

ACTIVITY OF THRIPS AND THEIR NATURAL ENEMIES ON ROSE

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ABSTRACT:-The field experiment was conducted to study the activity of thrips and their natural enemies on rose at Rizwan Sidiqi Agricultural farm near Tando Jam during 2008. The result indicated that the maximum population of thrip was recorded on 2nd April ($15.78 \pm 0.79/\text{leaf}$) and ($18.32 \pm 0.86/\text{flower}$). Whereas the minimum population was observed on May, 28th ($0.96 \pm 0.20/\text{leaf}$) and ($2.28 \pm 0.30/\text{flower}$). It was found that the population of the pest was negatively correlated with temperature ($r = -0.3659$) and relative humidity ($r = -0.7578$). The data further revealed that the population of predatory spiders was maximum on April, 23rd ($3.27 \pm 0.36/\text{plant}$). The spiders showed positive correlation with thrip population ($r = 0.3751$). The feeding potential of predatory spiders was also tested in laboratory at Temp. 28 ± 2 °C and Relative humidity $65 \pm 5\%$. *Thomisus sp.* consumed greater number of thrips ($6.25 \pm 1.25/\text{day}$) followed by *Eusparassus sp.* (4.50 ± 1.06), *Marpissa carinata* (3.00 ± 0.87) and *Marpissa tenebrosa* (2.25 ± 0.75) respectively. There was significant difference in feeding efficiency amongst different predatory spiders at ($P < 0.05$).

Keywords: Population, Feeding efficiency, Thrip and Spiders.

INTRODUCTION

Rose, *Rosa indica* L. belongs to family Rosaceae order Rosales. Roses are very popular landscape plants grown for their beauty. It is attacked by number of insect pests that affect the growth of plants and reduce the quality of flowers. Thrip and aphid are major insect pests that damage the leaves and flowers by sucking the cell sap and reduce quality and quantity of plant [1]. Bio control agents have positive impact to keep the insect pests population below economic damage. It showed the successfulness of management strategy [2]. Consequently, natural enemies play a key role integrated pest management program. Release of biological control agents to suppress the pest population is safe to the environment and economical [3]; [4]; [5]. Spiders play a key role in suppressing the population of insect pests in natural ecosystem [6]; [7]. Amongst other predators spiders have unique groups in the agroecosystems. They play an important role biological control agent, mostly feed on soft bodied insect. Approximately 3500 species of spiders have been reported in the world [8]. The present study carried out to investigate the Thrips and their natural enemies on rose". This study shall open new area for pest control in future.

MATERIALS AND METHODS

The experiment was conducted at Rizwan Sidiqi Agricultural farm, about 2 km away from Tando Jam during 2008. A standard commercial grafted variety of rose were planted on well-prepared bed in five blocks of an acre (40 Ghunta). Each block consist an area of 8 ghunta. The distance between row to row 75 cm and 90 cm between plants to plant were maintained. Irrigation was applied at weekly intervals in summer and fortnight intervals during winter seasons. Other cultural practices were followed as per

recommendation. However, application of insecticides was avoided in the experimental plot for proper multiplication of predatory spiders during observations.

Field observations

For recording observations, 25 plants were selected randomly in five separate plots. Population of thrips was examined on flowers and leaves, whereas the natural enemies were examined on whole plant of rose at weekly intervals. Different species of spiders were collected by hand. Similarly aspirator was used for collection of thrips. Thrip insect pest and predatory spider species were collected and identified from Department of Zoology, Government College University, Faisalabad by Dr. Abdul Ghafoor, Assistant Professor and Mr. Muhammad Waseem Khan, Associate Professor, Faisalabad Agriculture University, Faisalabd Punjab. The collected data were subjected for statistical analysis. The agro-meteorological data on some abiotic factors were obtained from Regional Agro-met Centre, Tando Jam.

