

**PREVAILING INSECTS AND MITE PESTS OF BRINJAL AND THEIR  
NATURAL ENEMIES AT JASHORE IN BANGLADESH**

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Brinjal (*Solanum melongena* L.) is one of the important vegetable crops grown in all parts of Bangladesh. It has a positive role in both summer and winter to fulfill the market demand of vegetables in Bangladesh. It contains high content of vitamins, minerals and bioactive compounds those are remunerative to human health. In this respect, brinjal is ranked among the top 10 vegetables in terms of oxygen radical absorbance capacity (Cao *et al.* 1996). Asia has the largest eggplant production, which comprises more than 90% of the world production area and 87% of the world production (Choudhary and Gaur 2009). One of the major constraints to the successful brinjal production in Bangladesh is the damage caused by insect and mite pests. Studies reveal that 20-30% of the total brinjal production is lost directly or indirectly by the attack of insect and mite pests every year (Dutta *et al.*, 2017; Amin *et al.* 2018). In order to develop economically feasible, ecologically sound and socially acceptable pest management strategies, detail information of a pest complex, the status and the sequence of appearance of the pest during the crop period, the losses and type of damages of the crop are of great importance (Bijur and Verma, 1995). In Bangladesh insect pests of brinjal and their damage severity and natural enemies in different location of this country are insufficient. Therefore, the present study was undertaken to record the insect pest complex of brinjal with natural enemies, pest status, nature of damages, and the time of appearance of the pests in relation to the phenology of the crop.

The research was conducted in the Regional Agricultural Research Station (RARS), Jashore, during November 2018 to April 2019 (rabi season). The brinjal variety Jashore local (Chega) was used. Seeds were sown in seedbed on 20th October 2018. The total area of the experimental field was 30m X 20m (600m<sup>2</sup>) consisting of 21 plots. Each plot was 5 m length and 3 m breadth. The spacing was 1.0m X 0.75m. The land was fertilized with cow dung, urea, TSP, MoP and gypsum @ 10000, 550, 450, 250 and 111 kg/ha, respectively. Healthy and uniform brinjal seedlings were transplanted in the experimental plots on 20th November, 2018. Irrigation, weeding and other intercultural operations were done when necessary. But no insecticide or plant protection measures were used during the study.

Observations on the population of different insect pests were recorded from seedling to maturity stages of the crop. Data on different species of insects were recorded from randomly selected 10 plants in each plot. The shoot infestation was judged by counting healthy and infested shoot from 10 randomly selected plants per plot. Similarly, fruit infestation was recorded by counting the number of total healthy fruits and damaged fruits. Number of damaged leaves/five plants

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were observed to record data for sucking pests were counted on six leaves (each from 2 upper, middle and lower leaves per plant) by examining each leaf carefully during early morning hours, when the pest was less active. Mite population was counted by hand lens and magnifying glass. Natural enemies were also counted following similar method carefully. Relative population of insect was counted. The insects were identified following Nayar *et al.* (1995) and Biswas *et al.* (1998). The insect were graded as major and minor on the basis of their population density per plant, feeding behavior, nature and extent of crop damage.

Ten species of insect pests belonging to 4 orders and 9 families were found to infest at different growth stages of brinjal during the study. Among the recorded insects, only three (3) namely, Brinjal shoot and fruit borer (*Leucinodes orbonalis*), epilachna beetle (*Epilachna dodecastigma*), and jassid (*Amrasca biguttula biguttula*), were considered as the major pests. Four species of natural enemies namely coccinellid beetles, *Coccinella septempunctata*, *Coccinella transversalis*, *Menochilus sexmaculatus* and spider, *Argiope luzona* were recorded from the brinjal crop (Table 1).

