

FTFNIPM Trip Report

Country and Places Visited: Bangladesh, BARI, Gazipur

Name of the traveler and her designation: Saraswati Neupane, Senior Scientist

Period of Travel: 20th July 2022-28th July 2022

Purpose of Travel: To participate in international training program on “Mass rearing of different parasitoid and their field application as a component of IPM”.

Description of Activities:

The training program was started from 23rd July of 2022. In the first day session, after registration and welcome remarks, Dr. R Muniappan gave his talk on "Strengthening bio-control by transboundary exchange of technologies, techniques, and expertise among South Asian countries" in the seminar room of BARI. On the same day, three more experts gave a total of five lectures on subjects such developing mass rearing protocols, bio-rational based IPM, the availability of bio-pesticides and bio-control agents in Bangladesh, and IPM lab orientation.

The second day session (July 24, 2022) concentrated on theory and practical classes as well as mass production protocols of various egg and larval parasitoids, their storage, preparation of tricho-cards, and field release of egg parasitoid Trichogramma. In addition, the inaugural session was held in the morning, with Dr. Shaikh M. Bokhtiar, the Executive chairman of BARI, serving as the chief guest. Dr. D. Sarker chaired the inaugural session and also gave a presentation on the role of BARI in Bangladesh's agricultural growth, with a focus on pest management.

Similarly Day 3 (25th July) and Day 4 (26th July), included a number of lecture and practical classes by several experts on artificial diet preparation, mass production protocol and field release techniques of *Habrobracon hebetor* on wax moth larvae, practice of tricho-card preparation and their field release, mass production of different hosts for parasitoids, bio-control based pest management on fall army worm, review of mass rearing and field release of larval parasitoids by trainees, sight-seeing were accomplished. We visited the Ispahani Agro biotech lab in Konabari, Gazipur, on the last day of training session (July 27, 2022) and learned about the various bio-pesticides, lures, and BCAs mass production for pest management produced by Ispahani Agro Limited. Ispahani Biotech works in a variety of sectors, including vegetables, rice, maize, tea, cotton, sugarcane, tobacco, and mango, and a crop-specific pest and disease control package has been developed. The firm has already developed and started to use 9 distinct types of sex pheromone lures, 12 miticides, 5 bio-fungicides, 1 bio-bactericide, 2 bio-irradiation, 1 bio-nematicide, 2 fruit bags, 3 color sticky traps, 2 BCAs, and 2 pheromone traps in the farmers field. The issue of producing bio-products and their efficacies in big fields was always uncertain, and Ispahani, genuinely launched the difficult task and brought hope to limit the haphazard application of chemicals in the agriculture sector. The available products are listed below.

1. Sex pheromone Lure (9): (Q-Phero for *Bactrocera cucurbitae*);Bactro-D(*B.dorsalis*);BSFB-Lure(*Leucinodes orbonalis*);Spodolure (*Spodoptera litura*);Fall Army-Lure(*Spodoptera frugiperda*);Helico-Lure(*Helicoverpa armigera*);Exigua-Lure(*Spodoptera exigua*);YSB Lure(*Scirpophaga incertulas*);Tuta-Lure(*Tuta absoluta*).
2. Miticide(12):K-Mite;Biotrin;EcomecBio-insecticide:Bio-Chamak;Bio-Btk;Spodo NPV;Fawligen;Helico-NPV;Bio-Action;Bio-Clean;Bio-veria
3. Bio-fungicide (5): Bio-Shield (Different fungal disease for foliar application); Trichoderma
4. Bio-bactericide (1): Under registration process

5. Bio-irrigicide (2) under registration process
6. Bio-Nematicide (1) under registration process
7. Bio-control Agent (2) Trichogramma (egg parasitoid); Bracon (Larval parasitoid)
8. Fruit Bag (2) Mango fruit bag, Banana fruit bag
9. Color sticky trap (3) Yellow sticky trap; blue sticky trap; white sticky trap
10. Pheromone Trap (2) ibt-01; ibt-02

The training session was formally completed following the organization of a closing ceremony and certificate distribution event.