Predatory efficiency

To determine the feeding potential of predatory spiders on thrips both nymphs and adults were observed. The pests were collected with the help of aspirator from rose field and brought in the laboratory. Approximately 20 thrips were placed in the petri-dishes (5 cm dia.) on fresh leaves and petals of flower of rose and then different species of predatory spiders were released in each petri dish with the help of camel hairbrush. Each experiment was replicated four times. Pests fed by each predatory spider were counted after 24 hours and again the same numbers of thrips were provided.

RESULTS

A. Thrip, *Franklinella schltezei* (Trybon)

Table 1. Weekly (Mean \pm S.E) population of thrip and spiders on rose.

Date of observations	Thrip		Spiders	Temperature		R.H. %
	Leaves	Flowers		Min.	Max.	
05.03.2008	3.64 \pm 0.38	6.96 \pm 0.53	0.13 \pm 0.07	12.3	34.7	71.80
12.03.2008	5.86 \pm 0.48	9.56 \pm 0.62	0.28 \pm 0.11	14.1	32.5	69.14
19.03.2008	10.70 \pm 0.65	14.29 \pm 0.76	0.61 \pm 0.16	12.74	36.58	56.14
26.03.2008	12.35 \pm 0.70	15.53 \pm 0.79	1.07 \pm 0.21	14.85	37.75	47.00
02.04.2008	15.78 \pm 0.79	18.32 \pm 0.86	1.90 \pm 0.28	18.42	37.81	56.85
09.04.2008	14.10 \pm 0.75	16.50 \pm 0.81	2.29 \pm 0.30	18.01	34.92	68.14
16.04.2008	12.73 \pm 0.71	14.06 \pm 0.75	3.03 \pm 0.35	21.08	38.28	66.85
23.04.2008	8.98 \pm 0.60	11.60 \pm 0.68	3.27 \pm 0.36	19.31	34.0	56.14
30.04.2008	4.47 \pm 0.42	6.48 \pm 0.51	2.43 \pm 0.31	21.0	36.35	50.71
07.05.2008	2.91 \pm 0.34	4.45 \pm 0.42	1.65 \pm 0.26	23.5	40.42	64.28
14.05.2008	2.54 \pm 0.32	3.94 \pm 0.40	1.55 \pm 0.25	24.47	39.78	63.0
21.05.2008	1.12 \pm 0.21	3.86 \pm 0.39	1.15 \pm 0.06	25.44	38.78	61.0
28.05.2008	0.96 \pm 0.20	2.28 \pm 0.30	0.35 \pm 0.02	25.21	41.14	53.57

The mean population of thrips recorded on leaves and flowers of rose are presented in the table.1 The population of thrips was observed on 1st week of March, 05 (3.64 \pm 0.38/leaf) and (6.96 \pm 0.53/flower) the field temperature was observed at 12.3°C min. and 34.7°C max. and the relative humidity was 71.80 %. The population rises up gradually and reaches to maximum peak population during the 1st week of April, 02 (15.78 \pm 0.79/leaf) and (18.32 \pm 0.86/flower) the field temperature was observed at 18.42°C min. and 34.81 °C max. and the relative humidity was 56.85 %. The population gradually declined in the last week of April, 30 (4.47 \pm 0.42/leaf) and (6.48 \pm 0.51/flower) with increase in temperature at 21.0°C min. and 36.35°C max. The minimum population was (0.96 \pm 0.20/leaf) and (2.28 \pm 0.30/flower) recorded in the last week of May at the field temperature 25.21°C min. and 41.14°C max. and the relative humidity was 53.57 %. The thrip were seen in more numbers on flowers floral parts as compare to leaves, because it gives shelter from weather condition and help to escape from natural enemies. Temperatures also influenced on population build up of pest. The linear model of regression showed the predatory spiders have positive correlation with thrip insect pest, whereas mean temperature and mean relative humidity showed negative correlation with thrip population.

