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Research Article

FIRST REPORT OF BEAN POD BORER MOTH (*MARUCA VITRATA* FABRICIUS, 1787) FROM RAJASTHAN, INDIA

[1]Anil Kumar Tripathi, [2*]Anil Kumar Sharma, [3]Ashvini Kumar Joshi and [4]Narayan Lal Choudhary

[1,3]Department of Zoology, M.L.V. Government College Bhilwara, Rajasthan
[*2]Department of Zoology, Dr. BRA Govt PG College, Nimbahera, Rajasthan
[4]Department of Zoology, Adarsh Mahavidhyalaya, Jodhpur, Rajasthan

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ABSTRACT

Bean pod borer moth (*Maruca vitrata* Fabricius, 1787) belongs to the subfamily Pyraustinae, family Crambidae, super family Pyraloidea, and order Lepidoptera. Species morphological characteristics by wingspan range between 13 to 25 mm with a dark brown body, while females are typically heavier than males. Species predominantly feed on different leguminous crops such as pigeon pea, cowpea, mung bean and soybean. This species has been previously reported in different state and regions of India including Sikkim, Goa, Tamil Nadu, Meghalaya, Maharashtra, Nagaland, Arunachal Pradesh, West Bengal, Himachal Pradesh, Uttarakhand, Tripura, Karnataka, Madhya Pradesh, Assam, Gujarat, Mizoram, Andhra Pradesh, Telangana, Delhi, Kerala, Chhattisgarh and Chandigarh. However, present observation provides first photographic record and evidence of the species present in Rajasthan State, India.

Keywords: Bean pod borer moth, *Maruca vitrata*, Crambidae, Leguminous crop, Rajasthan.

INTRODUCTION

Moths belong to order Lepidoptera and arthropod phylum, and play a crucial role in terrestrial ecosystems by providing numerous ecosystem services, such as pollinating agents for flowers, herbivores of crops and wild plants, as well as serving as a food resource for several bird and mammal species, such as bats (Regier *et al.,* 2009; Bates *et al.,* 2014). Several moth species have been identified as nocturnal plant-feeding insects, most of which are associated with angiosperm plants that largely depend upon animals for pollination (Wahlberg *et al.,* 2013).

Moths are ectothermic species that exhibit a wide range of distributions among different habitats and are recognized as indicator species for ecosystem health and status. Therefore, changes and patterns of diversity, distribution and abundance in particular areas can be used as ecological indicators for the conservation of biodiversity and ecosystem health in particular areas (Dennis *et al.,* 2019). Moreover, several studies have indicated that moth diversity has declined at the global level over the past few decades (van Lanevelde *et al.,* 2018; Hallmann *et al.,* 2020; Dar and Jamal, 2021). This decline is associated with habitat loss, fragmentation, degradation, expansion of urbanization, artificial lighting at night, agricultural intensification and climate related factord (Conard *et al.,* 2004; Dennis *et al.,* 2019; Bell *et al.,* 2020). In Rajasthan, only limited studies have been conducted on the distribution, abundance, and diversity of moth-particular Southern Rajasthan (Koli and Prajapati, 2021), Jaipur (Savita and Trigunayat, 2023), Jhalawar (Jain and Verma, 2023), and the urban areas of the Bhilwara district (Tripathi *et al*., 2025 a & b). However, the bean pod borer moth species has not been reported from Rajasthan state. So present study provided new record species *Maruca vitrata* Fabricius, 1787 (Lepidoptera: Pyraloidea: Crambidae: Pyraustinae) from Bhilwara district, Rajasthan.

MATERIALS AND METHODS

During regular visits to the Bhilwara city area, the Bean pod borer moth (*Maruca vitrata* Fabricius, 1787) moth

*Corresponding Author: Anil Kumar Sharma, Department of Zoology, Dr. BRA Govt PG College, Nimbahera, Rajasthan Email: anilkumarsharma031995@gmail.com.

species was sighted from the campus area of MLV College Bhilwara. Photographs of the observed species and their habitats photographs were taken using Nikon P500 cameras. Species identification has done using "Moths of India" and "iNaturalist" online databases.

