

National Training on

Exploring Host-Pathogen Interactions in Crop Plants: Integrating Classical and Molecular Approaches

February 07-14, 2024

Programme Director

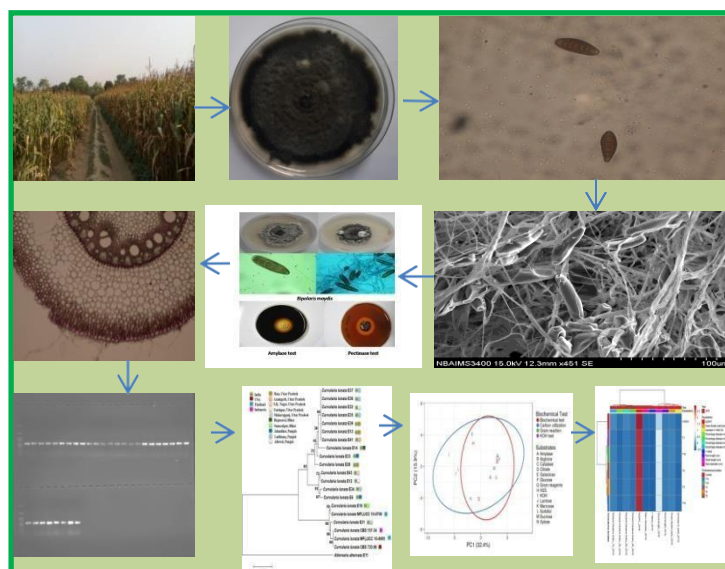
Dr. Alok K. Srivastava, Director

Course Coordinators

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Dr. Nazia Manzar, Scientist (SS) (Plant Pathology)

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ICAR-National Bureau of Agriculturally Important Microorganisms

(ISO 9001:2008 Certified Institute)

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About NBAIM

National Bureau of Agriculturally Important Microorganisms (NBAIM) is one of the premier institutions of Indian Council of Agricultural Research (ICAR), leading research and development programs in the field of microbial research in India. The Bureau aims at the collection, maintenance, and conservation of agriculturally important microorganisms and their resources for future needs. The Bureau is engaged in cutting-edge research in Agricultural Microbiology, Microbial Biotechnology, Plant Pathology, and Bioinformatics for the benefit of researchers and farmers. Apart from core research, human resource development is also one of its mandates. The Bureau has organized several successful training programs on various aspects of basic and applied sciences to benefit different stakeholders of society. In this line, national and international training programs on different areas of molecular and microbial identification, characterization, molecular taxonomy, biological control, plant-microbe interactions, and the applications of bioinformatics in gene mining have been organized since the inception of the Bureau.



Key research areas at ICAR-NBAIM pertained to microbial diversity analysis from extreme and unique habitats, biological control of plant diseases, microbiome, microbe-mediated plant growth promotion, plant-microbe interaction, abiotic stress tolerance, quality microbial management system with special emphasis on biosystematics, DNA fingerprinting, microbial genomics and proteomics, metabolomics and bioinformatics.

