (r= 0.50) is positively significant, maximum (r = 0.20) evening relative humidity (r = 0.27), rainfall (r = 0.49) and wind velocity (r= 0.28) are positively non-significant and morning relative humidity (r= -0.59) and sunshine (r= -0.02) shows negative correlation. Genotype 326-10-1 rainfall (r = 0.41) is positively significant, maximum and minimum temperature (r = 0.26, r = 0.42) evening relative humidity (r = 0.19)) and wind velocity (r= 0.33) are positively non-significant and morning relative humidity (r= -0.62) and sunshine (r = -0.03) shows negative correlation.

Table 1: Seasonal abundance of Aphid (*A. gossypii*) on different okra cultivars

Standered week	week after sowing	HRB 55	H14-1	JPM-20-16-32	IIVR 10	IC-140934	IC-45862	JC-034-1124-A	VRO-6	317-10-1	326-10-1	Mean
14	2	0	0	0	0	0	0	0	0	0	0	0
15	3	0	0	0	0	0	0	0	0	0	0	0
16	4	0	0	0	0	0.33	0	0	0	0.2	0	0.053
17	5	0	0.13	0	0	1.33	0.33	0	0	1.73	0	0.352
18	6	0.33	1.73	0.4	0	2	1.8	0.2	0	3.13	2.8	1.239
19	7	1.26	5.46	6.13	0.33	9.33	8.47	4.13	0.33	8.06	5.02	4.852
20	8	5.06	10.4	13.93	4.86	11.33	12	6.8	2.06	12.06	7.33	8.583
21	9	4.06	9.66	15.46	6.93	10.73	11.2	8.26	2.73	16.33	9.8	9.516
22	10	7.86	12.93	12.6	3.26	11.33	12.06	5.86	4.06	12.46	10.24	9.266
23	11	5.06	9.73	5.6	4.33	6.86	7.26	4.53	5.06	11.86	12.46	7.275
24	12	2.6	6.73	1.26	1.97	4.66	4.53	2.33	4.06	6.2	5.13	3.947
25	13	1.8	2.66	0.6	0.26	1.73	2.06	0.86	1.26	2.06	1.66	1.495
26	14	0	0.26	0	0	0.89	0.57	0.53	0.87	0	0.13	0.325
Mean		2.15	4.59	4.30	1.68	4.65	4.63	2.57	1.57	5.69	4.19	

Table 2: Seasonal abundance of Jassid (*A. biguttula biguttula*) on different okra cultivars

Standered week	week after sowing	HRB 55	H14-1	JPM-20-16-32	IIVR 10	IC-140934	IC-45862	JC-034-1124-A	VRO-6	317-10-1	326-10-1	Mean
14	2	0	0	0	0	0	0	0	0	0	0	0
15	3	0	0	0	0	0	0	0	0	0	0	0
16	4	0	0.06	0	0	0.73	0.6	0	0	0.33	0	0.172
17	5	0.6	2.74	1.47	0.13	3.4	2.07	0.53	0	2.93	0	1.387
18	6	1.93	4.2	4.06	1.46	8.2	6.26	1.8	0.33	5.73	3.73	3.77
19	7	2.06	4.33	6.13	2.2	12.6	8.47	2.34	0.46	7.4	5	5.099
20	8	3.46	10.4	12.4	4.66	14.33	12.2	5.06	1.06	13.4	8.33	8.53
21	9	5.66	11	14.66	6.53	16.73	14.73	7.06	2.26	17.6	10.8	10.703
22	10	5.86	11.66	11.3	3.26	11.2	12.13	5.53	7.06	16.33	12	9.633
23	11	4.46	10.93	6.53	4.06	6.4	8.06	5.26	10.93	13.4	12.06	8.209
24	12	4.06	7.33	2.46	1.46	2	5.06	3.66	5.06	5.4	6.73	4.322
25	13	1.86	2.73	1.73	0	1.33	1.93	0.93	2.06	1.86	2.13	1.656
26	14	0	0	0	0	0	0	0	0.4	0	0.4	0.08
Mean		2.30	5.02	4.67	1.82	5.91	5.5	2.47	2.27	6.49	4.7	

Table 3: Seasonal abundance of Red cotton bug (*D. cingulatus*) on different okra cultivars

