Population dynamics of legume pod borer *Maruca vitrata* (Geyer) and blue butterfly *Lampides boeticus* L. on short duration pigeon pea

Anil Kumar Pandey, Ram Keval, and Amit Yadav

Department of Entomology and Agricultural Zoology, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi - 221 005, India

*E-mail:* amitento21@gmail.com

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**Abstract:** Pigeonpea (*Cajanus cajan*) is an important crop in semi-arid tropical and sub-tropical farming systems, providing high quality vegetable protein, animal feed, and firewood. Insect pests feeding on flowers, pods, and seeds are the most important biotic constraint affecting pigeon pea yields. Seasonal dynamics of insect pests in pigeon pea during kharif 2010-11 revealed that activity of legume pod borer *Maruca vitrata* commenced from 44th standard meteorological week (SMW) and continued until 50th SMW. The Peak population was noticed twice in 46th and 48th standard week with 0.30 and 0.30 larva/plant respectively. Blue butterfly, *Lampides boeticus* incidence was found to attain its peak from 47th to 49th standard week with peak population of 0.20 larva/plant. Such study helps in development of suitable management strategy as well as helps in timely forecasting of pest incidence.

**Key Words:** Pigeonpea, Legume pod borer, Blue butterfly

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**Introduction**

The pulses being rich source of proteins with high nutritional value occupy a special role in diet of human beings. Pulses contain nearly 30 per cent protein that supplements the energy rich cereal diet. Among the pulses, pigeonpea consisting of 20-21 per cent protein occupies an important place next to chickpea and is widely grown in semi-arid tropical regions of the world. Pigeon pea, *Cajanus cajan* (L.) Millsp. is an important pulse crop of in India. The pigeon pea production in recent years is not able to meet the requirements of growing population necessitating the losses and constraints to be curbed. More than 200 species of insects have been found feeding on pigeon- pea, although only a few of these cause significant and consistent damage to the crop (Lateef and Reed 1990). The pod borers have been identified as the major constraints in increasing the productivity of pigeon pea (Sahoo and Senapati, 2002). Among the constituents of the pod borer community infesting pigeon pea, the legume pod borer, *Maruca vitrata* (Geyer) (Lepidoptera : Crambidae) is one of the most serious pests occurring during flowering and pod formation stage causing huge losses. Legume pod borer, *Maruca vitrata* (F.) has now become a major pest of short duration pigeon pea both in North and Central India (Ali and Gupta, 2012). In India, *Maruca* damage has been found to range from 9 to 51 % in pigeon pea (Bhagwat et al., 1998). Spotted pod borer damages tender leaf axils, flower buds, flowers, and pods by webbing and boring clusters of flowers or pods during cooler parts of the year on about 39 hosts. Short duration, determinate pigeon peas and cowpeas with compact clusters are more susceptible. Ganapathy (2012) reported in cowpea 25-40% damage and 9-84% in pigeon pea across the globe. Effective management strategies have to be developed to reduce the losses caused by the pest. Understanding the biology of the pest and the population dynamics in the crop will yield valuable information for strategizing the management options of that particular pest. Blue butterfly causes the considerable damage to buds, flowers and tender pods. This insect is active from last week of November to first week of March on pigeon pea. The eggs are laid singly or in groups of 2 to 3 on flower buds, green pods and occasionally on shoots and leaves. Incubation period lasts for 4 to 7 days. The newly hatched larva develops with in flower buds and green pods, and pupates after 9 to 27 days. The pupation takes place on the leaf twigs or on the pods. The pupal period lasts for 7 to 19 days. The larvae chew leaves, buds, flowers and pods. Small holes are seen in damaged pods. Blue butterfly, *Lampides boeticus* L. significantly reduces the crop yield to an extent of 60 to 90% (Durairaj 2006). Hence, the present investigation has been carried out to study the population dynamics of legume pod borer and blue butterfly fly in pigeon pea under field conditions.

**Materials and Methods**

With the view to study the population dynamics of legume pod borer and blue butterfly a field experiment was conducted in randomized block design with three replicates at Agricultural Research Farm, Banaras Hindu University, Varanasi, during kharif 2010-11. UPAS-120 commonly cultivated in this area was raised as per recommended agronomic practices. The meteorological data was recorded during the ensuing period. Five plants randomly selected from each replication were tagged for observing mature and immature stages of both legume pod borer and blue butterfly. The population was recorded from first week of October 2010 at weekly interval. The data thus obtained were subjected to statistical analysis for drawing conclusion.
Results and Discussion

Incidence pattern of legume pod borer: The first incidence of *Maruca vitrata* larvae was observed in the 44 standard weeks. The larvae were found from 44 to 50 standard weeks. There were two peaks in the larval population. The first peak was recorded in 46 (0.30 larvae plant⁻¹) and the second peak in 48 standard week (0.30 larvae plant⁻¹) (Fig. 1). Similar type of result was found by Sujithra and Chander (2014) during kharif 2011, the incidence of *M. vitrata* commenced from 36th SMW and increased gradually and attained a peak of (17.7 larvae plant⁻¹) during 39th SMW. This declined with increase in crop age reaching almost nil by 44th SMW. During kharif 2012, the activity of *M. vitrata* population was noticed during 36th standard week that reached to maximum (8 larvae/plant) during 39th SMW. Similar pattern of activity of *M. vitrata* was observed by Chetan et al. (2013) and Sonune et al. (2010). Srivastava and Joshi (2011) also reported that the high humidity and moderate temperature during September – October proved congenial.

Incidence pattern of blue butterfly: The first incidence of blue butterfly *Lampides boeticus* Larvae was commenced from 42 standard week of the year 2010. The larval population of blue butterfly was found from 42 to 50 standard weeks. The peak larval population was recorded from 47 to 49 standard weeks (0.20 larvae plant⁻¹) (Fig. 2), after that the population of blue butterfly was decreased till the crop harvested. The present finding are in accordance with Shantibala et al. (2004) reported that the peak population was attained during the first week of January 2000 (10.86 and 13.61% on flowers and buds and pods, respectively) and last week of December 2000 (10.31 and 16.46% on flowers and buds and pods. Study resulted that the seasonal impact of legume pod borer *Maruca vitrata* on short duration pigeon pea was very high and it emerge as a major pest of short duration pigeon pea. Population of blue butterfly was low as compared to legume pod borer but both affected the yield of pigeon pea and use of suitable control measures are recommended to overcome the population of legume pod borer and blue butterfly and its management.

References


