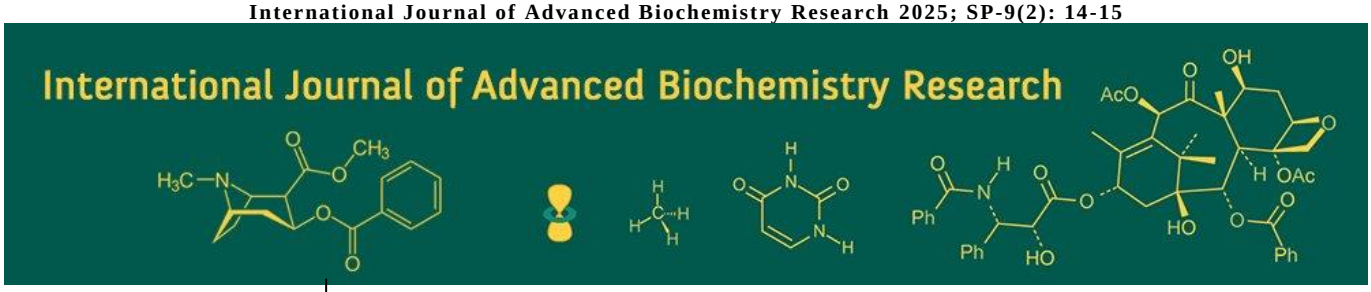

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Studies on population dynamics of natural enemies (Lady Bird beetle & predatory stink bug) in brinjal

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Abstract
The present investigations 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, Vasantrao 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 100 m sq. area. The ladybird beetle and predatory stink bug was observed from 32th SMW whereas attack of white fly and aphid started from 34th SMW. The population of ladybird beetle and predatory bug varied from (0.2 to2.3 LBB/3 leaves) and (0.3 to 2.6 PSB/3leaves), respectively. Dynamics of ladybird beetle and predatory stink bug and their correlation with weather parameters revealed that lady bird beetle and predatory stink bug had positive significant correlation with relative humidity at morning.

Keywords: Population dynamics, lady bird beetle, predatory stink bug, brinjal

Introduction
Brinjal is one of the most common and popular vegetable crops grown in north east India. It can be grown in almost all parts of this region round the year except in high altitudes. It is a flexible crop used in a variety of agroclimatic zones and can be farmed all year round. 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 throughout 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 incidence of brinjal fruit and shoot borer was recorded in terms of percentage of infested plants, number of larvae per ten plants (by splitting the damaged fruits) and percentage of damaged fruits (number and weight basis) in terms of percentage of damaged fruits on number and weight was recorded by counting and weighing healthy and damaged fruits at each picking. The meterological data was recorded simultaneously along with pests.

The data statistically analyzed by standard analysis of variance method suggested by Panse and Sukhatme (1967) [2].

Table 1: Seasonal incidence of insect pest and natural enemies in brinjal in relation to weather parameter.

SMW	Natural enemies		Weather parameter				
	Lady bird beetle	Predatory stink bug	Temperature (°C)		Rainfall (mm)	R.H. (%)	
			Max.	Min.		Mor.	Even.
32	0.2	0.3	27	22.5	18.5	89	90
33	0.3	0.4	24.3	22.5	9.0	88	82.2
34	1.1	1.00	27.5	22	00	91	83
35	1.2	1.3	31	23.5	68.0	87	84
36	1.6	1.8	28	23	120.5	92	92
37	2.4	2.00	27	23.5	72.0	94	92
38	1.2	2.1	28.5	23.5	12.0	95	91
39	1.3	2.4	29	22.5	6.5	91	92
40	2.0	1.6	25	23	18.0	92	80
41	**2.3**	**2.6**	26	22	30.0	97	71
42	1.5	1.9	25	22	80.5	98	71
43	1.8	2.4	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 m^2 area and kept untreated till harvest to record the activities of major insect pest as well as their natural enemies. The data incorporated in Table 1 revealed that inception of the activities of natural enemies were recorded with the occurrence of natural enemies *i.e.* Lady bird beetle was noticed from 32th SMW (0.2 LBB/plant). It was at its peak in 41th SMW *i.e.* (2.3 LBB/plant). The lady bird beetle coincided with the highest population of aphid, white flies as well as per cent shoot and fruit damage (*L. orbonalis*). The overall population of lady bird beetle observed in the range of 0.2-2.3 LBB/plant. Maximum population of lady bird beetle was recorded in 41th SMW (2.3 LBB/plant). Findings of Gaikwad *et al*., (2020 a) [5] were more or less similar to the present trends for the coccinellid population, indicating that the coccinellid population was initially noted during the 31st SMW (30 July-05 Aug) and gradually rose in the subsequent weeks. During the 40th SMW, the maximal activity (2.90/plant) was noted. According to Meena and Kanwat (2010) [1] the coccinellid beetles started appearing in the first week of August and peaked in the first week of October. The activities of natural enemies were recorded with the occurrence of sucking pests *i.e.* predatory stink bug was noticed during 32th SMW (0.3 PSB/plant). It was at its peak in 41th SMW *i.e.* (2.6 PSB/plant). The overall population of predatory stink bug observed in the range of 0.3-2.6 PSB/plant. Maximum population of predatory stink bug was recorded in 41th SMW (2.6 PSB/plant).

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

Name of pest	Correlation coefficient (r)				
	Temperature (°C)		Relative humidity		Rainfall
	Maximum	Minimum	Morning	Evening	
Lady bird beetle	-0.091 NS	0.007 NS	0.648*	-0.280 NS	0.302 NS
Predatory stink Bug	0.067 NS	-0.141 NS	0.739**	-0.241 NS	0.126 NS

**significant at 1%

Conclusion

Studies on population dynamics of insect pests of brinjal was revealed that insect pests i.e. shoot and fruit borer, leafhopper, aphids and white fly prevailed in entire cropping season, of *kharif* 2022. Population dynamics of per cent shoot damage, per cent fruit damage, aphids, white fly and leafhopper and their correlation with weather parameters from 32th to 43th SMW, revealed that white fly, aphid, per cent shoot damage, lady bird beetle and predatory stink bug had positive significant correlation with relative humidity at morning.

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