FTFNIPM Trip Report

Country and Places Visited: Bangladesh – Dhaka, and Gazipur (Bangladesh Agriculture Research Institute (BARI) and Ispahani Agro Ltd.)

Name of the traveler and her designation: Binu Bhat, Technical officer (Entomologist)

Period of Travel: 21-07-2022 to 28-07-2022

Purpose of Travel: Training on mass rearing of different parasitoids and their field application as a component of IPM

Description of Activities:

Besides Lecture class we took practical classes. We prepared the diet for host insects like *Corcyra cephalonica* and *Sitotroga cerealella* for egg parasitoid mass production.

Mass rearing of *Sitotroga cerealella* on wheat required 5 kg wheat poured into boiled water for 2-3 minutes. Then the placed in steel trays (50 cm x 60 cm), each tray containing 2.5 kg and one gm of *S. cerealella* eggs. It was kept for 5-6 days in untouched condition. After that, required amount of water was added to maintain moisture. After 22-25 days later, the infested wheat with *S. cerealella* larvae, was kept in mass rearing chamber for adult emergence. From mass rearing chamber thousands of *S. cerealella* adults were collected and kept in a glass cylinder then the eggs laid on the wall of the cylinder were brushed and sieved to collect fresh eggs. The adults, their body parts, and scales were cleaned by holding the cylinder near an exhaust fan to get the fresh eggs. Five grams fresh eggs of *S. cerealella* were placed in a long moist cylinder and the eggs were spread over the cylinder. Vial containing one gram parasitized eggs with *Trichogramma* were then kept inside the glass cylinders. Within 9-12 days parasitism of almost all eggs of *S. cereallela* has taken place. After emergence, adult parasitoids were released in the eggplant field in micro plot and in open field conditions. Also, tricho-cards were prepared and clipped to plants in the same fields at BARI, Gazipur.

Mass rearing of *Corcyra cephalonica,* a host of *Trichogramma.* Diet containing chickpea flour, and wheat flour was used for rearing *Corcyra.* The mixture was kept in the plastic vessels and *Corcyra* eggs were spread over the surface and covered with black cloth. for 12 days. After emergence of adults, they were collected and placed in a plastic jar. Plastic jar base was removed and net was used to cover so that egg laid collected collected easily. The collected eggs mixed with damaged parts of adult insects and scales were separated using sieve near an exhaust fan. The eggs were glued on the hard paper. The nucleus card is placed along with daughter cards in the test tube and left for parasitization. The tricho cards in pupal stage of the parasitoid were hung in the field or parasitoids were released in the field after their emergence.

Mass rearing of larval parasitoid, *Habrobracon hebetor.* Mass rearing of *H. hebetor* was done at IPM laboratory, Entomology division, BARI. *Habrobracon hebetor* is a larval parasitoid. Female *Habrobracon* stings and paralyzes host larvae and then lays eggs on them. Fifth and sixth instar wax moth, *Gallerai mellonella* larvae was used as the host of *H. hebetor*. At first a parent stock of

wax moth was developed on honeycombs placed in glass jars. First to second instar larvae of wax moth were released in the artificial diet made of definite proportions of wheat flour, maize flour, milk, animal fat, sugar, and yeast and autoclaved at 125ºC and 1.5 PSI for 70 minutes. The larvae when attained full growth length in 18-20 days, they were transferred into a plastic bottle containing 200 larvae/bottle with a corrugated paper sheet. The full fed larvae took position on the corrugated paper sheet for pupation. Then 40 adults *H. hebetor* were released in the plastic bottle with 10% honey solution for their food. The open end of the jar was closed with black cloth. The wax moth larvae and *H. hebetor* were kept in a rack for 8-10 days for parasitism. longevity of the adult parasitoids in the laboratory was 20-25 days with feeding.

We visited the pesticide analytical lab of entomology division which was well equipped for pesticide toxicology research and residue analysis. We observed different equipments like GC-MS, LC-MS, etc. Analysis of pesticide was based on using GC-ECD. Analyses of extracts of different vegetables and fruits collected from the market were conducted using GC-MS and LC-MS to identify and to know the level of pesticides in them. It was good to know that the number of samples containing pesticides level is showing a decreasing trend in recent years.

We visited Ispahani Agro Limited, Konabari, Gazipur. Its head-quarters is in Chittagong and it was founded in1820. Its produces tea, seeds, textiles, jute, food fproducts, bio pesticides, lures, biocontrol agents etc. Bio control agents like larval parasitoid *habrobracon hebetor* were reared in large scale to fulfill the demand for pest management. Parasitoid were reared in late instar wax moth larvae. Adult of *H.hebetor* were packed in plastic jar and sold. Biological insecticide fawligen for control of *S. frugiperda* in maize was packed in small sachet and were marketed. Rubber septa lure impregnated with pheromones were also prepared in the laboratory. BSFB – lure, Fall Army-lure, Spodo –Lure Plus, Tuta lure, Exigua –Lure, Fall Army-Lure Plus, YSB – Lure, fruit fly –lure etc. were prepared in the laboratory.

Participation in meetings/lectures/visits:

Topic	Presenter	No. of participants
Biorational based Integrated Pest management- An overview	Dr. Syed Nural Alam	10
Biological control of insects pest and mass rearing protocol development and field release techniques	Dr. Syed Nural Alam	10
Strengthening bio-control by transboundary exchange of tools, techniques, and expertise amongst South Asian Countries	Dr. Rangaswamy Muniappan	10

Orientation of IPM Laboratory and briefing on the training program	Dr. Nirmal Kumar Dutta	10
Role of BARI in Agricultural development of Bangladesh: especial emphasis on pest management.	Dr. Debasish Sarkar	10
Mass Production protocols of different egg and larval parasitoids in Bangladesh: an overview	Dr. Kohinoor Begum	10
Mass rearing of the host (*Corcyra cephalonica*, *Sitotroga cerealella*) for egg parasitoid mass production	Dr. Kohinoor Begum	10
Storage of host eggs, preparation of tricho cards and different methods for *Trichogramma* mass rearing and their field release	Dr. Kohinoor Begum	10
Field release of egg parasitoid, *Trichogramma*	Dr. Nirmal Kumar Dutta	10
Preparation of artificial diet for mass production of wax moth	Dr. Kohinoor Begum	10
Mass production protocol of larval parasitoid *Habrobracon hebetor* on wax moth larvae	Dr. Nirmal Kumar Dutta	10
Fields release techniques and efficacy study larval parasitoid *Habrobracon hebetor*	Dr. A K M Ziaur Rahman	10
Bio-pesticides based management practices against major insect pests of different crops	Dr. Nirmal Kumar Dutta	10
Bio- rational based pest management technologies	Dr. Nirmal Kumar Dutta	10
Status of Bio-pesticide/ biocontrol agents use for insect pest management in Bangladesh	Dr. Nirmal Kumar Dutta	10

Recommendations/comments:

The training on mass rearing of different parasitoids and their field application as a component of IPM was very effective and fruitful. As the training was practical based, it will enhance our ability for mass rearing of both host insects and parasitoids and release in the field to reduce populations of pests.

List of people met:

Name	Designation	Email address
Dr.NiramKumar Dutta	CSO & head of Entomology	nkdutta83@yahoo.com
Dr.Syed Nurul Alam	Ex. Director, BARI & senior consultant CIMMYT	Alamsn09@gmail.com
Dr..Debasish Sarkar	Director General , BARI	
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