SEASONAL INCIDENCE OF PREDATORY THRIPS (*Scolothrips indicus* PRIESNER) ON ROSE UNDER POLYHOUSE CONDITIONS

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ABSTRACT

Study on seasonal incidence on predatory thrips (Scolothrips indicus Priesner) on rose under polyhouse conditions was carried out at Department of Floriculture and Landscaping, ASPEE College of Horticulture and Forestry, Navsari Agricultural University, Navsari, Gujarat during 2015 and 2016. Seasonal incidence of S. indicus revealed that, the predatory thrips population observed from 2nd week of July to 3rd week of July. Its correlation with maximum temperature, minimum temperature and average temperature was positive and significant.

KEY WORDS: Predatory thrips, Rose, Seasonal incidence, Scolothrips indicus

INTRODUCTION

Flower, the most beautiful and fascinating part of nature, have power to overwhelm anybody's heart with love, happiness and joy. The area under floricultural crops in India is 2,42,710 hectares with production of 15,45,250 Metric tonnes. As far as Gujarat state is concerned, the area under flower production is 19,670 ha (Anonymous, 2016). Rose has been the world's most favourite and unchallenged flower and reigned supreme as the "Queen of flowers". A title bestowed on it by the Greek poetess "Sappho" and none has since questioned its right to the title. Rose plant is attacked by number of insect pests like bud borers, thrips, scales, aphids, weevils, chafer beetles, leaf eating caterpillars and non insect pest like two spotted spider mite. Among the non-insect pests, the two spotted spider mite, Tetranychus urticae Koch is the most important one causing serious damage to rose and other crops grown in polyhouse as well as in open field. Biological control, using natural enemies, is an alternative strategy to manage mites in agricultural systems. Predatory thrips, S. indicus proved effective biological control against two spotted spider mite. Species of the thripid genus Scolothrips are well known as predators of mites on the leaves of plants (Gilstrap 1995), and under the name "six-spotted thrips" these insects are sometimes marketed as biocontrol agents. Recognition of an adult thrips as being a member of the genus *Scolothrips* is particularly easy, due to the presence of six (rarely five) pairs of exceptionally long setae on the pronotum as well as a similar pair arising between the ocelli.

MATERIALS AND METHODS

The study on seasonal incidence of predatory thrips, *S. indicus* infesting rose

were carried out during 2015 to 2016 at polyhouse, Department of Floriculture and Landscaping, ASPEE College of Horticulture and Forestry, Navsari Agricultural University, Navsari. The observations on the incidence of predatory thrips were recorded at weekly interval, beginning from January 2015 and continued up to December 2016 on rose cv. Top secret. For sampling, three random leaves representing top, middle and bottom canopy were selected from each of twenty five randomly selected plants per bed.

RESULTS AND DISCUSSION

The data recorded on the seasonal incidence of predatory thrips, *S. indicus* were presented and discussed year wise as well as pooled over of two years.

2015

Under the present investigation, the activities of predatory thrips, *S. indicus* was also observed and the data on the activities of *S. indicus* were presented in Table 1. The activities of predatory thrips, *S. indicus* starts during 6th SMW (1st week of February) with the mean population of 0.03 predatory thrips per leaf. The average temperature and relative humidity were 25.74ºC and 82.01 per cent, respectively. The activities of *S. indicus* gradually fluctuated and peak was observed during 28th SMW (2nd week of July), where the mean population of predatory thrips, *S. indicus* was 2.67 predatory thrips per leaf. Average temperature and relative humidity were 32.37ºC and 56.06 per cent, respectively. The yearly mean of predatory thrips, *S. indicus* was 0.90 predatory thrips per leaf.

The correlation studies were worked out between predatory thrips, *S. indicus* with abiotic factors (Table 2). There were a highly significant positive correlation between population of *S. indicus* with maximum temperature (r=0.553), minimum temperature (r=0.714) and average temperature (r=0.682). The average relative humidity at the time of observation had a significant negative correlation (r= -0.284) with *S. indicus* population.

