*Journal of Crop and Weed, **8**(2):146-147(2012)*

Effect of bio-pesticides on the egg parasitoid (*Telenomus* sp.) of yellow stem borer in transplanted rice

A. SASMAL, D. K. BHATACHARYA, L. R. NANDA AND U. S. NAYAK

Department of Agricultural Entomology, College of Horticulture,
Orissa University of Agriculture and Technology, Chiplima, Sambalpur, Orissa, India

Received:24-06-2011, Revised: 14-10-2012 Accepted:25-10-2012

***Key words*:** *Bt*, multineem**,** neem seed extract, neem oil, yellow stem borer

Since mid-sixties, misuse and over use of synthetic pesticides in crop husbandry system have resulted with many negative consequences like insecticide resistance, insect resurgence and minor pest assuming the major pest status, environmental pollution, ecological imbalance and decline in population of biocontrol agents. In the present investigation an attempt has been made to formulate an ecofriendly management schedule against major insect pests of transplanted rice by integrating neem derivatives, *Bt* formulations and synthetic pesticides, chlorpyriphos to conserve the biocontrol agents in rice ecosystem. An experiment was conducted at the Regional Research and Technology Transfer Station (RRTTS), Keonjhar, Orissa University of Agriculture and Technology. The experiments were designed in a Randomized Complete Block Design (Factorial). A rice variety moderately resistant to insect pests *Lalat* and a susceptible one *Jaya* were included in the test. There were ten treatments in the experiment. Three neem formulations *viz*., neem seed extract (NSE-5%), neem oil (NO-5%) and Multineem (0.3%) were applied either alone or in alteration with chlorpyriphos (400 g a.i. ha^{-1}). The *Bt* formulation (Halt @ 1000 g a.i. ha^{-1}) was also included in the experiment. Laboratory studies were made to determine the degree of parasitization of yellow stem borer, *Scirpophaga incertulus* by *Telenomus* sp.

As per Jhansilashmi *et al*. (1997) egg masses of yellow stem borer (2 to 5 number) were collected from each treatment depending upon their availability during 3 seasons. Each egg mass was kept in individual homoeopathic vial. After 7-10 days, the number of parasites emerged out from the parasitized egg mass were recorded. The stem borer egg parasitization by egg parasite, *Telenomus* sp. (Hymenoptera: Scelionidae) was studied in the laboratory. This parasite was identified by the taxonomic characters as described by Reissig *et al*. (1986). Yellow stem borer egg parasitoid, *Telenomus* sp has 11-12 segmented antenna, pointed abdomen and thin 3rd abdominal segment. Then the egg was kept in 10% KOH solution for 5 – 10 minutes to dissolve the furs covering the egg mass. The egg mass was then placed under microscope to estimate the number of eggs per egg mass and the number of [illegible]. The extent of parasitization of eggs was computed by using the following formula:

Yellow stem borer egg parasitization (%) =

$$\frac{\text{Number of eggs parasitized}}{\text{Total number of eggs in an egg mass}} \times 100$$

The percentage of egg parasitization of yellow stem borer, *Scirpophaga incertulus* by *Telenomus sp* was observed in the laboratory condition from the egg mass collected from the field of different treatment plots over three seasons. Percentage parasitized eggs was found to be relatively more in the plots where neem pesticides like neem seed extract (5%), neem oil (5%) and Multineem (0.3%) were applied at 20 and 40 DAT or neem seed extract (5%) at 20 DAT plus *Bt* formulation (Halt @ 1000g.ha^{-1}) at 40 DAT or *Bt* formulation at 20 DAT plus chlorpyriphos at 40 DAT recorded 10 to 20% parasitization as against 20 to 24% parasitization in untreated check plots as well as 10 to 14.33% parasitization in the plots in receipt of recommended IPM practice plots. Three treatments comprising neem based pesticides at 20 DAT plus chlorpyriphos 400 g a.i. ha^{1}) at 40 DAT recorded 10% to 14% parasitization. It is inferred that repeated use of neem pesticide at 20 and 40 DAT or integration of neem based pesticides and Bt formulation (Halt) as separate application proved to be safer to the parasite, *Telenomus sp* Jhansilaxmi *et al.* (1997); Manisegaran *et al*. (1998); Kareem *et al.* (1999); Makendaya and Dibakar (1999) found out that neem derivatives were relatively safer to the rice yellow stem borer egg parasite *Telenomus* sp. The results obtained from the present investigation indicated the relatively safer properties of neem based pesticides like neem seed extract (5%), neem oil (5%) and Multineem (0.3%) against the yellow stem borer egg parasite *Telenomus* sp. The present findings corroborated to the views offered by the above scientists. Thus, from the above discussion it can be concluded that the repeated use of neem pesticides at 20 and 40 DAT or integration of neem based pesticides and *Bt* formulation as separate application proved safer. So to maintain the perfect balance in rice ecosystem the neem derivatives can be included in pest management schedule either as sole application at 20 40 and 70 DAT or in combination with one intermediate application of synthetic pesticide at 40 DAT.