RESULT AND DISCUSSION

Bean pod borer moth is also known as a legume borer moth. During literature survey, it was found that the species was previously observed and distributed in Asia, Africa, North, South, and Central America, Caribbean, Europe, Australia and Oceania (Taylor, 1967; Raheja, 1974; Katayama and Suzuki, 1984; Ke *et al.,* 1985; Sharma, 1998; Lu *et al.,* 2007; Periasamy *et al.,* 2015; Ba *et al.,* 2019). In India, it has been reported in different regions of county, including Sikkim, Goa, Tamil Nadu, Meghalaya, Maharashtra, Nagaland, Arunachal Pradesh, West Bengal, Himachal Pradesh, Uttarakhand, Tripura, Karnataka, Madhya Pradesh, Assam, Gujarat, Mizoram, Andhra Pradesh, Telangana, Delhi, Kerala, Chhattisgarh, and Chandigarh (Table 1) (Sondhi *et al.,* 2025). Therefore, the present paper reports this species first time occurrence from Rajasthan, India. On 24.05.2025, we first observed of this species in Rajasthan from campus of Manikya Lal Verma Government College, Bhilwara (Figure 1). Adult moth characterized by large sized wingspan ranges between 13 to 25 mm with dark brown body colour. Generally female are heavier than male individuals. Larva of this species is tub-shaped, translucent and colour ranges from greenish to brown with dark brown spot on each segment. Eggs are oval and greenish-white, turning yellow as they mature (Taylor, 1967). This moth species predominantly feed on leguminous crops like pigeon pea, cowpea, mung bean and soybean.

Table 1. First reporting of *Maruca vitrata* Fabricius, 1787 in India.

(Source: http://www.mothsofindia.org)

S.No.	State	Date of Reporting	Observers
1.	Sikkim	22.10.2008	Shyam Ghate
2.	Goa	27.09.2009	Shyam Ghate
3.	Tamil Nadu	14.12.2010	Vikas Madhav Nagarajan
4.	Meghalaya	27.01.2011	Sanjay Sondhi
5.	Maharashtra	26.11.2011	Janathan Dsilva
6.	Nagaland	10.04.2012	Joyce Veino
7.	Arunachal Pradesh	12.04.2012	Purnendu Roy
8.	West Bengal	24.06.2014	Asim Mitra
9.	Himachal Pradesh	21.09.2015	Sanjay Sondhi
10.	Uttarakhand	22.10.2015	Sanjay Sondhi
11.	Tripura	04.12.2015	Suman Bhowmik
12.	Karnataka	20.11.2017	Gopakumar VR Namboothiri
13.	Madhya Pradesh	26.10.2018	Samrat Godambe
14.	Assam	06.12.2018	Kumud Ghosh
15.	Gujarat	22.09.2019	Rajesh Prabhakar Mahajan
16.	Mizoram	04.12.2019	Priya Singh
17.	Andhra Pradesh	28.12.2019	R. Bhanumathi
18.	Telangana	24.07.2020	Sirisha Kusuma
19.	Delhi	23.08.2020	Sourabh
20.	Kerala	26.04.2021	Arun Lal
21.	Chhattisgarh	25.10.2021	Gulshan Kumar
22.	Chandigarh	08.08.2022	Rajesh Prabhakar Mahajan

Figure 1. Bean pod borer moth, *Maruca vitrata* Fabricius, 1787 reported from Bhilwara, Rajasthan, India.

Furthermore, larval stages of *Maruca vitrata* are destructive to the forest and agricultural ecosystems, as they consume the flower and pods of more than 39 host plants, including two non-leguminous species (Rathore and Lal, 1998; Arodokoun *et al.,* 2003). Taylor (1978) and Singh and Jackai (1988) provided information on the biology and management of *Maruca vitrata*. Larvae of *Maruca vitrata* consume flower buds and pods by webbing them together. These feeding habits protect larvae from predators and other adverse factors, including insecticides. They are usually laid on eggs during the flower bud stage. Larvae migrate from one flower to another, with each larva consuming four to six flowers before completing their development. Third to fifth instar larvae are capable of boring pods and occasionally into peduncles and stems (Taylor, 1967).

CONCLUSION

The present study documents the first record of the bean pod borer moth, *Maruca vitrata* (Fabricius), from Rajasthan, India. The occurrence of this species in Bhilwara expands its known distribution within the country, where it has already been reported from several states across diverse agro-climatic zones. Morphological characteristics of adults, larvae, and eggs observed in the present study are consistent with previous descriptions. As a polyphagous pest with a wide geographical range, *M. vitrata* continues to pose a serious threat to leguminous crops and associated ecosystems due to its destructive larval feeding behavior on flowers and pods.

The confirmation of its presence in Rajasthan highlights the need for regular monitoring, early detection, and the development of integrated pest management strategies to minimize crop losses. This first report thus provides baseline information for future ecological, biological, and management studies of *M. vitrata* in the region.

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CONFLICT OF INTERESTS

The authors declare no conflict of interest

ETHICS APPROVAL

Not applicable

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AI TOOL DECLARATION

The authors declares that no AI and related tools are used to write the scientific content of this manuscript.

DATA AVAILABILITY

Data will be available on request

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