SHORT COMMUNICATION

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Incidence of ber butterfly, *Tarucus indica* in Bikaner district of Rajasthan.

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Ber is the most important arid fruit crop contributing over 80 per cent of the total fruit area in Bikaner district of western part of Rajasthan and cultivated in approximately 600 ha area in the district. During recent past, a decline in its productivity has been observed and there are many factors responsible for it. Among those, incidences of pests and diseases have been found significant. As many as 80 insect species have been found feeding on ber tree in India (Butani, 1979). Ber fruit fly is one of the major insect causing considerable damage to the crop. Beside it, ber butterfly, *Tarucus indica* was reported in Gujarat on ber (Shah et al, 1990) has been pest of minor significance. However, for last few years, it has become the most destructive pest of ber in the district. Keeping in view the severity the present investigation has been made in order to study a delicate relationship of weather factor to the larva population and incidence and current status of *T. indica* at different locations of Bikaner district. The observations of larvae were recorded at weekly interval at ber orchard Krishi Vigyan Kendra, Bikaner. Five full grown trees were selected at random. From each selected tree, 20 leaves were taken at random from top, middle and bottom parts. For counting larval population, the mean values of larvae infestation per tree for each orchard under given location were calculated. Meteorological data regarding temperature ^{0}C (maximum and minimum) per cent relative humidity (morning and evening) were obtained from the meteorological observatory, Agriculture Research Station, Beechwal, Bikaner from July to December. The weekly means of the above parameters were computed for the standard weeks. Correlation coefficients (r-value) for the larva of ber butterfly and abiotic factors responsible for seasonal variations were worked out. A comprehensive visits in all the ber growing area of district Bikaner were made during the last week of July, 08 and first week of Aug' 08 to study the incidence of *T. indica* at different locations. As many as 16 locations of Bikaner, Kolayat, Nokha, Dungargarh and Lunkaransar were visited and from each orchard, observations of larva per tree were recorded.

Seasonal incidence of ber butterfly was studied during 2008 under unsprayed condition. The population of larvae was recorded at weekly interval starting from first week of July to the last week of November. Data presented in Table-1 depicted that the larvae of ber butterfly appeared on the crop in the first week of July and built up in the population started from 31st standard week *i.e.* first week of August and continued to increase up to the last week of September and declined gradually till November. The population of larvae ranged from 1.10 to 10.20. The peak activity of larvae (10.20/tree) was recorded in first fortnight of August. The data on correlation between larval incidence and abiotic factor presented in Table-2 revealed that the maximum and minimum temperature showed positive correlation with larvae (r= 0.16 and r= 0.61). The morning relative humidity (r= 0.77), evening relative humidity (r= 0.69) and mean relative humidity (r= 0.76) had significant positive correlation with larvae. The rainfall also showed positive correlation.

Data on incidence of *T. indica* in different locations of Bikaner district are presented in table 3. The average number of larva per tree was maximum (15.08) at Kolayat tehsil followed by Nokha (13.67), Dungargarh (11.93), Bikaner (10.58) and Lunkaransar (10.55). In Kolayat tehsil the average number of larvae per tree ranged from 11.12 to 18.46 where as these was recorded maximum in Diyatra village and minimum in maandal village. The range of larva per tree was observed 11.55 to 16.45 in Nokha tehsil followed by 9.20 to 15.73, 9.60 to 11.82 and 8.33 to 12.66 in Dungargarh, Bikaner and Lunkaransar tehsils, respectively. The minimum number of larvae was observed in Jagdevwala village of Lunkaransar tehsil.

Severity of the pest, a number of visits of different ber orchards of Bikaner and Kolayat tehsils were undertaken in the month of August, September and October to know the current status of the pest. Five orchards from three locations were visited. In each orchard, five full grown trees were selected at random. From each selected tree, 20 leaves were taken at random from top, middle and bottom parts. For counting caterpillar population, the mean