2016

The data on population of predatory thrips, *S. indicus* was presented in Table 1. The activities of predatory thrips, *S. indicus* starts during 7th SMW (2nd week of February) with the mean population of 0.03 predatory thrips per leaf. The average temperature and relative humidity were 21.74ºC and 56.50 per cent, respectively. The activities of *S. indicus* gradually fluctuated and peak was observed during 29th SMW (3rd week of July), where the mean population of predatory trips *S. indicus* was 2.44 predatory thrips per leaf. The average temperature and relative humidity were 32.80ºC and 84.78 per cent, respectively. The yearly mean of predatory thrips, *S. indicus* was 0.85 predatory thrips per leaf.

The correlation studies were worked out between predatory thrips, *S. indicus* with abiotic factors (Table 2). It is seen that there were a highly significant positive correlation between population of *S. indicus* with minimum temperature (r=0.876), average temperature (r=0.703) and average relative humidity (r= 0.720). The maximum temperature at the time of observation had a significant positive correlation (r= 0.300) with *S. indicus* population.

Pooled

The data on population of predatory thrips, *S. indicus* was presented in Table 1. The activities of predatory thrips, *S. indicus* starts during 6th with the mean population of 0.02 thrips per leaf. Average temperature and relative humidity were 24.01ºC and 68.73 per cent, respectively. The activities of *S. indicus* gradually fluctuated and peak was observed during 29th SMW, where the mean population of predatory thrips, *S. indicus* was 2.36 predatory thrips per leaf.

The average temperature and relative humidity were 31.78ºC and 72.04 per cent, respectively. The yearly mean of predatory thrips, *S. indicus* was 0.87 predatory thrips per leaf.

The correlation studies were worked out between predatory thrips, *S. indicus* with abiotic factors (Table 2). It is seen that there were a highly significant positive correlation between population of *S. indicus* with minimum temperature (r=0.438), maximum temperature (r=0.820), average temperature (r=0.706) and average relative humidity (r= 0.365).

It is more or less similar results were also recorded by Pokle and Shukla (2016) on tomato. They reported that activity of predatory thrips, *S. indicus* during 4th week of June and it showed a significant positive correlation with eggs and mobile stages of *T. urticae*. The predatory thrips population also had a significant positive correlation with average temperature and relative humidity of polyhouse.

CONCLUSION

From the study, it can be concluded that predatory thrips *S. indicus* population was observed maximum from 2nd week of July to 3rd week of July on rose under the polyhouse.

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Table 1: Seasonal incidence of predatory thrips, *S. indicus* on rose (cv. Top secret) under polyhouse conditions

