

SEASONAL INCIDENCE OF PREDATORY MITE SPECIES, *AMBLYSEIUS INDICUS* AND *AMBLYSEIUS TERTANYCHIVORUS* ON OKRA AND BRINJAL CROPS

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ABSTRACT

A study was conducted to assess the population dynamics of two predatory mite *Amblyseius indicus* and *Amblyseius tertanychivorus* under field condition on two summer vegetable crops, viz. brinjal and okra. Maximum population of *Amblyseius indicus* and *A. tertanychivorus* mites were recorded in crops brinjal (12.40), okra (09.60) and crop brinjal (09.20), okra (11.10), respectively. The population of predatory mites, recorded in the summer months in all crops varied from 2.00 to 8.00. Minimum incidence of predatory mites *A. indicus* was recorded in the month of March 1st fortnight in both crops and both mites i.e. brinjal (0.20) and okra (1.20). Similar trend was observed to *A. tertanychivorus* in crop brinjal (0.90) and okra (1.40), respectively.

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KEY WORDS: *Amblyseius indicus*, *Amblyseius tertanychivorus*, Predatory mite,

Introduction

The mites of family Phytoseiidae have great importance in biological control and have promising effect in regulating the phytophagous mites, if used judiciously as bio-control agents. Bio-agents are generally considered safer to the environment for controlling the pest. Biological control of pests aims at suppression of insect pests of crops or other harmful organisms by using their natural enemies (parasites, predators or pathogens) which form part of the biotic environment¹. Most of the predatory plant mites occur in the field throughout the year. In rainy season predatory mites population builds up. Temperature, humidity, wind velocity, dust fall and light are the important factors influencing the dynamism of predatory mites.

Keeping in view, the aforesaid facts and the vital gaps in our knowledge, the present studies have been made on the seasonal incidence of two predatory mites *Amblyseius indicus* and *Amblyseius tertanychivorus* in relation with abiotic factors.

Materials and Methods

Seasonal incidence of two predatory mite species, viz., *Amblyseius indicus* and *Amblyseius tertanychivorus* under the agro-climatic condition in Jaunpur were found to prey on phytophagous mites and were associated with vegetable crops during the survey have been studied

throughout the summer seasons under the farmer field condition. The studies were carried out during March 1st fortnight to July 2nd fortnight in 2014 at surrounding fields of T. D. Collage, Jaunpur, Uttar Pradesh on two summer vegetable crops, viz. brinjal and okra. Based on the records of five-months fortnightly observations were made on the predatory mites population and seasonal incidence of these mites in the field. The populations of predatory mites were observed on whole leaf surface. For recording the predatory mite population 5 plants of each host were selected randomly and 2 leaves were plucked randomly from each of these 5 plants, twice a month. All the leaves were mixed and labeled and were brought to the laboratory for counting the mites. Care was taken not to disturb the natural population of mites on the leaf. All the mites were counted under a stereo binocular microscope. Whole population was recorded on the basis of per leaf. The weather records were collected from the meteorological section, District Agriculture Office, Jaunpur, Uttar Pradesh.

To investigate the effect of abiotic factor on the population of mite in this region, the observations recorded at fortnightly interval were used to compute the simple correlation coefficient (r) values of dependent (mite population) and various independent variables (abiotic factors, i.e., temperature, relative humidity and rainfall).

TABLE- 1 : Influence of mean temperature, relative humidity and rainfall on predatory mites *Amblyseius indicus* and *Amblyseius tetranychivorus* on brinjal and okra crops during 2014 at Jaunpur

