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Short Comminucation

Population dynamics of mango hopper, *Idioscopus niveosparsus* Leth and its natural enemies under coastal Konkan conditions of Maharashtra

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Mango hopper is one of the most serious pests responsible for about 46 per cent losses in fruit yield. Three species of mango hoppers *viz., Amritodus atkinsoni* Leth, *Idioscopus clypealis* Leth and *Idioscopus niveosparsus* Leth are commonly observed all over India, however, during recent years only *I. niveosparsus* has been the most predominant species in Konkan region of Maharashtra (Dhangar, 2004). The adults and nymphs of mango hopper suck cell sap from tender foliage, inflorescence and tender fruits. As a result, the tender leaves get twisted, the inflorescence become weak and shedding of flowers and tender fruits take place that badly affect the yield. Besides, hopper excrete honey dew on which black sooty mould, *Capnodium mangiferae* grows which interferes with the photosynthetic activity of leaves and reduces the size and quality of fruits. Several natural enemies of mango hopper have been reported by some earlier workers (Chaudhari *et al*. 2014; Misal *et al.* 2010).

Under the changing climatic conditions, the intensity of mango hopper is increasing in Konkan region. Also, it has been observed that the peak intensity period has been changed. Therefore, it was necessary to undertake the studies on population dynamics of mango hopper *I. niveosparsus* along with its natural enemies under Konkan conditions of Maharashtra.

The experiment was conducted at the mango farm of Regional Fruit Research Station, Vengurle (Dr. B.S. Konkan Krishi Vidyapeeth, Dapoli, Maharashtra) during 2013-14 and 2014-15. A block of 40 trees (Cv. Alphonso) was selected and kept unsprayed throughout the study period. Out of these 40 trees, ten trees were selected randomly. On each of the randomly selected tree ten panicles were selected randomly and labeled. The observations on hopper population were recorded by direct visual counting method at weekly interval. For recording observations on the population of natural enemies associated with mango hopper in mango orchard, four quadrants of 1 sq.m. area were selected all along the tree canopy on five randomly selected trees (Godase *et al*.,2004).

The corresponding meteorological data *viz.*, temperature (maximum and minimum), relative humidity (morning and evening) and sunshine hours recorded in the observatory of Regional Fruit Research Station, Vengurle were used to work out the correlation with the pest population.

Population dynamics of mango hopper I. niveosparsus

The pooled data on population dynamics of mango hopper with their natural enemies and abiotic factors recorded during 2013-14 and 2014-15 is presented in Table 1. From the data it is evident that the hopper population initiated in the 49th SMW. At that time the hopper population was 5.2 hoppers/ panicle which increased gradually and reached to the peak of 17.1 hoppers/ panicle during 3rd SMW corresponding to the 13th week of January. Thereafter, the hopper population declined gradually and from 10th SMW onwards it was found negligible (below 2 hoppers/panicle or shoot).

The correlation coefficient worked out between mango hoppers and abiotic factors revealed significant negative correlations with maximum temperature (r=-0.571*), minimum temperature (r= -0.814*) and evening relative humidity (r=-0.423*) (Table 1).

Population dynamics of natural enemies of mango hopper

There were three different natural enemies *viz*., spiders, chrysopids and coccinellids predating on mango hopper at flowering and fruiting period during both the years at Regional Fruit Research Station, Vengurle (Table1). From the data it is revealed that the spider population was maximum (1.1spider/quadrant) in the 7th SMW. The correlation studies revealed that there was positive but non-significant correlation between hopper and spider (r= 0.100).

Table 1: Population dynamics of mango hopper (*I. niveosparsus*) with their natural enemies and abiotic factors (Pooled data of 2013-14 and 2014-15)

SMW No.	Temperature (°C)		Relative humidity (%)		Sunshine hours (hrs/day)	Mean hopper population/ panicle	Mean natural enemies population/ quadrant		
	Max.	Min.	Morning	Evening			Spiders	Chrysopids	Coccinellids
49	33.7	19.2	89.3	51.7	8.0	5.8	0.7	0.3	0.1
50	33.2	19.8	87.1	51.9	7.7	5.8	0.7	0.3	0.1
51	33.1	18.3	85.3	50.3	7.8	8.0	0.8	0.3	0.1
52	32.8	19.0	87.9	54.7	8.2	9.3	0.7	0.4	0.1
1	31.9	19.0	89.9	60.0	7.1	12.4	0.7	0.3	0.2
2	32.4	16.9	86.1	61.9	8.4	15.9	0.8	0.4	0.2
3	32.1	18.6	86.3	59.4	8.4	**17.1**	0.7	0.3	0.2
4	32.7	19.8	84.1	56.1	7.5	12.9	0.8	0.4	0.2
5	33.8	18.6	89.2	59.6	8.3	10.9	0.9	**0.6**	**0.4**
6	33.6	17.7	85.6	56.7	9.0	8.1	0.9	0.6	**0.4**
7	32.7	17.9	87.1	54.0	9.0	6.8	**1.1**	0.6	0.3
8	33.4	20.2	88.1	65.5	8.9	4.2	1.0	0.4	0.3
9	31.6	20.9	85.6	53.7	8.4	2.8	1.0	0.3	0.1
10	32.8	21.2	88.5	58.1	8.8	1.7	1.0	0.3	0.1
11	34.1	22.8	83.5	62.5	8.5	1.6	1.1	0.3	0.1
12	32.8	24.4	88.9	64.6	7.4	1.4	1.1	0.3	0.1
13	33.3	25.0	86.9	61.2	7.4	1.1	0.7	0.3	0.1
14	34.2	23.6	81.9	60.9	8.1	1.1	0.8	0.3	0.2
15	32.8	23.7	81.8	60.7	9.5	1.2	0.8	0.3	0.1
16	33.4	25.7	84.4	68.1	8.6	1.2	0.6	0.3	0.1
17	34.0	26.3	84.0	65.6	7.4	1.1	0.8	0.3	0.1
18	34.3	26.5	77.0	63.9	9.6	1.0	0.7	0.3	0.1
19	34.1	25.4	79.8	65.8	8.2	1.0	0.6	0.3	0.0
20	33.9	26.9	75.9	65.2	8.7	0.8	0.7	0.2	0.0
21	33.9	27.2	78.9	63.6	8.4	0.5	0.5	0.2	0.0
22	34.4	27.3	77.8	63.9	8.0	0.4	0.4	0.2	0.0
Correlation coefficient between hopper population, abiotic and biotic factors (natural enemies)									
	-0572*	-0.814	0.497	-0.423	-0.188	-	0.100	0.488*	0.622*

***significant at 5% level of significance**

The chrysopid population was maximum (0.6 chrysopid / quadrant) in the 5th SMW. The correlation studies indicated significant positive correlation (r= 0.488*) between the hopper and chrysopid population. These findings are in close conformity with Misal (2010) who reported the chrysopid, *Mallada boninensis* as major predator of mango hopper. The coccinellid population was maximum (0.4 coccinellid/quadrant) in the 5th SMW. The correlation coefficient worked out between hopper and coccinellid population indicated significant positive correlation (r=0.622*). These findings are in accordance with Zagade and Chaudhary (2010) who recorded sixteen species of coccinellids in mango agro ecosystem.

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