

SHORT COMMUNICATION

Observation trial on *Mythimna separata* Walker a new destructive sugarcane pest in north-west region of Bangladesh and its Management**M.N.A. Siddiquee*, M.A. Rahman, M.S. Islam, M.E. Reza, T. Ahmed and M. Begum**

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The sugarcane defoliators or Leaf Eating Caterpillar or army-worm, *Mythimna separata* Walker (Noctuidae: Lepidoptera) is considered to be a sporadic pest which occasionally causes serious losses to sugarcane crop. The insect polyphagous, infesting a wide variety of crops, rarely assuming epidemic proportions on sugarcane. The army-worm, *Mythimna separata* Walker (Noctuidae: Lepidoptera) was first reported to be a pest of sugarcane in Bombay (Wagle, 1951) and later in Bihar (Butani, 1955). Beside sugarcane, it does havoc in paddy, wheat, maize and other monocotyledonous plant (Tripathi *et al.*, 1982). Thus, it seems that the *Mythimna separata* Walker has been recorded for the first time in North Bengal Sugar mills farm and Bangladesh Sugarcrop Research Institute experimental farm, Ishurdi which are located in north-west region of Bangladesh in cropping season of 2015-16. The larvae were found to infest the expanding leaves of the cane by chewing the leaf lamina either partially or completely, leaving only the midrib. They take shelter beneath the leaf-sheath or dry trash during the day and feed voraciously during night. When the larvae are in swarms the damage is widespread and the defoliation is very severe (Wagle, 1951; Purohit *et al.*, 1963). The crop, however, recovers subsequently when new leaves emerge. Army-worm generally damages severely in the field where trash is left unburnt, especially during the early stages (April to June) of crop, where the central whorl is more vulnerable to attack (Atarsingh *et al.*, 1978).

The larvae were collected in Biotechnology research plot and reared in the Entomology Division laboratory, BSRI. The adults emerged were identified as *Mythimna separata* Walker (Noctuidae: Lepidoptera). The morphology of this pest has been described; Eggs are laid in row or clusters either between the overlapping leaf-sheaths or soil, mostly at night. Each egg mass consists of 20-76 eggs.

Egg: The egg is (Figure 1) shiny white or light brown in color when fresh and gradually turns pale yellow and finally black. The egg stage lasts for 8-11 days.

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Larva: The larvae have four clear longitudinal stripes on either side of the mid-dorsal line of the body (Figure 1). They are nocturnal and hide in the soil, under trash, stubbles, leaf-sheaths or leaf whorls during the day. They are negatively photo tactic (Avasthy and chaudhary, 1965). Duration of larval stage is 12-17 days.

Pupa: Pupation takes place under dry leaves, stubbles litters and also in the leaf whorls (Figure 1). Duration of pupal stage is 7-12 days.

Adults: The adult (Figure 1) is a medium sized, stout built, pale brown moth measuring about 15-20mm in length and 30-40 mm in wing expanse. The moths are nocturnal and hide under the vegetation during day time. Adult lives 3-5 days.

The field experiment was conducted at the North Bengal Sugar mills (NBSM) farm, Natore during the cropping season of 2015-16. The experiment was comprised of four treatments including one untreated control viz., T_0 - control (untreated), T_1 : Nitro 505 EC @ 2.5 L ha⁻¹ (May + June) applied at 15 days interval, T_2 : Nitro 505 EC @ 3.0 L ha⁻¹ (May + June) applied at 15 days interval and T_3 : Nitro 505 EC @ 4.0 L ha⁻¹ (May + June) applied at 15 days interval (Table 1). The plot size was 6m x 5m and plot to plot distance was 2 meter. The variety Isd 37 was used as planting material (sett) and planting was done through conventional sett placement end to end method in the trenches in December 2015. Another observational trial was set at the experimental farm of Biotechnology division at BSRI, Ishurdi in the cropping season of 2015-16. The setts were transplanted in February 2016. Fertilizers were applied as per recommended dose, method and time (FRG, 2012). Intercultural operations were done as and when required (Rahman and Pal, 2003). Data were taken two times, first in May and finally in June. Percent infestation by *Mythimna separata* was by counting total and infested canes for individual plot by using the following formula and analyzed statistically with the help of Statistic-10 program with LSD test at 5% level of significance (Gomez and Gomez, 1984).

$$\% \text{ Infestation} = \frac{\text{Number of infested canes}}{\text{Total number of canes in individual plot}} \times 100$$

