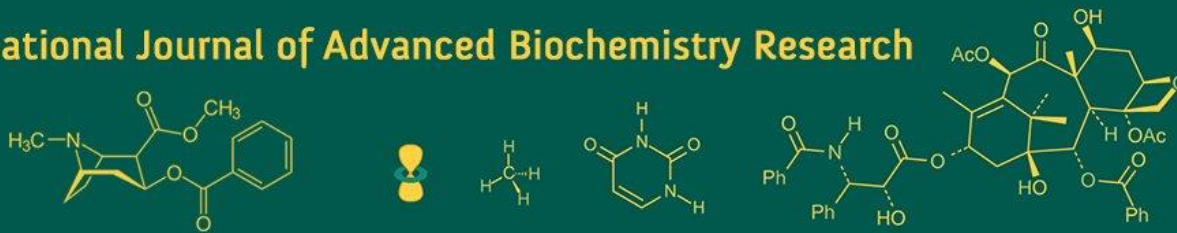


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Studies on population dynamics of sucking pests in brinjal (*Solanum melongena* L.)

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Abstract

The investigations were carried out during *kharif* 2022, on the farm of college of agriculture, Badnapur, tal- Badnapur, dist-Jalna, department of Agricultural Entomology, College of Agriculture, Badnapur, Vasantnao Naik Marathwada Krishi Vidyapeeth, Parbhani with the objectives of study the population dynamics of major insect pests of brinjal, The experiment was laid out in non-replicated treatments. The incidence population of aphid, leafhopper and white fly, varied from (0.5 to 2.1 aphids/3 leaves), (2.3 to 7.4 leafhopper/3 leaves) and (0.4 to 8.5 whiteflies/3 leaves), respectively. Dynamics of aphids, white fly and leafhopper and their correlation with weather parameters revealed that white fly, aphid, and leafhopper had positive significant correlation with relative humidity at morning.

Keywords: Population dynamics, aphids, white fly, leaf hopper, brinjal

Introduction

Brinjal is one of the most common tropical vegetables grown in India. It is also well-liked in the USA, France, Italy, and Egypt. It is a flexible crop used in a variety of agroclimatic zones and can be farmed all year round. A large number of cultivars differing in size, shape and colour of fruits are grown in India. 100 grams of edible brinjal parts have the capacity to provide 4.0 g. vitamins A, B, and C, 1.4 g of protein and carbs. Moreover, Brinjal is well-known for its ability to treat diabetes, toothaches, and liver problems. Brinjal is grown over 760 thousand acres of land in India and it produces an annual 12.61 million tonnes of output in 2021–22. The entire area covered by brinjal in Maharashtra covers 26,000 acres yielding 578 million tonnes having a fruit production rate of 22.23 MT per hectare yearly. West Bengal is a notable state in area (161.50 thousand acres) and brinjal production (2,965 thousand tonnes). In India, States that produce the most brinjal include Orissa, Bihar, Karnataka, West Bengal, Andhra Pradesh, Karnataka and Utter Pradesh.

Materials and Methods

The field experiment was conducted to study the population dynamics of major insect pests of brinjal during *kharif* season 2022. The locally available variety of brinjal i.e. Panchganga was sown in non-replicated 100 m sq. area adopting spacing of 60 X 45 cm to conduct a field trail on population dynamics. The plot was kept untreated till harvest to asses the highest potential of multiplication of major prevailing pests in brinjal under natural condition. The surveillance of major prevailing pests in brinjal under natural condition. The surveillance of brinjal crop for the population dynamics of major insect pests was done through out the growing season of crop and continued till the final harvest of crop. Observations on the population of sucking pests was recorded by randomly selecting 10 plants from experimental area at weekly intervals starting from 15 days after transplanting and The meteorological data was recorded simultaneously along with pests. The data statistically analyzed by standard analysis of variance method suggested by Panse and Sukhatme (1967) [5].

Table 1: Seasonal incidence of sucking pests in brinjal in relation to weather parameter.

