HOW TO APPLY

Complete application form in the prescribed format forwarded by chairperson should reach the Course Coordinator, Division of Entomology, ICAR-IARI, New Delhi on or before 5th October 2022. The application form can be downloaded from the IARI website https://www.iari.res.in **or the NAHEP-CAAST website** (https://nahep-caast.iari.res.in)**.**
Filled-in applications, neatly typeset (not handwritten) with the approval of forwarding authority should be submitted on or before **5th October 2022**. Selected candidates will be informed by mail by **15th October 2022.**

WHO CAN PARTICIPATE

M. Sc. and Ph. D. students (on roll) of ICAR-Deemed to be Universities/SAUs/CAUs/CUs/other UGC recognized Universities and Research Institutes are eligible to apply. A maximum of 25 participants will be selected for the training programme.

REGISTRATION FEES: No registration fee is to be paid; the programme is fully sponsored by NAHEP-CAAST

TRAVEL

A traveling allowance will be provided by the organizers as per the norms. Selected trainees are entitled only to Sleeper/AC III-tier tickets.
Students are expected to make their arrangements to reach the training venue at 9:30 am on all working days

FOOD and ACCOMMODATION

Food and accommodation will be provided for outside students. Tea and snacks will be served during the programme and expenditure will be met from the training budget.

IMPORTANT DATES:

DURATION: **February 07 -17, 2023**
Last Date for application**: 5th October 2022**
Intimation of selection: **15th October 2022**

Course Director

Dr. S. Subramanian
Principal Scientist,
Division of Entomology,
ICAR-IARI, Pusa Campus,
New Delhi -12
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Course Coordinators

Dr. Suresh M Nebapure
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Scientist (SS), Division of Entomology,
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Tel: 9818371904

Dr. Kumar A
Principal Scientist, Division of Plant Pathology
ICAR-IARI, New Delhi -12.
Tel. 9540829009

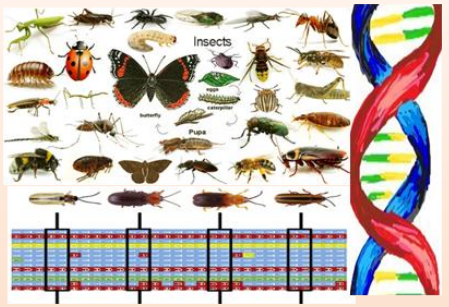
Venue:

Lectures & Practical's: Discovery Centre and Division of Entomology, ICAR-Indian Agricultural Research Institute, Pusa Campus, New Delhi-110012.

National Agricultural Higher Education Project (NAHEP)

Sponsored Training Programme on

Genomics Assisted Insect Pest Management



February 07 -17, 2023

Organized by
Center for Advanced Agricultural Science and Technology (CAAST)

ICAR-Indian Agricultural Research Institute
New Delhi- 110012

About NAHEP-CAAST

Centre for Advanced Agricultural Science and Technology (CAAST) is a new initiative andstudent-centric sub-component of **the World Bank**-sponsored **National Agricultural Higher Education Project** (NAHEP) granted to IARI to provide a platform for strengthening the educational and research activities of post-graduate and doctoral students. CAAST theme for IARI is **Genomics assisted crop improvement and resource management** that specifically aims at inculcating genomics literacy and skills among the student.

Background of the training

Genomics Tools have redefined the contours of entomological research worldwide in recent years. The emerging problems of invasive pests, the resurgence of sucking pest complex in variousfield crops, xenobiotic resistance in crop pests to insecticides and bio-toxins, and vector transmission of plant pathogens could be better tackled by insect molecular biology. Insect molecular biological studies would offer strategic research support to resolve conflicts in the taxonomic identity of crop pests, for tackling xenobiotic resistance in transgenic crop systems, design molecular marker probes for detecting insecticide resistance in field storage pests, to assess the sensitivity of natural enemies to insecticides and to develop novel pest management strategies by deploying RNA interference technology.

As insects are the largest group of animals replete with genomics databases, molecular approaches coupled with bioinformatics analyses offer scope for gene mining the databases for identifying novel target sites for next-generation insecticides and rational pesticides. Many online portals and Genomic databases on insects like **Fly Base, Insect Base** etc., provide a comprehensive platform for researchers who have an interest in analyzing insect genomes. Unravelling such big data of genomic information of inputs require sophisticated bioinformatic analytics. Hence, capacity building of entomological students is required essentially to make them updated on insect genomics.

Objectives of the Training

- **To provide hands-on training on tools and techniques used in insect genomics**
- **To inculcate bioinformatic skills to analyze genomic data**
- **To impart training on molecular analysis related to insect taxonomy, physiology and toxicology**
- **To develop human resource development and promote the use of genomic tools in crop protection**

Insect Genomic initiatives at IARI

ICAR-Indian Agricultural Research Institute (ICAR- IARI) is the country's premier institution in agricultural research,education and extension (A^{+}NAACRanking). It has been serving the cause of science and society with distinction through basic research, generation of cutting-edge technologies and development of human resources. The Division of Entomology established in 1905 undertakes basic and strategic research in crop protection.

This Division has made significant contributions in the field ofinsect genomics and molecular biology. Pioneering efforts by Prof. N. Ramakrishnan on genomic mapping of baculoviruses of insect pests during the 1980s laid a strong foundation for insect molecular biological research in the country. Characterization of the gut microbiome of insects, RNA interference strategies for pest management and molecular basis of xenobiotics/host-plant resistance are some of the areas wherein this Division has stamped its contributions. The National Pusa Collections, one of the largest insect collection repositories in the country, maintained by this Division leads research in insect molecular taxonomy.

With this background, the *Centre for Advanced Agricultural Science and Technology* (CAAST) proposes a training programme sponsored by the National Agricultural Higher Education Project (NAHEP) on "**Genomics Assisted Insect Pest Management"** for the benefit of Post Graduate and Doctoral students.

COURSE OUTLINE

The short course will focus on the following aspects:

Molecular barcoding of insects- Genomic sequencing: strategies and approaches- Introduction to Insect Genomic resources-Metagenomic approaches-Genome editing strategies for entomological research-Handling of basic bioinformatic tools for insect genomics-Principles & practices of the molecular phylogeny of insects-Introduction to transcriptome sequencing strategies and their utility- Designing and validation of housekeeping genes -Designing of RNAi constructs - utility of RNAi approaches for pest management- Gene finding strategies -*in – silico* validation - overview of Insect metabolomics; An update on nematode genomics -deployment of genomic approaches for pest and nematode management.

Hands-on training will be imparted on basic molecular biological techniques such as DNA isolation from insects, PCR primer designing and validation; PCR techniques; RNA and cDNA synthesis for expression analysis. Generating barcodes for insects and Genotyping insecticide resistance

Demonstrations and interactive discussions will be held on the handling of raw sequencing, curation, and assembly; Gene annotation and preparation of data for accessioning; Molecular phylogeny.

Visits will be undertaken to IARI/IASRI/NIPGR/NRCPB, New Delhi.

The programme is coordinated by
PG School, IARI