B. Spiders

There were four species of spiders were identified. The mean population of spiders recorded on plant of rose is given in the same table.1. The spider population was observed during 1st week of March was negligible. It was observed that (0.13 \pm 0.07/plant) at the field temperature 12.3°C min. and 34.7°C max. and the relative humidity was 71.80 %. When the pest population and temperature increased as well as the spider population rises up gradually reaches to its peak level during the month of April. The maximum population was observed in the 3rd week of April, 23 (3.27 \pm 0.36/plant) the field temperature was recorded 19.31°C min. and 34.0 °C max. and the relative humidity was 56.14 %. The populations fall down from 1st week of May, 07 (2.43 \pm 0.31/plant) with increase in

temperature and decreased in pest population numbers. The minimum population (0.35 \pm 0.02/plant) was recorded in the last week of May at the field temperature 25.21°C min. and 41.14°C max. and the relative humidity was 53.57 %. The results further indicated that when data on predatory spider analyzed statistically it varied significantly ($P \leq 0.05$) between the early phase of rose crop showed lower activity of predatory spiders, while in middle of season the predatory spiders remained more active this might be due to more presence of insect pest, in the middle of crop season. Temperature and relative humidity showed negative correlation with spider population

Feeding potential of spiders

Fig.1 shows the feeding potential of four spider species against thrip. The results indicated that the maximum feeding potential of *Thomisus sp.* (6.25 \pm 1.25) was recorded followed by *Eusparassus sp.* (4.50 \pm 1.06), *Marpissa carinata* (3.00 \pm 0.87) and *Marpissa tenebrosa* (2.25 \pm 0.75) respectively. *Thomisus sp.* consumed greater number of thrips followed by the rest of the species. The analysis of variance of the results were found significant at $P < 0.05$ level.

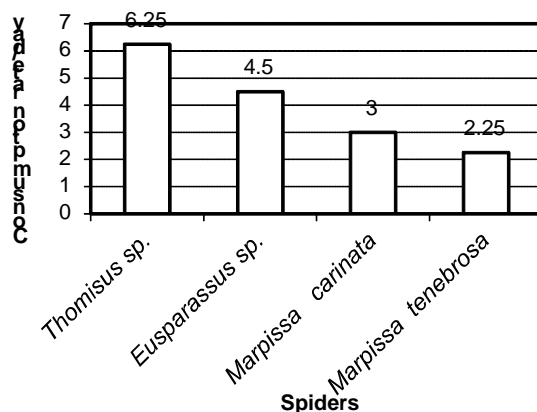


Figure 1 Feeding potential of different spider species on thrip.

DISCUSSION

It was found that rose crop commonly attacked by thrips. This result agreed with the findings of [9] who surveyed on rose during 1996-97 at Bhubaneswar, Orissa, India, reported that rose mostly attacked different species of thrips. The findings of our present study also supports with [10] who reported thrip population was high in January-March and low in May-July. The severe damage was observed from February-May. The damage percent of flowers varied in the range 14-88, 28-95 and 37-52% occurred during 1996, 1997 and 1998, respectively. It was seen that the egg mass highest on petals of fully open flower buds, it also observed that the adult and nymphs transfer towards the terminal portions of the plant as the shoots mature, and exploit the tender tissues of the flowers to reproduce, and then migrate [11]; [12]. The result of present study are also supported by the findings of [13] who investigated that spiders are mostly carnivorous arthropods prey on other insects on large scale without damaging the crops. The predatory spiders have wide host range, high searching ability and easily multiply in nature to use them as bio control agent against insect pests. Spiders belong to family lycosidae used against leaf hoppers to regulate its population in rice [14].

CONCLUSION

The population of thrips has positive correlation with spiders. The population of thrips has negative correlation with temperature and relative humidity. Thrips were found maximum on flower as compare to leaves. Four species of predatory spiders were recorded on rose garden and identified. Spider, *Thomisus sp.* consumed more number of thrips followed by rest of species.

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