Table 1. Seasonal incidence of ber butterfly on ber

St. Week	Observation period	Temperature (°C)		Relative humidity (%)			Rainfall (mm)	Popu. of larvae/plant
		Max.	Min.	Mor.	Eve.	Mean		
27	03 July to 09 July	40.3	29.9	58.2	34.2	46.2	0.0	2.10
28	10 July to 16 July	37.7	27.4	76.2	42.4	59.3	4.9	2.20
29	17 July to 23 July	38.2	28.6	60.71	35.6	48.155	0.0	3.20
30	24 July to 30 July	39.8	29.3	63.3	33.14	48.22	7.0	3.00
31	31 July to 06 Aug.	35.7	27.1	85.9	70.1	78	98.5	8.10
32	07 Aug. to 13 Aug.	35.3	26.6	80.2	33.8	57	23.0	10.20
33	14 Aug. to 20 Aug.	36.6	26.7	83.7	49.7	66.7	0.0	8.22
34	21 Aug. to 27 Aug.	37.1	26.5	68.1	34.4	51.25	0.0	9.32
35	28 Aug. to 03 Sept.	37.2	27.1	72.8	35.6	54.2	0.0	7.60
36	04 Sept. to 10 Sept.	36.6	25.5	73.4	40.5	56.95	0.0	5.12
37	11 Sept. to 17 Sept.	36.8	24.9	74.1	35.8	54.95	0.0	4.14
38	18 Sept. to 25 Sept.	36.1	24.0	78.5	44.3	61.4	0.0	4.30
39	26 Sept. to 02 Oct.	36.1	24.2	74.6	33.2	53.9	0.0	2.70
40	03 Oct. to 09 Oct.	39.4	24.6	63.14	21.6	42.37	0.0	1.10
41	10 Oct. to 16 Oct.	38.6	23.4	56.6	18.8	37.7	0.0	0.00
42	17 Oct. to 23 Oct.	36.3	19.8	61.7	21.6	41.65	0.0	0.00
43	24 Oct. to 30 Oct.	36.1	17.8	46.5	13.8	30.15	0.0	0.00
44	31 Oct. to 06 Nov.	35.0	17.5	47.8	19.7	33.75	0.0	0.00
45	07 Nov. to 13 Nov.	34.4	16.5	50.71	15.4	33.055	0.0	0.00
46	14 Nov. to 20 Nov.	38.4	13.3	63.6	33.6	48.6	0.0	0.00
47	21 Nov. to 27 Nov.	28.0	8.9	53.29	18.2	35.745	0.0	0.00
48	28 Nov. to 04 Dec.	29.1	8.3	58.14	19.6	38.87	0.0	0.00

Table 2. Correlation co-efficients (r-value) between population of larvae and abiotic factors

S.No.	Weather parameters	Larval population/tree
1	Maximum temperature °C	0.16 NS
2	Minimum temperature °C	0.61*
3	Relative humidity morning %	0.77*
4.	Relative humidity evening %	0.69*
5	Average relative humidity %	0.76*
6	Rainfall (mm)	0.31 NS

* Significant at 5 % level

NS = Non significant

Table 3. Level of incidence of ber butterfly *T. indica* in Bikaner district

S.No.	Tehsil	Location surveyed	Av. No. of larvae/tree	Overall mean & range/tehsil
1.	Bikaner	Pemasar	11.82 ± 2.11	10.58
		K.V. K, Farm	10.33 ± 1.92	(9.60 – 11.82)
		Hussinsar	9.60 ± 1.48	
2.	Kolayat	Diyatra	18.46 ± 1.11	15.08
		Kolayat	15.67 ± 1.67	(11.12 – 18.46)
		Mandal	11.12 ± 2.88	
3.	Nokha	Nokha	16.45 ± 2.15	13.67
		Deshnok	13.01 ± 1.45	(11.55 – 16.45)
		Maniyana	11.55 ± 1.18	
4.	Dungagarh	Dungargarh	15.73 ± 1.77	11.93
		Likhmidshar	10.88 ± 1.11	(9.20 – 15.73)
		Uppani	9.20 ± 2.25	
5.	Lunkaransar	Jagdevwala	8.33 ± 1.48	10.55
		Hansera	10.17 ± 1.32	(8.33 – 12.66)
		Khajuwala	12.66 ± 3.01	

values of caterpillar infestation per tree for each orchard under given location were calculated.

During the visit, it was observed that the butterflies appeared on ber in the month of May, June and remained active up to October and November. These butterflies can be seen on shrubs throughout the year. The butterflies (20 to 30mm in wing expense) had dark brown black body and light blue coloured wings with dark spots. There were also dark black oval spots on head, thorax and wing base. The full grown caterpillars were generally heavy, flashy and slug like and yellowish green in colour. The head of the caterpillars was yellowish orange and red. The caterpillar constitutes the destructive stage. They feed on young leaves by scrapping chlorophyll in lines leaving behind a white transparent layer, later on resulted fall off leaves. In severely infested trees, the bearing capacity of trees was adversely affected. The young plants were completely defoliated. Thus this pest could be devastating in the nursery and young plantation. The data on incidence of ber caterpillar are present in Table 1 revealed that average number of caterpillar per tree was maximum (18.46) at Diyatra in Kolayat tehsil followed by Beechwal (9.2) and Pemasar (6.6) of Bikaner tehsil. Keeping in view the severity of incidence of this pest there is need to work out effective control of this pest in ber orchard

Reference

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