

Diversity of Insect Fauna in Brinjal Ecosystem

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Abstract—A preliminary study was conducted during 2015-2016 on the abundance and diversity of insect species found in brinjal ecosystem at Experimental Farm, Department of Horticulture, Assam Agricultural University, Jorhat, Assam. They were collected by sweeping nets and hand picking from December 2015 to April 2016. The present study was aimed to determine relative abundance of insect fauna collected from brinjal ecosystem. A total of seven insect species under 3 different orders and 6 families were recorded. This study revealed that among all insect species found in brinjal *Aphis gossypii* was most dominant with their relative abundance 36.04% followed by *Myzus persicae* (17.04%), *Bemisia tabaci* (13.49%), *Leucinodes orbonalis* (17.97%), *Amrasca biguttula biguttula* (2.52%), *Henosepilachna vigintioctopunctata* (1.03%) and *Monolepta signata* (1.03%).

Keywords: Brinjal, *Aphis gossypii*, relative abundance

1. INTRODUCTION

Brinjal also known as eggplant or aubergine (*Solanum melongena* L.), is a solanaceous crop grown throughout the world. The brinjal fruits are the richest source of potassium, magnesium, calcium and iron (Zenia and Halina, 2008). In India, it was grown in an area of 6.63 lakh ha with a total production of 125.15 lakh MT (Horticulture Division, D/O Agriculture & Cooperation, M/O Agriculture, 2016). In Assam, the crop was cultivated with an area of 17,300 ha and a total production of 2.86 lakh tonne during 2014-2015 (Horticulture Statistics Division, Department of Agriculture, Cooperation and Farmers welfare, GOI). Brinjal crops are attacked by several insect pests that cause severe damage which renders the fruit unfit for human consumption (Singh and Arbol, 2001). *Aphis gossypii* Glov. has a worldwide distribution and is a major economically important pest of brinjal. As a consequence of its feeding activity, the aphid causes leaves to curl up, damaging seriously the vegetation and fruits. Through their feeding, they transmit viral diseases like mosaic caused by Potato virus Y (Singh *et al.*, 2014). Other than aphids, the major constraints for lower production of brinjal are the attack of fruit and shoot borer (*Leucinodes orbonalis* Guenee), stem borer (*Euzophera perticella* Ragonot), epilachna beetle (*Henosepilachna vigintioctopunctata* Fab.), leafhopper (*Amrasca biguttula biguttula* Ishida). White fly

(*Bemisia tabaci* Gennadius) and leaf roller (*Antoba olivacea* Walker).

2. MATERIALS AND METHODS

Study Area

The study area is located at situated at 26°47' latitude and 94°12'E longitude at an altitude of 86.6 m above mean sea level. Climatologically, the climate of this region is characterized by subtropical humid having dry and cool winter. Monsoon season normally starts from June and extends upto September and the intensity of rainfall decreases from October. Mean annual rainfall is more than 2000 mm per annum and average humidity is around 85 per cent. The temperature gradually increases from March and reaches maximum during August. The soil of Jorhat is mostly alluvial and sandy loam with pH ranging from 4.8 to 5.5.

Methodology

The present study was carried out from December 2015 to April 2016 in Horticultural Orchard of Assam Agricultural University by following methods:

Sweep net:

Sweep sampling was done from the herb and shrub layers of the vegetation using a sweep net. This method is specially suited for sampling insects from ground layer vegetation. The sweeps were done during the morning hours. The insects collected in the sweeping were temporarily transferred in polythene bags and plastic bottles. Later, they are taken to the laboratory and killed using chloroform. These insects were stretched, pinned and preserved.

Hand collection:

Insects were directly collected by hand and transferred in killing bottles. The insects were processed for pinning and preserved in wooden insect box in dry condition.

3. RESULTS AND DISCUSSION

During the investigation, a total number of seven insect species under 3 different orders and 6 families were recorded was associated with brinjal crop ecosystem. These were *A. gossypii* Glover, *M. persicae* Sulzer, *L. orbonalis* Guenee, *E. perticella* Ragonot, *H. vigintioctopunctata* Fab., *A. biguttula biguttula* Ishida, *B. tabaci* Gennadius, *A. olivacea* Walker. Among all insect species found in brinjal, *A. gossypii* was most dominant with their relative abundance 36.04% followed by *M. persicae* (17.04%), *B. tabaci* (13.49%), *L. orbonalis* (17.97%), *A. biguttula biguttula* (2.52%), *H. vigintioctopunctata* (1.03%) and *M. signata* (1.03%). From the observation it was found that incidence of *A. gossypii* was comparatively more abundant than *M. persicae*. Borah (1994); Kalita (1996) and Kalita *et al.* (1997) reported that the most commonly found aphids of brinjal in Assam was *A. gossypii*, while Borah (2013) reported that incidence of *A. gossypii* in brinjal was more common than *M. persicae* which was in conformity with present findings.

The time and duration of occurrence of insects and predators varied. *A. gossypii* was first observed on 2nd week of January and remained throughout the season. *M. persicae* occurred on February and March. *B. tabaci* appeared on 2nd week of January and persisted till April. Shoot infestation by *L. orbonalis* observed from 4th week of January. Fruit infestation started from 1st week of March and continued upto the harvest. *A. biguttula biguttula* appeared from 1st week of January to April. *H. vigintioctopunctata* started appearing from 3rd week of January and remained active till harvest. *M. signata* was found to be observed from 1st week of February till April.

All the insect pests presently recorded in the field were also observed previously by different workers from India as pests of brinjal crop (Mote, 1978); Mall *et al.* (1992) and Chandrakumar *et al.* (2008). The present findings was more similar with the findings of Borah (2013) where she reported the heavy incidence of coleopteran pest *H. vigintioctopunctata* and *M. signata* and lepidopteran pest *L. orbonalis* in brinjal crop.

A number of insect pests of brinjal were reported from Assam by various workers (Haque, 1974; Isahaque, 1979; Deka and Saharia, 1981; Borah, 1990; Shaw, 1990; Borah, 1994; Kalita, 1996 and Kalita *et al.*, 1997) which included *A. biguttula biguttula*, *H. vigintioctopunctata*, *Aplosomyx scutellatus*, *D. flavocincta*, *M. signata*, *Altica cyanea*, *Psylloides bretteghami*, *Tanymecus indicus*, *Agrotis ipsilon*, *L. orbonalis*, *A. (Eublema) olivacea*, *P. bipunctalis*, *A. gossypii*, *Tetranychus neocaledonicus*.

Gangwar and Singh (2014) also recorded the incidence of total eight species of insect associated with brinjal crop at different crop growth stages. The first attack on the crop appeared one week after transplantation and continued till crop harvested. Insect pests those were found attacking the crop were jassids (*A. biguttula biguttula*), aphids (*A. gossypii*), whitefly (*B.*

tabaci), leaf roller (*E. olivacea*), shoot and fruit borer (*L. orbonalis*), epilachna beetle (*E. vigintioctopunctata*), leaf webber (*P. bipunctalis*) and grass hopper (*Chrotogonus spp.*).

Sathe *et al.* (2016) also reported the incidence of twelve species of insect pests attacking brinjal crop viz., *L. orbonalis* Guen., *E. perticella* Rag., *E. vigintioctopunctata* Fab., *U. sentis* Diast., *A. biguttula biguttula* Dist., *B. tabaci* Genn., *Aleurodicus dispursus* Rus., *L. erysimi* Kalt., *A. destructor* Sign., *A. auranti* Maskell, *T. palmi* Karny and ants have been recorded damaging brinjal crop.

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