Short Communication

Email: asasmal_ento@ovi.com

Table 1: Percentage of egg parasitization of yellow stem borer by *Telenomus* spp. (Nixon) in different treatments during *Kharif* and *Rabi* season at 50 days after transplanting (DAT)

Treatments	% egg parasitization of yellow stem borer at 50 DAT					
	Jaya			*Lalat*		
	***Kharif* 1**	***Rabi***	***Kharif 2***	***Kharif* 1**	***Rabi***	***Kharif* 2**
Recommended IPM Practice	10 (3.24)	14 (3.81)	10 (3.24)	11.33 (3.44)	14.33 (3.85)	13 (3.67)
NSE (5%) at 20 & 70 DAT + Chlorpyriphos (0.4kg a.i./ha) at 40 DAT	11 (3.39)	12 (3.53)	11 (3.39)	13 (3.67)	11 (3.39)	12 (3.53)
NO (5%) at 20 & 70 DAT + Chlorpyriphos (0.4kg a.i./ha) at 40 DAT	12 (3.53)	12 (3.53)	11 (3.39)	10 (3.24)	11 (3.39)	11.33 (3.44)
Multineem(0.3%) at 20 & 70 DAT + Chlorpyriphos (0.4kg a.i./ha) at 40 DAT	11 (3.39)	10 (3.24)	12 (3.53)	11.33 (3.44)	12 (3.53)	14 (3.81)
Halt (1kg/ha) at 20&70DAT + Chlorpyriphos (0.4kg a.i./ha) at 40 DAT	14 (3.81)	13 (3.68)	12 (3.54)	11 (3.39)	12 (3.53)	10 (3.24)
NSE (5%) at 20, 40 & 70 DAT	20 (4.53)	18 (4.30)	16 (4.06)	17 (4.19)	16 (4.06)	15.66 (4.02)
NO (5%) at 20, 40 &70DAT	16 (4.06)	15 (3.93)	14.66 (3.89)	14 (3.80)	12 (3.53)	11 (3.39)
Multineem(0.3%) at 20, 40 & 70 DAT	14 (3.81)	15 (3.93)	14 (3.81)	15 (3.93)	14 (3.80)	13 (3.67)
NSE (5%) at 20 & 70 DAT + Halt (1kg/ha) at 40 DAT	15 (3.93)	14 (3.81)	13 (3.67)	12 (3.530	15 (3.93)	13 (3.67)
Untreated Control	24 (4.95)	22 (4.74)	20 (4.53)	23 (4.85)	21 (4.64)	22 (4.74)
SEm(±)	**0.05**	**0.02**	**0.16**	**0.05**	**0.16**	**0.02**
LSD(0.01)	**0.15**	**0.46**	**0.06**	**0.15**	**0.46**	**0.06**

Note: Figures in the parentheses are the transformed values

REFERENCES

Jhansilashmi, V., Katti, G., and Krishnaiah, N. V. and Lingaiah, T. 1997. Laboratory evaluation of commercial neem formulations vis-à-vis insecticides against ehgg parasitoid, *Trichogramma japonicum* Ashmead (Hymenotera: Trichogrammatidae). *J. Biol. Control*, **11** : 33-36.

Kareem, A. A., Gunasekaran, K., Anbalagon, G. and Ragupathy, A. 1999. Safety of new neem formulations against natural enemies of Agro ecosystems. *Neem Newsletter*, **16** : 32-33.

Manisegaran, S., Letchoumanane, S. and Mohamed Hanifa, A. 1998. Relatively safety of neem products to *Trichogramma chilonis* Ishli (Hymenoptera Braconidae). *Oryza*, **35** : 313.

Markendeya, V. and Divakar, B. J. 1999. Effect of neem formulations on four bioagents. *Pl. Prot. Bull.*, **51** : 28-29.

Reissig, W. H., Heinrichs, E. A., Litsinger, J. A., Moody, K., Fielder, L., Mew, T. W. and Barrion, A. T. 1986. Parasites of rice stem borers. *In. Illustrated guide to Integrated Pest management in rice in tropical Asia*. International Rice Research Institute, Phillipines, pp. 358-60.