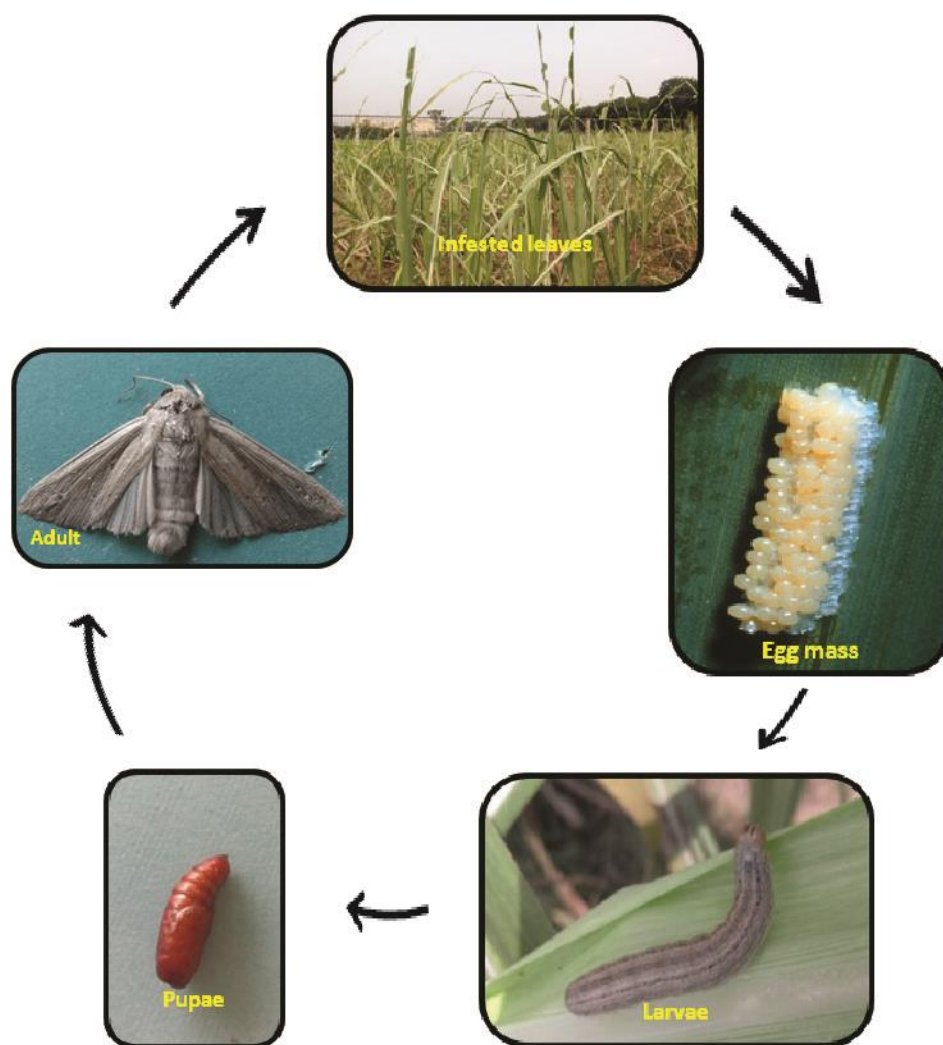


Figure 1. Life cycle of Sugarcane leaf eating caterpillar, *Mythimna separata* Walker in entomology divisional laboratory, BSRI, 2015-16

Table 1. Effect of Nitro 505 EC (Chlorpyrifos and Cypermethrin) in controlling *Mythimna separata* caterpillar at NBSM experimental farm, Natore, 2015-16

Treatments	% leaf infestation (Mean)		Pooled Data	% Efficacy
	May'16	Jun'16		
T ₁ : Nitro 505 EC @ 2.5 L ha ⁻¹ (May + June) applied at 15 days interval	13.61b	1.95b	7.78	75.63
T ₂ : Nitro 505 EC @ 3.0 L ha ⁻¹ (May + June) applied at 15 days interval	9.15c	1.06b	5.11	84.00
T ₃ : Nitro 505 EC @ 3.5 L ha ⁻¹ (May + June) applied at 15 days interval	9.12c	1.05b	5.09	84.06
T ₀ - control (untreated)	55.70a	8.15a	31.93	-
LSD (0.05)	4.3701	1.5655	-	

Means followed by uncommon letters are statistically different from each other at 5% level of probability by DMRT

Table 1 revealed that the highest rate infestation (31.93%) by *M. separata* was observed in untreated control plot which was significantly higher than any other Nitro 505 EC treated plots at NBSM experimental farm. The highest efficacy of (84.06%) over control was observed in Nitro 505 EC @ 3.5 L ha⁻¹ treated plot followed by Nitro 505 EC @ 3.0 L ha⁻¹ (84.00%) treated plot whereas Nitro 505 EC @ 2.5 L ha⁻¹ provided 75.63%. Nitro 505 EC @ 3.0 L ha⁻¹ and 3.5 L ha⁻¹ provided the desired level of 80% efficacy over control. These two doses of Nitro 505 EC could fulfill the desired requirement of Pesticide Technical Advisory Committee, 1980.

Table 2. Effect of Nitro 505 EC (Chlorpyrifos and Cypermethrin) in controlling *Mythimna separata* caterpillar at BSRI experimental farm, Ishurdi, 2015-16

Treatments	% leaf infestation (Mean)		Pooled Data	% Efficacy
	May'16	Jun'16		
T ₁ : Nitro 505 EC @ 2.5 L ha ⁻¹ (May + June) applied at 15 days interval	13.79b	17.40b	15.60	74.32
T ₂ : Nitro 505 EC @ 3.0 L ha ⁻¹ (May + June) applied at 15 days interval	9.92c	11.45bc	10.69	82.40
T ₃ : Nitro 505 EC @ 3.5 L ha ⁻¹ (May + June) applied at 15 days interval	7.89c	9.40c	8.65	85.76
T ₀ - control (untreated)	55.44a	66.04a	60.74	-
LSD (0.05)	3.8692	6.2159	-	

Means followed by uncommon letters are statistically different from each other at 5% level of probability by DMRT

From the observation trial at BSRI farm, the highest efficacy of (85.76%) over control was observed in Nitro 505 EC @ 3.5 L ha⁻¹ treated plot followed by Nitro 505 EC @ 3.0 L ha⁻¹ (82.40%) treated plot (Table 2).

- Based upon the present findings following conclusion can be made for the control of *Mythimna separata* particularly sugarcane leaf eating caterpillar thereby securing the cane production for the pest prone areas.
- Application of Nitro 505 EC (Chlorpyrifos and cypermethrin) @ 3.0 L ha⁻¹ applied in May + June were found effective in controlling leaf eating caterpillar in commercial cultivation of sugarcane in the country. Further study would be needed for the management of the pest before recommending this insecticide with appropriate dose for the sugarcane growers.

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