Participation in meetings/lectures/visits: (prepare a table listing the topic, presenter, and number of participants)

S.N	Topic	Presenter	No. of participant
1.	Strengthening bio-control by transboundary exchange of tools techniques and expertise amongst South Asian countries	Dr. Rangaswami Muniappaan, Chief investigator, IPMA, Virginia Tech	15
2.	Bio-rational based integrated management- An overview	Dr. Syed Nurul Alam, Ex. Director, BARI and senior consultant CIMMYT	15
3.	Biological control of insect pest and mass rearing protocol development and field release	Dr. Syed Nurul Alam, Ex. Director, BARI and senior consultant CIMMYT	15
4.	Orientation of IPM laboratory and briefing on the training program	Dr. Nirmal Kumar Dutta CSO, Ento Division , BARI	15
5.	Role of BARI in Agriculture development of Bangladesh especial emphasis on pest mgmt	Dr. Debasish Sarkar, DG, BARI	10
6.	Mass production protocols of different egg and larva 1 parasitoids in Bangladesh(Lecture)	Dr. Kohinoor Begum, Principal Scientific Officer, Entomology Division BARI	10
7.	Mass production of fictitious host (corcyra cephalonica, Sitatoga cereal for egg parasitoid mass production(Lecture + Practical)	Dr. Kohinoor Begum, Principal Scientific Officer, Entomology Division BARI	10
8.	Storage of host eggs ,preparation of trichocard and different methods of Trichogramma mass rearing	Dr. Kohinoor Begum, Principal Scientific Officer, Entomology Division BARI	10
9,	Field release of egg parasitoid Trichogramma (Lecture + Practical)	Dr. Nirmal Kumar Dutta CSO, Ento Division , BARI	10

10.	Preparation of artificial diet for mass production of wax moth(Lecture + Practical)	Dr. Kohinoor Begum, Principal Scientific Officer, Entomology Division BARI	10
11.	Mass production protocols of Larval Parasitoid Habrobracon hebetor on wax moth larva(Lecture +Practical)	Dr. Nirmal Kumar Dutta CSO, Ento Division , BARI	10
12.	Field release techniques and study of larval parasitoid Habrobracon hebetor (Lecture +Practical)	Dr.AKM Ziaur Rahman, PSO, Ento division, BARI	10
13.	Practice of trichocard preparation, wax moth rearing by artificial diet preparation and mass production of Trichogramma and Habrobracon hebetor	Dr. Kohinoor Begum, and Akhtaruzzaman Sarkar, Entomology Division, BARI	10
14.	Practical on group wise	Group A and Group B	10
15.	Visited Ispahani Agro limited Konabari, Gazipur	Group visit	15

Recommendations/comments:

The training seeks to emphasize the role of parasitoids in IPM and their application as a part of ecologically-safe pest management. The most impressive aspect of this training session is the planning of the efficient practical classes to teach the mass rearing of various parasitoids utilized in agriculture. In order to safeguard crops, most crop protection programs now rely heavily on the application of chemical pesticides, even as a preventive measure. This raises production costs, breeds new populations of insect pests that are resistant to pesticides, and makes crops reliant on this technology. Therefore, this training is practically helpful to decrease the application of chemical pesticides and enhance biological control measures in the agriculture sector of underdeveloped nations.

List of people met: (prepare a table with names of people, their designation, and email addresses)

S.N	Names	Designation	Email address
1	Dr. Rangaswami Muniappaan,	Chief investigator, IPMA, Virginia Tech	rmuni@vt.edu
2	Dr.Syed Nurul Alam,	Ex. Director, BARI and senior consultant CIMMYT)	
3	Dr. Nirmal Kumar Dutta	CSO, Ento Division , BARI	
4	Dr. Debasish Sarkar,	DG,BARI	
5	Dr.Kohinoor Begum,	Principal Scientific Officer, Entomology Division BARI	
6	Dr.AKM Ziaur Rahman,	PSO, Ento division, BARI	
7	Madhab Chandra Das	Country Program Manager Feed the Future Bangladesh integrated Pest Management Activity	<madhabcd@vt.edu>
8	Mrs. Kalpana Dhital	IDE, Officer	<kdhital@ideglobal.org>

9	Mrs. Sushma Marahatta	Plant protection officer	<sushmrta@gmail.com>
10	Mrs. Binu Bhat	Technical Officer(T6)	<binubhatchhetri@gmail.com>