Standered week	week after sowing	HRB 55	H14-1	JPM-20-16-32	IIVR 10	IC-140934	IC-45862	JC-034-1124-A	VRO-6	317-10-1	326-10-1	MEAN
14	2	0	0	0	0	0	0	0	0	0	0	0
15	3	0	0	0	0	0	0	0	0	0	0	0
16	4	0	0	0	0	0	0.4	0	0	0.27	0.13	0.08
17	5	0	0.46	1.2	0	1.46	1.42	0.4	0	1.53	1.07	0.75
18	6	1.26	2.33	3.67	1.4	5.33	3.06	1.6	0.13	4.33	2.06	2.51
19	7	4.86	3.66	7.4	2.53	9.4	7.46	2.34	0.93	6.53	4.66	4.97
20	8	6.33	9.46	12.6	4.86	13.4	13.26	5.13	2.46	12.2	8.34	8.8
21	9	4.66	13.33	15.53	7.86	15.8	14.87	7.13	6.86	15.4	10.46	11.19
22	10	8.26	11.13	10.26	4.26	13.33	11.26	5.6	8.66	16.33	13.4	10.24
23	11	3.26	7.33	6.4	5.46	8.4	7.8	5.26	8.53	13.46	10.33	7.62
24	12	1.33	4.86	2.13	2.73	5.2	5.86	3.53	3.66	7.66	4.26	4.12
25	13	1.13	2.53	0.73	0	0.33	2.86	1.06	2.13	3.73	1.26	1.57
26	14	0.46	1.46	0.12	0	0	1.07	0.26	0.4	1.22	0.27	0.52
MEAN		2.42	4.35	4.61	2.23	5.58	5.33	2.48	2.59	6.35	4.32	

Conclusion

Okra is a one of the most important vegetable crop which is grown all over the world. Many different varieties are used to grown in Allahabad but very few of them are suitable for the climate of this region. Many insect pests and disease attack on okra but major pests are *Aphis gossypii*, *Amrasca biguttula biguttula, Bemisia tabaci, Dysdercus_cingulatus***,** *Earias vittella*. In present research, out of 10 genotypes only VRO-6 and IIVR-10 showed resistance against sucking pests. So thatVRO-6 and IIVR-10 are suitable for Allahabad region. Under proper surveillance genotypeHRB-55 may also be grown.

Acknowledgement

We are grateful thanks to Dean of Director of Research who allotting field for this research work at central field of Sam Higginbottom University of Agriculture, Technology and Sciences, Allahabad, U.P.

References

1. Boopathi T, Pathak KA. Relationship between weather Factors and Sucking pest of okra in Mizoram. Madras Agriculture Journal. 2011; 99(1-3):133-135.
2. Boopathi T, Pathak KA, Singh BK, Kumar A. Seasonal incidence of major insect pests of okra in the north eastern hill region of India. Pest Management in Horticultural Ecosystems. 2011; 17(2):99-108.
3. Chauhan DVS. Vegetable Production in India, 3rd ed. Ram Prasad and Sons, Agra, 1972.
4. Chauhan S, Chandrakar G, Nirala YS, Rana N. Study of major insects pests in okra genotypes in india. India. Advances in Life Sciences. 2016; 5(2):384-387.
5. Dhamdhere SV, Bhadur I, Mishra US. Studies on occurrence and succession of pests of okra at Gwalior. Indian J Plant Prot. 1984; 12(1):9-12.
6. Dugger SB, Richer D. Mid season cotton aphids infection in California, effect on cotton yield. Proceeding of beltwise cottan conference, 1998, 1056-1058.
7. Gopalan C, Rama Sastri BV, Balasubramanian S. Nutritive Value of Indian Foods 2nd ed. National Institute of Nutrition (NIN), ICMR, 2007, 47-58.
8. Gosh J, Gosh SK, Chatterjee H, Senapati SK. Pest constraints of okra under Terairegion of West Bengal. Indian Journal of Entomology. 1999; 63:362-371.
9. Joshi AB, Hardas MW. Alloploid nature of okra, *Abelmoschus esculentus* (L.) Moench. Nature. 1956, 178-190.
10. Kashyap RK, Verma AN. Seasonal incidence of spotted bollworm, Earias spp. on okra at Hissar. Indian Journal of Ecology. 1983; 9(1):156-159.
11. Nagar J, Khinchi SK, Kumawat KC, Sharma A. Screening different varieties of okra [*Abelmoschus esculentus* (L.) Moench] against sucking insect pests. Journal of Pharmacognosy and Phytochemistry. 2017; 6(3):30-34.
12. Patel PS, Patel GM, Shukla NP. Screening of various okra varieties against important pests, Pestology. 2009; 33(2):30-35.
13. Sharma M, Bagati S, Singh AK, Salgotra RK, Bhardwaj R, Rai SK, *et al.* Geneic variability, heritability and correlation coefficients of yield and its component traits in basmati rice (O*ryza sativa* L.). SABRAO Journal of Breeding and Genetics. 2010; 48(4):445-452.
14. Verma S, Haseeb M, Manzoor U. Study of seasonal incidences in okra sucking pests India, Insect Environment. 2013; 19(3):142-146.