SMW	Crop Pests			Weather Parameter				
	Leaf hopper	White Fly	Aphid	Temperature (°C)		Rainfall (mm)	R.H. (%)	
				Max.	Min.		Mor.	Even.
32	2.3	00	00	27	22.5	18.5	89	90
33	3.2	00	00	24.3	22.5	9.0	88	82.2
34	4.2	0.4	0.5	27.5	22	00	91	83
35	7.4	1.2	0.7	31	23.5	68.0	87	84
36	6.6	2.3	0.8	28	23	120.5	92	92
37	6.1	3.5	1.2	27	23.5	72.0	94	92
38	4.9	3.9	1.0	28.5	23.5	12.0	95	91
39	4.5	4.6	1.1	29	22.5	6.5	91	92
40	4.1	5.5	1.3	25	23	18.0	92	80
41	5.7	8.5	2.1	26	22	30.0	97	71
42	6.5	6.2	1.4	25	22	80.5	98	71
43	6.1	7.2	1.2	25	21	00	96	71

Results and Discussion

The study of population dynamics of insect pest in brinjal was carried out during *kharif* 2022 on research farm of college of agriculture Badnapur. The crop was grown on 100 m² area and kept untreated till harvest to record the activities of sucking pest. The abundance of white flies was noticed from 34th SMW till 43rd SMW. Though the population of white flies was during the season (0.4 to 8.5/3leaves). The peak incidence of whiteflies on cotton was recorded between the 44th and 48th SMW (November) according to Prasad *et al.*, (2008). the table 2 indicated that correlation coefficient of white flies population with the weather parameters marked that the temperature maximum ($r = -0.203$), temperature minimum ($r = -0.355$), relative humidity at evening ($r = -0.423$) and rainfall ($r = -0.092$) were negatively correlated with the activities of white flies but were non-significant whereas the relative humidity at morning ($r = 0.714$) had statistically significant positive impact over the population of white flies. Chundawat and Ameta (2011) ^[1] reported that negative correlation with total rainfall.

Table 2: Studies on correlation coefficient between sucking pests of Brinjal in relation to weather parameter

Name of pest	Correlation coefficient (r)				Rainfall
	Temperature (°C)		Relative humidity		
	Maximum	Minimum	Morning	Evening	
Leaf hopper	0.361NS	0.236 NS	0.493 NS	-0.095 NS	0.517 NS
Aphid	0.039 NS	-0.138 NS	0.622*	-0.253 NS	0.037 NS
White fly	-0.203 NS	-0.355 NS	0.714**	-0.423 NS	-0.092 NS

**significant at 1%

The occurrence of aphids was recorded in the 34th SMW (0.5/3 leaves) and gradual increase was seen till 41st SMW (2.1/3leaves). According to Nirmal *et al.*, (2018) ^[3] the population of *Aphis gossypii* peaked in the 40th SMW. The population of aphid was correlated with the weather parameters. Temperature maximum ($r = 0.039$) and rainfall ($r = 0.037$) had positive impact and non-significant coefficient whereas temperature minimum ($r = -0.138$) and relative humidity at evening ($r = -0.253$) registered negative correlation but non-significant. The relative humidity at morning ($r = 0.622$) was helpful significantly for the multiplication of the aphid population. According to Rawat *et al.*, (2020) ^[7] Aphids and maximum temperatures and

rainfall exhibited a non-significant positive connection ($r = 0.527$ and $r = 0.096$).

Incidence of leaf hopper was noticed in 32nd SMW (2.3/3 leaves) and highest recorded in the 35th SMW (7.4/3leaves). Similar results were reported by Pal *et al.*, (2013) who stated that the leafhopper infestation started in the fourth week of July and peaked in the second and fourth weeks of September. The data presented in table 2 was related to correlation coefficient between weather parameters and population of Leaf hopper indicates that the maximum temperature ($r = 0.361$), minimum temperature ($r = 0.236$), relative humidity at morning ($r = 0.493$) and rainfall ($r = 0.517$) had positive impact i.e. congenial for the growth of leaf hopper but it was statistically non-significant. Relative humidity at evening ($r = -0.095$) had negative impact that shows adverse effect on the growth of population of leaf hopper However it was also non-significant. These results are consistent with those of Mahmood *et al.*, (2002) ^[2] who noted a positive association between the occurrence of leafhoppers and the maximum and minimum temperatures.

Conclusion

Studies on population dynamics of sucking pests of brinjal was revealed that insect pests *i.e.* leafhopper, aphids and white fly prevailed in entire cropping season of *kharif* 2022. Population dynamics of aphids, white fly and leafhopper and their correlation with weather parameters from 32th to 43th SMW, revealed that white fly, aphid and leafhopper had positive significant correlation with relative humidity at morning.

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