SEASONAL VARIATION OF MAJOR INSECT PESTS OF MUNGBEAN IN GRID REGION, MADHYA PRADESH, INDIA

ABSTRACT

During *kharif* 2022, the experiment was conducted at RVSKVV, College of Agriculture Gwalior, Madhya Pradesh, India, to investigate the seasonal incidence of the main mung bean insect pests. Three sucking insect pests were found to be present from the vegetative stage to the maturity stage: the aphid, *Aphis craccivora*, the leafhopper, *Empoasca kerri*, and the whitefly, *Bemisia tabaci*. We observed two lepidopterans from the reproductive stage to maturity: *Spodoptera litura* and *Lampides boeticus*. We saw two lepidopterans from the reproductive stage to maturity: *Spodoptera litura* and *Lampides boeticus*. The 39th SMW had the highest prevalence of *A. craccivora* and *B. tabaci*, with populations of 1.45 aphids per plant and 7.55 whiteflies per plant, respectively. On the 40th SMW, *E. kerri's* population peaked at 4.95 adults per plant. The 38th SMW saw a high of 0.52 larvae per plant for *S. litura* and 0.21 larvae per plant for *L. boeticus*. According to correlation studies, the maximum temperature was significantly correlated negatively with *A. craccivora*, *B. tabaci*, and *L. boeticus* (r = -0.667, -0.679, and -0.680). A substantial negative connection (-0.697) was observed between *S. litura* and maximum temperature, whereas a strong positive association (r = 0.704) was seen with evening relative humidity.

Key words: Mung bean, insect pests, pulse crop, weather factors

INTRODUCTION

Mung bean (*Vigna radiata* L. Wilczek) holds significant importance in India's pulse crop sector, ranking third after chickpea and pigeon pea (Ved *et al*., 2008). Hussain *et al*., (2011) its productivity in India is 570 kg/ ha. Known for its nutritional value, mung bean serves as a crucial source of plant-based protein, particularly in vegetarian diets. Its seeds are extensively used in bread, biscuits, soups, and fresh sprouts, among other culinary preparations (Sehrawat et al., 2013). Insects are a major contributing factor to Madhya Pradesh's low mung bean productivity, while there are many other factors as well. Numerous insects have been observed on mung beans, and 64 insect pest species have been identified in India (Lal, 2008). In order to provide

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efficient, effective, and ecologically friendly pest control techniques, the current study was carried out to look at the insect pests of mung beans and their seasonal occurrence.

MATERIALS AND METHODS

Gwalior is 271 meters above mean sea level and located at latitude 26° 22' N, longitude 78° 18' E. The experiment was conducted on the "Sikha" variety, which was seeded during the 2022 kharif season at the College of Agriculture, Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya, Gwalior, Madhya Pradesh, India. With a 20 × 10 M^2 plot size and a 30 × 10 cm gap between rows and plants, all agronomic techniques were used, with the exception of pest control methods. Beginning at 15 DAS (days after sowing) and continuing until crop maturity, observations of insect pests were made from ten randomly chosen plants at weekly intervals. *Aphis craccivora* (Koch.) and *Empoasca kerri* Pruthi, sucking insect pests, were found on the top, middle, and bottom of three compound leaves. The cage method was used to record the population of *Bemisia tabaci* (Genn.). By counting the number of larvae per plant, the lepidopterans *Spodoptera litura* (F.) and *Lampides boeticus* L. were identified on ten randomly chosen plants. Weather indicators, including maximum and minimum temperature (°C), rainfall (mm), and relative humidity (%), were linked to the prevalence of these pests. For those that had a major influence, regression equations were created (Snedecor and Cochran, 1967).

RESULTS AND DISCUSSION

According to research by Sahoo and Patnaik (1994), Nath (1994), Singh and Kalra (1995), and Dar et al. (2002), *A. craccivora*, *B. tabaci*, and *E. kerri* were the main insects that attacked during the vegetative stage (15 DAS, or 35 SMW). These infestations continued until the 41st SMW, when they reached maturity. In accordance with previous studies by Sujayanand et al. (2021), *S. litura* and *L. boeticus* were observed during reproductive activity, which lasted till maturity. The former was observed from 36 DAS (38 - 41 SMW), while the latter was observed from 29 DAS (37 - 41 SMW). The seasonal prevalence of insect pests of mung beans was also examined by Irulandi and Balasubramanian (1999), Ebadah (2002), and Sarkar et al. (2008), Mahore et al. (2023).

