

Feed the Future: Innovation Lab for Integrated Pest Management Trip Report

Country(s) Visited: Nairobi, Kenya

Dates of Travel: January 10 to June 30, 2019

Travelers' Names and Affiliations: Tarekegn Fite Duressa, ICIPE and Ambo University, Ethiopia. tfduressa@gmail.com

Purpose of Trip: For molecular laboratory work on *Helicoverpa armigera* genetic diversity and population structure study collected from various host plants and geographical locations

Sites Visited: MBBU laboratory, Dudduvile Campus, Nairobi, Kenya

Description of Activities/Observations:

Molecular laboratory work to study the genetic variability and population structure of *Helicoverpa armigera* in Ethiopia collected from various host plants and geographical locations.

Activities accomplished	Descriptions	Accomplished months					
		January 10	February	March	April	May	June
House renting	Financial facilitating from icipe and arrangement for settlement at Kasarani, Nairobi, Kenya						
Purchasing molecular markers specific for <i>Helicoverpa armigera</i>	Microsatellites, mtDNA and EPIC markers were ordered for purchase from macrogen company						
Practical laboratory working at molecular laboratory of MBBU	Reading laboratory manuals and guidelines for practical exercise at MBBU, Nairobi, Kenya						
Preparations and confirming the availability of working materials and equipment's	Arranging and collecting molecular equipment's from other laboratories of icipe						
Working solution preparation from Kit (DNA extraction Kit)	The working solutions were prepared by aliquoting and mixing of various reagents						
Preliminary DNA extraction from <i>H. armigera</i> larvae	20 larvae of <i>H. armigera</i> were randomly selected to validate the protocols and further usage of the Kit working solutions						
Gel electrophoresis running	To confirm that the availabilities of DNA ladders						
PCR amplification	DNA extraction kit was validated as the quality and quantity of amplicons (PCR products)						
DNA extraction from all of the populations (whole)	Genomic DNA of 238 working samples of <i>H. armigera</i> larvae were extracted						
Gel electrophoresis	To confirm that the availabilities of DNA						

running	ladders taking same as representatives of the populations/samples of each population						
PCR amplification	The genomic DNA was amplified using real time and Conventional PCR at MBBU molecular laboratory						
Sending the PCR products for sequencing	Both the microsatellite and mtDNA markers were used and the amplicons of each markers were sent to USA and Korea for genotypings and sequencing						
Sequence data analysis	Various molecular data analysis tools were used for both markers to generate informative results						

Training Activities Conducted:

Program type (workshop, seminar, field day, short course, etc.)	Date	Audience	Number of Participants		Training Provider (US university, host country institution, etc.)	Training Objective
			Men	Women		
Induction for MBBU molecular laboratory usage	1, Feb/2019	Mr. Gezhagn Getaneh	2	-	Icipe, MBBU laboratory	To be familiar with molecular laboratory working environments
Biostatistics (Statistical Methods and Data Analysis with R)	14-16, Feb/2019	ARPIS and DRIP students	23	14	Icipe, Dudduville Campus	To familiarize data analysis and usage in R software
Practical working on molecular techniques	10, March/2019	Mr. Gezhagn Getaneh	2	-	Icipe, MBBU laboratory	General molecular laboratory techniques
DNA extraction and PCR amplification	April 1- June, 30/2019	Mr. Gezhagn Getaneh	2	-	Icipe, MBBU laboratory	To determine the genetic variability and population structure of Ethiopian populations of H. armigera

List of Contacts Made:

Name	Title/Organization	Contact Info (address, phone, email)
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Challenges

- Delay in ordering of primers
- Overlap of activities with other project work within the laboratory
- Delay in budget transfer
- Absence of training in bioinformatics areas

Actions taken:

- Discussion with the suppliers and facilitating bodies
- Arrangement of the laboratory activities and we used all the options even by using laboratory other than MBBU
- We resolved the budget issues by discussing the importance of timely release of the required amounts
- We gained bioinformatics/data analysis software and how to use from icipe students and post-doc researchers

Lessons learned

- New techniques in molecular biology was acquired from icipe researchers
- Materials and equipment found in Africa were known for future institutional partnership
- Familiarity with multilingual and distinct Africans and other international scientists and icipe students
- Many seminars and related trainings were attended; numerous skills and knowledge gained