Months	Fortnight	**Mean No. of mites population						Temperature (°C)			Relative humidity (%)			Rain fall Total (mm)
		<i>Amblyseius indicus</i>		<i>A. tetranychivorus</i>		Max.	Min.	Mean	Max.	Min.	Mean			
		Brinjal	Okra	Brinjal	Okra									
March	I	0.20	1.20	0.90	1.40	27.75	14.45	21.10	82.50	50.00	66.25	0.50		
	II	1.00	2.10	0.80	1.30	33.40	18.65	26.03	65.00	38.50	51.75	0.00		
April	I	1.60	2.30	1.90	2.40	36.15	19.35	27.75	46.00	20.50	33.25	0.00		
	II	3.90	3.50	2.10	2.30	38.15	22.00	30.08	46.00	21.50	33.75	0.00		
May	I	4.80	7.00	5.40	5.80	39.90	25.45	32.68	51.50	22.00	36.75	8.30		
	II	3.10	3.60	3.00	2.90	39.05	24.00	31.53	48.00	24.00	36.00	12.70		
June	I	2.00	2.10	1.90	3.00	40.50	28.40	34.45	63.00	33.00	48.00	5.40		
	II	7.20	5.20	6.20	7.30	38.25	28.10	33.18	72.50	43.00	57.75	55.70		
July	I	10.00	6.20	9.00	9.20	38.00	27.10	32.55	74.00	45.00	59.50	41.25		
	II	12.40	9.60	9.20	11.10	37.20	26.40	31.80	78.00	43.50	60.75	75.50		
Correlation between mites population V/S													Regression coefficient between mites population V/S	
Mean temperature		0.5390	0.5170	0.5169	0.5181	0.568		0.380	0.480	0.528				
Mean relative humidity		0.3631	0.2052	0.3874	0.4241	0.123		0.048	0.116	-0.077				
Total rain fall		0.9236*	0.8239*	0.9172*	0.9361*	0.144		0.089	0.126	0.067				
Multiple correlation		0.3631	0.2052	0.3873	0.4240									

** Mean of ten leaves randomly.

* Significant at 5% label.

The multiple regression coefficient (R) and multiple correlation coefficient of mite population in relation to abiotic factor were also computed. The correlation and regression analyses were done with the help of computer at Department of Entomology, T. D. Collage, Jaunpur, Uttar Pradesh.

Results and Discussion

The populations of predatory mites were observed on whole leaf surface. It is evident from Table-1 that the mites population started increasing from March and reached its peak during April and July months. Maximum population of *Amblyseius indicus* and *A. tetranychivorus* mites were recorded in the month of July 2nd fortnight in crops brinjal (12.40), okra (09.60) and crop brinjal (09.20), okra (11.10), respectively. The population of predatory mites were recorded in the summer month in all crops vary from 2.00 to 8.00. Minimum incidence of predatory mites *A. indicus* was recorded in the month of March 1st fortnight in both crops and both mites *i.e.* brinjal (0.20) and okra (1.20). Similar trend observed to *A. tetranychivorus* in crop brinjal (0.90) and okra (1.40), respectively.

To measure the effect of abiotic factors, *viz.* mean temperature, mean relative humidity and total rainfall on the population of predatory mites during 2014, simple and multiple correlation coefficients were analyzed and presented in Table-1. It is evident from Table 1 that positive

non-significant relation exists among temperature, relative humidity and mites population of brinjal and okra crops. Positive significant correlation showed of brinjal and okra crops in mite *Amblyseius indicus* with total rainfall. Multiple correlations exist to brinjal and okra crops is non-significant effect. It is also evident from Table-1 that there is positive nonsignificant correlation exists between temperature and relative humidity with *Amblyseius tetranychivorus* mites population on brinjal and okra crops. A significant positive relationship was obtained between total amount of rainfall and population of mites on brinjal and okra crops. Multiple correlations exist between brinjal and okra crops which are non-significant. So, temperature, relative humidity and rainfall are favourable for increasing of mites population but high temperature has direct effect of predatory mites population. Seasonal occurrence of *Amblyseius delhensis* was studied⁶ which found the population began to increase in September and reaches its peak in November. The population of *Aceria litchii* (the prey) greatly influenced the population of eight predatory mites *viz.* *Agistemus* sp., *Amblyseius largoensis*, *A. syzgjii*, *A. herbicolus*, *Typhlodromus sonprogensis*, *T. homalic*, *Tydeus* sp. and *Eupodes* sp.⁵ Workers² investigated the occurrence of phytoseiid mites on fruit trees and the biology and seasonal occurrence of *Euseius concordis*, an effective predator of *Tetranychus neocaledonicus*^{2,3}.

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