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## Population dynamics of thrips of mung bean (*Vigna radiata* (L.) Wilczek) during summer 2018

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### Abstract

The investigation was carried out at Research Farm of Birsa Agricultural University Kanke, Ranchi during summer 2018. The mean population of thrips were commenced from third week after sowing and reached to its peak 18.0 thrips/5 plant during 8<sup>th</sup> week after sowing *i.e.* 19<sup>th</sup> standard meteorological week of May, 2018. Thereafter it declined gradually when maximum temperature (39.0 °C), minimum temperature (22.7 °C), relative humidity maximum (84.7%) and minimum (40.9%) and rainfall (5.3mm) were recorded. The thrips population were recorded maximum during flowering to pod filling stage of mung bean. The correlation study indicated that the correlation between thrips population and temperature (maximum and minimum) were exhibited positively significant and non-significantly negatively correlated with maximum relative humidity and also non-significantly correlated with minimum relative humidity. When rainfall was taken in to consideration then population of thrips non-significantly correlated with rainfall.

**Keywords:** Population dynamics, thrips, mung bean, *Vigna radiata*

### Introduction

Mung bean or green gram (*Vigna radiata* L. wilczek) is the third most important pulse crop after chickpea and red gram in India<sup>[9]</sup>. The native of mung bean is believed to be India and central Asia. It is under cultivation since prehistoric time in India. It is commonly known as moong, mung, mungo, golden gram and green gram<sup>[1]</sup>. Mung beans are a healthful source of protein, fibres and rich in vitamins and minerals. It is an important legume crop that fixes the atmospheric nitrogen which enhances the soil fertility<sup>[2]</sup>. After chickpea, mung bean is also known as poor people diet due to its protein nature and is filling the major protein requirement of the people<sup>[8]</sup>. Mung bean cultivation is spreaded over various countries, especially in tropical and subtropical region of Asia. The important mung bean growing countries in the world are India, China, Philippines, Burma, Bangladesh and Pakistan. Though India has the largest producer of pulses in the world, but the average productivity is low because of the biotic and abiotic stresses. The present investigation undertaken to study their effects of weather parameters like temperature (°C), relative humidity (%) and rainfall (mm), influenced the infestation and stabilization of thrips in mung bean. Therefore, attempts were made to find out the relationships between thrips population and the abiotic factors, thus immensely helpful in formulating the management strategy against them.

### Materials and Methods

In order to study the population dynamics of thrips an important insect pest of mung bean in relation to abiotic factors, the experimental plot survey was conducted at the research farm of Birsa Agricultural University Kanke, Ranchi (Jharkhand) during summer crop season 2018. The genotype SML 668 of mung bean was grown as test variety which was sown in plot size 10 × 10 m, keeping 30 cm × 10 cm spacing between row to row and plant to plant during third week of March. The experiment was replicated thrice in a randomized block design (RBD). All the other agronomical practices were adopted as per the scientific recommendation. Weekly meteorological data were collected from agro-meteorological observatory of the university. The crop was sown on 20<sup>th</sup> March 2018 and kept free from insecticide spray throughout the cropping season. The observations on population of thrips were recorded from trifoliolate / three leaves on five randomly selected plants at weekly interval during morning hours between 6:00 AM to 8:00 AM and correlated with meteorological / weather parameters. The number of thrips per five plants counted during vegetative stage and per 10 flowers during flowering stage of crop.

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The selected plants were shaken on white sheets and total thrips were counted. Further mean population of thrips was worked out.

## Results and Discussion

Thrips are minute to small (0.5-14 mm), slender, dark to brown coloured with fringed wings, large compound eyes, 6-10 segmented antennae and unique asymmetrical mouth parts modified for rasping and sucking type. There are three major species of thrips causing damage to mung bean and other legumes crop in Asia. Both larvae and adults are causing damage on flowers and other vegetative parts of mung bean. These are phytophagous in nature they feed on flowers, sap and young plant tissue on the newest emerged leaves. Severely it causes yield loss due to flowers drop off and non-pods formation.

The data pertaining to the mean number of thrips per trifoliolate leaf during vegetative stage of plant and per 10 flowers during flowering stage has been summarized with meteorological data exhibited in Table-1. The maximum number of thrips (18) recorded in 19<sup>th</sup> standard meteorological week followed by 15.3 and 14.7 in standard meteorological week (SMW) 18<sup>th</sup> and 17<sup>th</sup> respectively. The mean thrips population reach its peak of 18.0 numbers during standard meteorological week number 19<sup>th</sup> when temperature (maximum and minimum), relative humidity (maximum and minimum) and rainfall were recorded 39°C, 22.7°C, 84.7%, and 40.9% and 5.3 mm respectively. The correlation co-efficient between weather variables and thrips population presented in Table 1.

Population of thrips were showed significantly positive correlation with maximum temperature and non-significantly negative correlation with maximum relative humidity and also showed non-significantly correlation with minimum relative humidity. When the rainfall was taken in to consideration the population of thrips correlated non-significantly with rainfall. The thrips population were recorded maximum during flowering to pod filling stage of mung bean.

These results were in agreement with the findings of [6, 5, 4] who observed significantly positive correlation with temperature (maximum) and sunshine hours which are responsible for the growth of thrips population. Likewise [10, 3, 7] reported that thrips population is more in flowering and pod filling stages.

## Conclusion

The abiotic factors viz., temperature (°C), relative humidity (%) and rainfall (mm) were affected the fluctuation in infestation of thrips population on mung bean. In correlation studies the average number of thrips/5 plant was significantly positively correlated with maximum and minimum temperature, while the other weather variables did not correlated significantly.

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**Table 1:** Population dynamics of insect pest on mung bean during summer, 2018

Date of observation	WAS	SMW	Thrips/5 plant	Meteorological parameters				
				Temperature (°C)		Relative humidity (%)		Rainfall
				Max.	Min.	Max.	Min.	(mm)
20-03-2018	1	12	0.0	31.7	16.2	85.7	33.7	0.0
27-03-2018	2	13	0.0	34.2	15.7	84.9	36.3	0.0
03-04-2018	3	14	3.7	29.1	14.1	85.6	36.0	8.5
10-04-2018	4	15	5.3	29.2	15.5	86.3	37.7	18.6
17-04-2018	5	16	13.6	35.2	19.7	84.1	35.4	0.0
24-04-2018	6	17	14.7	37.4	21.1	85.4	39.0	0.0
01-05-2018	7	18	15.3	33.9	20.2	85.0	41.4	17.4
08-05-2018	8	19	18.0	39	22.7	84.7	40.9	5.3
15-05-2018	9	20	13.6	37.6	22.9	84.4	39.7	0.0
22-05-2018	10	21	12.3	39	22.7	85.6	45.0	4.3
29-05-2018	11	22	6.3	35.3	21.6	86.9	36.9	59.6
05-06-2018	12	23	2.0	35.7	21.8	86.0	58.4	32.4
Correlation co-efficient with mean thrips population (r)				0.579*	0.673*	-0.414 <sup>NS</sup>	0.050 <sup>NS</sup>	-0.117 <sup>NS</sup>

SMW: Standard Meteorological Week

WAS: Week after Sowing

\* Indicate significance of value at P=0.05

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