SMW	Mean number of predatory thrips per leaf			Temperature (o C)									Average RH%		
				Year 2015			Year 2016			Pooled			Year 2015	Year 2016	Pooled
	Year 2015	Year 2016	Pooled	Max.	Min.	Ave.	Max.	Min.	Ave.	Max.	Min.	Ave.			
1	2	2	4	5	6	7	8	9	10	11	12	13	14	15	16
1	0.00	0.00	0.00	30.33	14.20	22.27	33.91	14.20	24.06	32.12	14.20	23.16	59.52	69.85	64.69
2	0.00	0.00	0.00	32.34	15.40	23.87	32.70	11.69	22.19	32.52	13.54	23.03	62.57	63.70	63.13
3	0.00	0.00	0.00	31.04	13.70	22.37	28.93	10.47	19.70	29.99	12.09	21.04	66.54	53.95	60.24
4	0.00	0.00	0.00	29.41	15.00	22.21	30.89	12.70	21.79	30.15	13.85	22.00	71.82	65.00	68.41
5	0.00	0.00	0.00	31.24	20.60	25.92	32.61	15.00	23.81	31.93	17.80	24.86	71.90	65.75	68.83
6	0.03	0.00	0.02	33.37	18.10	25.74	31.09	13.50	22.29	32.23	15.80	24.01	82.01	55.45	68.73
7	0.08	0.03	0.05	33.83	19.90	26.86	30.27	13.20	21.74	32.05	16.55	24.30	84.08	56.50	70.29
8	0.09	0.04	0.07	32.13	17.80	24.97	33.44	15.10	24.27	32.79	16.45	24.62	83.54	62.90	73.22
9	0.12	0.07	0.09	32.02	18.90	25.46	35.09	17.80	26.44	33.55	18.35	25.95	81.70	68.55	75.13
10	0.16	0.08	0.12	34.11	21.60	27.86	34.69	16.64	25.66	34.40	19.12	26.76	67.10	70.95	69.03
11	0.24	0.11	0.17	33.91	23.80	28.86	34.30	17.61	25.96	34.11	20.71	27.41	66.60	82.35	74.48
12	0.33	0.19	0.26	34.54	27.00	30.77	37.13	18.17	27.65	35.84	22.59	29.21	64.05	85.20	74.63
13	0.41	0.24	0.33	36.69	24.60	30.64	38.83	18.76	28.79	37.76	21.68	29.72	59.45	83.15	71.30
14	0.59	0.31	0.45	37.50	25.60	31.55	35.61	20.67	28.14	36.56	23.14	29.85	57.59	62.00	59.80
15	0.69	0.40	0.55	35.90	26.30	31.10	37.61	20.23	28.92	36.76	23.26	30.01	56.40	62.50	59.45
16	0.85	0.56	0.71	38.11	29.60	33.86	37.33	22.06	29.69	37.72	25.83	31.78	51.00	55.55	53.28
17	0.97	0.71	0.84	38.80	31.20	35.00	34.60	22.04	28.32	36.70	26.62	31.66	51.60	56.44	54.02
18	1.12	0.91	1.01	40.10	29.40	34.75	40.70	23.26	31.98	40.40	26.33	33.36	48.85	68.88	58.87
19	1.23	1.01	1.12	37.83	28.30	33.06	38.40	26.00	32.20	38.11	27.15	32.63	46.31	72.11	59.21
20	1.33	1.17	1.25	40.60	31.80	36.20	40.90	28.60	34.75	40.75	30.20	35.48	48.56	69.75	59.16
21	1.48	1.29	1.39	43.90	32.20	38.05	44.30	30.90	37.60	44.10	31.55	37.83	46.65	69.47	58.06
22	1.72	1.41	1.57	44.50	33.70	39.10	46.40	27.26	36.83	45.45	30.48	37.96	50.46	65.97	58.21
23	1.79	1.56	1.67	44.20	34.60	39.40	45.50	30.00	37.75	44.85	32.30	38.58	52.15	79.30	65.73
24	1.92	1.69	1.81	44.90	33.80	39.35	44.30	27.54	35.92	44.60	30.67	37.64	45.85	74.63	60.24
25	2.03	1.85	1.94	43.50	32.20	37.85	44.50	31.90	38.20	44.00	32.05	38.03	51.70	71.91	61.81
26	2.13	2.03	2.08	41.70	29.30	35.50	43.00	30.20	36.60	42.35	29.75	36.05	49.40	84.41	66.90
27	2.24	2.23	2.23	40.30	26.61	33.46	41.90	31.70	36.80	41.10	29.16	35.13	52.16	88.36	70.26

Table 1: Contd….