The population density per plant of major and minor insects and their feeding behavior on brinjal crop is presented in table 2. Among the pests, 6 insect species were grouped as sap sucker, one as fruit borer, two as leaf eater and one as leaf roller. The population density per plant of major insects namely, brinjal shoot and fruit borer, epilachna beetle and jassid was 5.75, 7.65 and 22.55, respectively. Similarly, the population density per plant of the minor insects namely, aphid, whitefly, mealy bug, green leafhopper, leaf roller, leaf beetle and mite was 18.35, 35.45, 45.25, 35.45 3.25, 9.45 and 48.75, respectively. Population density perplant of natural enemies namely, *C. septempunctatam*, *C. transversalis*, *M. sexmaculatus* and *A. luzona* was 4.96, 4.24, 5.85 and 4.45, respectively (Table 2.). Four species of natural enemies were found in the experimental field, Jashore. They were found to prey different insect pests

Brinjal shoot and fruit borer, epilachna beetle, aphid, mealy bug, leaf roller were found to infest the brinjal crop at the vegetative stage and continued their infestation during maturity stage. The other insects namely, jassid, whitefly, green leafhopper, leaf beetle were noticed from seedling to maturity stage of the crop. Mite *Tetranychus* sp. was present in the crop at the flowering to maturity stages. The natural enemies, coccinellid beetles present at the late vegetative stage and continued their predation up to maturity stage of the crop. Spider was recorded from the brinjal crop at late vegetative stage to stages of the crop.

In Bangladesh, the insect pests of brinjal were recorded by several scientists. Ali *et al.* (2012), Latif *et al.* (2009), Rashid *et al.* (2013) recorded five (5) major insect pests found in brinjal crop viz. brinjal shoot and fruit borer (BSFB), aphid, white fly, jassid and thrips which were also recorded in the present observation. Latif *et al.* (2009) recorded 12 species of insect pests attacking brinjal crop in

Bangladesh which were also included in the present study. Amin *et al.* (2018) recorded 8 species of natural enemies in brinjal in BSMRAU, Gazipur. which were recorded in the present observation.

The appearances and succession of the insect pests on brinjal crop showed that different pest species occurred in an overlapping manner and the crop was under the continuous attack of one or more pests. Most of the major and minor pests appeared in the crop during the vegetative, flowering and fruiting stages and the maximum infestation occurred during flowering and fruiting stages of the crop. The research results gives information on the insect pests of brinjal crop over the previous reports in Bangladesh.

**Table 1. Insect and mite pests and their natural enemies of brinjal during November 2018 to April 2019 in the experimental field of the Regional Agricultural Research Station, Jashore**

Name of the insect	Scientific name	Family	Order	Status
Brinjal shoot and fruit borer	<i>Leucinodes orbonalis</i> (Guen.)	Pyalidae	Lepidoptera	Major
Whitefly	<i>Bemisia tabaci</i> (Genn.)	Aleyrodidae	Hemiptera	Minor
Epilachna beetle	<i>Epilachna dodecastigma</i> (Wied.)	Coccinellidae	Coleoptera	Major
Aphid	<i>Aphis gossypii</i> (Glover)	Aphidae	Hemiptera	Minor
Jassid	<i>Amrasca biguttula biguttula</i> (Ishida)	Cicadellidae	Hemiptera	Major
Mealy bug	<i>Centroccoccus insolious</i> (Green)	Pseudococcidae	Hemiptera	Minor
Green leaf hopper	<i>Nephotettix virescens</i>	Cicadellidae	Hemiptera	Minor
Leaf roller	<i>Antoba olevacea</i>	Noctuidae	Lepidoptera	Minor
Leaf beetle	<i>Monolepta signata</i> Oliv.	Chrysomelidae	Coleoptera	Minor
Mite	<i>Tetranychus</i> sp.	Tetranychidae	Acarina	Minor
Lady bird beetle	<i>Coccinela septempunctata</i>	Coccinellidae	Coleoptera	Predator
Lady bird beetle	<i>Coccinela transversalis</i>	Coccinellidae	Coleoptera	Predator
Lady bird beetle	<i>Menochilus sexmaculatus</i>	Coccinellidae	Coleoptera	Predator
Spider	<i>Argiope luzona</i>	Argiopidae	Acarina	Predator

**Table 2. Population density (number per plant) and prevalence of different insect and mite pests and their natural enemies of brinjal in the Regional Agricultural Research Station, Jashore.**