During *kharif* 2022, the population dynamics of these pests were recorded and correlated with weather factors. *Aphis craccivora* appeared during 34th SMW (0.11 aphids/ plant) and remained active till maturity of the crop (0.98 aphid/ plant), with peak population of 1.45 aphids/

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plant being in 39th SMW; correlations revealed a significant negative correlation (r= -0.667) with maximum temperature, agreeing with the finding of Bairwa and Singh (2017). *Bemisia tabaci* appeared during 34th SMW (1.42 whiteflies/ plant) and remained active till maturity of the crop (5.30 whiteflies/ plant), with peak of 7.55 whiteflies/ plant being in 39th SMW. Chandra *et al.* (2021) The observation is in correlation with that of *B. tabaci*; a significant negative correlation (r = -0.679) was observed with the maximum temperature which agrees with those of Tamang *et al.* (2017). *E. kerri* appeared on 34th SMW (0.61 adult/ plant), continued till 42th SMW with peak (4.95 adult/ plant) attained on 40th SMW. *A. craccivora* and *Bemisia tabaci* appeared on the 34th SMW, continued till 42th SMW, with a peak (7.55 whiteflies/ plant) on the 39th SMW; correlation revealed a significant negative correlation (r= -0.679) with maximum temperature. *S. litura* appeared on the 34th SMW (0.09 larvae/ plant), continued till 42th SMW, with peak (0.52 larvae/ plant) on the 38th SMW, its incidence showed a significant negative correlation (r= -0.697) with maximum temperature, and a significant positive one (r= 0.704) was with evening RH. *Lampides boeticus* appeared on the 37th SMW, continued till 42th SMW with peak (0.34 larvae/ plant) on the 39th SMW and had a significant negative correlation (r= -0.680) was observed with maximum temperature (Table: 1& 2).

Table 1. Seasonal activity of insect pests of mung bean- Gwalior (*kharif*, 2022).

Date	**SMW**	**Sucking Insect (Nymph & Adult /plant)**			**Lepidopteran insect pest (larvae/plant)**	
		Aphis craccivora	***Bemisia tabaci***	***Empoasca kerri***	***Spodoptera litura***	***Lampides boeticus***
20-26 August	34	0.11	1.42	0.61	0.09	0.00
27-2 September	35	0.25	1.01	0.71	0.00	0.00
3-9 September	36	0.40	1.85	1.64	0.00	0.00
10-16 September	37	1.25	5.80	2.34	0.39	0.16
17-23 September	38	1.39	6.98	3.60	0.52	0.21
24- 30 September	39	1.45	7.55	3.84	0.27	0.34
1-7 October	40	0.50	4.10	4.95	0.11	0.10
8-14 October	41	1.40	6.80	2.30	0.30	0.29
15-21 October	42	0.98	5.30	1.38	0.02	0.14

SMW= Standard Metrological Week

Table 2. Correlation coefficients- incidence of insect pest vs. weather factors

Weather Factors	*Aphis craccivora* r	*Bemisia tabaci* r	*Empoasca kerri* r	*Spodaptera lithura* r	*Lampides boeticus* r

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Temp. Max. (^{0}C)	-0.667*	-0.679*	-0.147NS	-0.697*	-0.680*
Temp. Min. (^{0}C)	-0.340NS	-0.423NS	-0.024NS	0.077NS	-0.360NS
Rainfall (mm)	0.043NS	0.039NS	-0.253NS	0.387NS	0.075NS
RH Morning. (%)	0.290NS	0.276NS	0.073NS	0.602NS	0.164NS
RH Evening (%)	0.229NS	0.213NS	0.013NS	0.704*	0.146NS

r = Correlation, NS-Non significant

CONCLUSION

The study reveals that major insects *A. craccivora*, *B. tabaci*, and *E. kerri* attack Mung bean crops during the vegetative stage (15 DAS), while *S. litura* and *L. boeticus* remain active until maturity, correlated with weather factors during *Kharif* 2022.

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