1	2	2	4	5	6	7	8	9	10	11	12	13	14	15	16
28	2.33	2.32	2.33	38.60	26.14	32.37	39.00	29.40	34.20	38.80	27.77	33.29	56.06	86.22	71.14
29	2.28	2.44	2.36	36.30	25.23	30.76	36.70	28.90	32.80	36.50	27.06	31.78	59.30	84.78	72.04
30	2.12	2.43	2.27	34.80	23.60	29.20	33.00	26.50	29.75	33.90	25.05	29.48	59.60	88.22	73.91
31	2.03	2.33	2.18	35.50	23.80	29.65	30.90	25.50	28.20	33.20	24.65	28.93	63.70	91.57	77.63
32	1.91	2.19	2.05	34.20	24.34	29.27	29.99	23.66	26.82	32.09	24.00	28.05	63.10	90.11	76.60
33	1.79	2.04	1.91	31.69	24.50	28.09	30.97	24.66	27.81	31.33	24.58	27.95	62.23	82.89	72.56
34	1.69	1.85	1.77	32.26	24.56	28.41	30.67	24.17	27.42	31.46	24.36	27.91	65.06	82.27	73.66
35	1.59	1.68	1.63	32.76	23.76	28.26	31.17	24.01	27.59	31.96	23.89	27.93	70.58	81.12	75.85
36	1.39	1.52	1.45	33.83	22.41	28.12	30.91	23.09	27.00	32.37	22.75	27.56	74.14	79.72	76.93
37	1.29	1.33	1.31	32.64	22.69	27.66	31.07	22.76	26.91	31.86	22.72	27.29	85.93	81.87	83.90
38	1.20	1.17	1.19	29.91	23.21	26.56	29.53	22.79	26.16	29.72	23.00	26.36	83.84	92.32	88.08
39	1.09	1.04	1.07	33.36	21.87	27.61	31.91	22.33	27.12	32.64	22.10	27.37	75.24	83.92	79.58
40	0.93	0.89	0.91	36.51	23.80	30.16	30.59	23.10	26.84	33.55	23.45	28.50	71.17	88.49	79.83
41	0.81	0.76	0.79	36.10	23.26	29.68	31.19	21.90	26.54	33.64	22.58	28.11	76.41	83.22	79.82
42	0.72	0.64	0.68	38.93	21.76	30.34	34.33	19.06	26.69	36.63	20.41	28.52	61.13	69.00	65.07
43	0.56	0.53	0.55	36.90	21.37	29.14	33.86	17.47	25.66	35.38	19.42	27.40	66.26	59.96	63.11
44	0.45	0.39	0.42	35.47	19.93	27.70	32.69	16.43	24.56	34.08	18.18	26.13	61.80	62.10	61.95
45	0.36	0.31	0.33	36.29	19.06	27.67	34.26	13.70	23.98	35.27	16.38	25.83	58.87	50.81	54.84
46	0.31	0.23	0.27	36.19	19.73	27.96	33.97	15.14	24.56	35.08	17.44	26.26	60.88	52.61	56.74
47	0.19	0.16	0.17	34.97	20.81	27.89	33.94	12.57	23.26	34.46	16.69	25.58	60.36	45.52	52.94
48	0.08	0.11	0.09	34.69	17.81	26.25	34.49	12.34	23.41	34.59	15.08	24.83	57.91	51.40	54.66
49	0.03	0.04	0.03	35.00	14.07	24.54	33.41	14.44	23.93	34.21	14.26	24.23	54.48	49.58	52.03
50	0.00	0.00	0.00	31.50	11.47	21.49	32.84	12.49	22.66	32.17	11.98	22.08	59.10	48.45	53.77
51	0.00	0.00	0.00	31.13	10.47	20.80	32.86	13.67	23.26	31.99	12.07	22.03	49.15	48.57	48.86
52	0.00	0.00	0.00	32.31	11.44	21.88	32.31	11.43	21.87	32.31	11.43	21.87	44.04	48.79	46.41
Mean	0.90	0.85	0.87												

SMW = Standard Meteorological Week

Table 2: Correlation of predatory thrips, *S. indicus* with the abiotic factors of polyhouse on rose (cv. Top secret)

Abiotic parameters	Year 2015	Year 2016	Pooled
Maximum Temperature (oC)	0.553**	0.300*	0.438**
Minimum Temperature (oC)	0.714**	0.876**	0.820**
Average Temperature (oC)	0.682**	0.703**	0.706**
Average RH %	-0.284*	0.720**	0.365**

Significant at 5% level of significance (r= 0.273)
****Highly significant at 1% level of significance (r= 0.361)***

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