Name of insect	Sc. Name	Population/ plant/leaf	Nature of damage	Prevalence of the pests
Brinjal shoot and fruit borer	<i>L. orbonalis</i>	5.75	Shoot and fruit borer	V-Fr
Whitefly	<i>B. tabaci</i>	22.55	Sap sucker	S-Fr
Epilachna beetle	<i>E. dodecastigma</i>	7.65	Leaf eater	V-Fr
Aphid	<i>A. gossypii</i>	18.35	Sap sucker	V-Fr
Jassid	<i>A. biguttula biguttula</i>	35.45	Sap sucker	S-Fr
Mealy bug	<i>C. insolious</i>	45.25	Sap sucker	V-Fr
Green leaf hopper	<i>N. virescens</i>	35.45	Sap sucker	S-Fr
Leaf roller	<i>A. olevacea</i>	3.25	leaf roller	V-Fr
Leaf beetle	<i>M. signata</i>	9.45	leaf eater	V-Fr
Mite	<i>Tetranychus</i> sp.	48.75	Sap sucker	F-Fr
Lady bird beetle	<i>C. septempunctata</i>	4.96	Predation	V-Fr
Lady bird beetle	<i>C. transversalis</i>	4.24	Predation	V-Fr
Lady bird beetle	<i>M. sexmaculatus</i>	5.85	Predation	V-Fr
Spider	<i>Argiope luzona</i>	4.45	Predation	V-Fr

S= Seedling Stage, V= Vegetative Stage, F=Flowering Stage, Fr= Fruiting Stage

### References

- Ali, M., M., Ashfaq, W., Akram, S.T. Sahi, and A. Ali. 2012. The physio-morphic characters of the brinjal (*Solanum melongena* L.) plant and their relationship with the jassid (*Amrasca biguttula biguttula* (Ishida)) population fluctuation. *Pakistan J. Agric. Sci.* **49**(1): 67-71.
- Amin, M.R., M.S. Miah, H. Rahnan, N.P. Nancy and M.K.A. Bhuiyan. 2018. Functional and group abundance of insects on eggplant at *Bangladesh J. Agril. Res.* **43**(4): 647-653.
- Bijur, S. and S. Verma. 1995. Sequential appearance of insect pests and natural enemy complex of on Pea crop. *Indian J. Ent.* **57**(4): 373-377.
- Biswas, G.C., M.Y., Mian, M.C., Shaha, A. Ahmed, and S. Islam. 1998. Brinjal shoot and fruit borer infestation and damage estimation of fruits of four brinjal varieties in Khagrachari of Bangladesh. *Bangladesh J. Agril. Res.* **23**(1): 15-23.
- Cao, G., E. Sofic, and R.L. Prior. 1996. Antioxidant capacity of tea and common vegetables. *J. Agric. Food Chem.* **44**: 3426-3431.

Choudhary, B. and K. Gaur. 2009. The development and regulation of Bt brinjal in India (Eggplant/Aubergine). International Service for the Acquisition of Agri-biotech Applications (ISAAA) Brief No. 38. ISAAA, Ithaca, NY, USA. Pp. 15.

Dutta, N.K., S.N. Alam, M.Nahmudunnabi, M.R.Amin and Y.J.Kwon. 2017. Effect of insecticides on population reduction of sucking insects and lady bird beetle in eggplant field. *Bangladesh J. Agril. Res.* **42**(1): 35-42.

Latif, M. A., M.M., Rahman, M.R. Islam, and M.M. Nuruddin. 2009. Survey of arthropod biodiversity in the Brinjal field. *Bangladesh J. Entomol.* **6**(1): 28-34.

Nayar, K.K., T.N.A. Krishnan, and B.V. David. 1995. General and Applied Entomology. (11th edn.). Tata McGraw- Hill pub. Co. Ltd. 4/12, New Delhi- 110002. Pp. 557.

Rashid, M.H., M.J., Khatun, M.S., Mahfuz, C.K. Dash, and M.A. Hussain. 2013 Seasonal fluctuation of insect pests of brinjal at Agricultural Research Station, Burirhat, Rangpur. *Int. J. Expt. Agric.* **3**(1): 4-8.