Background

In the dynamic field of plant pathology, understanding the intricate interactions between plants and pathogens is crucial for developing effective disease management strategies. The classical approaches in studying plant-pathogen interactions lay the foundation for unraveling the mysteries of disease development and progression. Techniques such as surveying, Koch's postulates, and disease severity assessments have long been employed for observational studies, allowing researchers to identify symptoms, patterns of infection, and pathogen prevalence in plant populations. Isolation and culturing of pathogens using classical microbiological techniques facilitate their characterization, while Koch's postulates remain a fundamental tool for establishing causal relationships between pathogens and diseases. Disease progress curves and histopathology provide valuable insights into the dynamics of infection and host responses. Additionally, classical taxonomy and plant resistance studies contribute to understanding the morphological and physiological characteristics of pathogens and investigating natural or induced resistance mechanisms. As technology advances, molecular tools have revolutionized the study of plant-pathogen interactions. DNA and RNA extraction, coupled with PCR and sequencing techniques, enable specific pathogen profiling and genetic diversity analysis. Bioinformatics tools play a crucial role in the analysis of sequencing data, aiding in the identification of pathogen species and strain. Genomic characterization and phylogenetic analysis further enhance our understanding of pathogen behavior. Transcriptomics, with its focus on gene expression, provides a comprehensive view of plant responses during pathogen interactions. Retrieving genomic data from public databases, sequence alignment, assembly, annotation, and various analyses such as structural, functional, and pathway analyses are integral to gaining insights into the genomic landscape of plant-pathogen interactions. Delving deeper into the host-pathogen interactome, this exploration extends to biochemical and cellular levels. An in-depth examination of plant defense mechanisms, including biochemical signaling, cellular responses, hormone signaling, and transcriptional regulation, sheds light on the intricacies of plant immunity. Understanding key components such as reactive oxygen species, phytoalexins, and immune receptors provides a comprehensive picture of the defense arsenal employed by plants. From induced systemic resistance to effector recognition and hypersensitive responses, the interactome elucidates the complex strategies plants employ to defend against pathogens, offering valuable insights for the development of sustainable agricultural practices.

Theme

In this perspective, the following thematic areas will be addressed in this hand's on training programme -

- Introduction and Classical Approaches in Studying Plant-Pathogen Interactions.
- Molecular tools for Investigating Plant-Pathogen Interactions: Unravelling Pathogen Profiling, and Pathobiome Insights
- Transcriptomics Strategies for characterization of plant host pathogens interactions- An omics approach
- Bioinformatics and Next generation technologies for studying host pathogen interactions
- Host -pathogen Interactome: Insights into Défense mechanism at biochemical and cellular level

The training programme will include both lectures and practical sessions on the above thematic areas. Resource experts from the Bureau and other reputed institutes will address the participants.

Expected benefits to the participants

- Participants will get hands on experience in characterization of pathogens, following conventional techniques and advanced molecular tools.
- Early career researchers and anyone involved or embarking into this field will be benefited by getting exposure and know how to cutting edge research in plant microbe interaction.

Eligible participants

Scientists/Assistant Professors/Lecturers or above, Technical officers, Post-docs, Research scholars and Students from any university/institute/organization working in the area of biological sciences.

Fees for the training

Rs. 8000/- for Scientist/Lecturers/Technical officers from public/private Universities or Govt. Institutions, Rs. 5000/- per trainee for students/research scholars and Rs. 12,000 per trainee for researchers from private or non-government organizations/Companies/ Firms. **The fees include accommodation, food, and training materials.**

How to apply?

Eligible participants may write to the Director, ICAR-NBAIM along with their RESUME (not more than one page) and Application form on/or before 25th January, 2024. The selected candidates will be notified on 30th January, 2024 by email.

E-mail, Director ICAR-NBAIM- director.nbaim@icar.gov.in

Please send a copy also to abhijeet4497@gmail.com or naziamanzar786@gmail.com or jyotisingh58@outlook.com

For any queries please contact: 8810512074 (Dr. Abhijeet), 06395985927 (Dr. Nazia), 8527184215 (Dr. Jyoti)

* Bank Details:

Registration fee may be paid through Cash/DD/BankTransfer:

In favour of ICAR-Unit NBAIM, payable at MaunathBhanjan, U.P.

Account Name: ICAR-NBAIM

Account Number-11143371878

IFSC code-SBIN0001671

Branch Name-SBI, Sahadatpura, Maunath Bhanjan, U.P.

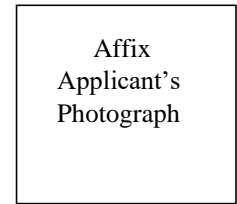


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(Indian Council of Agricultural Research)



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on
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APPLICATION FORM



Personal Details Name :
Gender :
Designation/Occupation :
E-mail :
Mobile/Contact Number(s) :
Contact Details Full Address :
City & State :
Academic Details
Degree (M.Sc./M.Phil. /Ph.D.) :
Subject Specialization :
College/Department :
University/Institute :
Accommodation Required : Yes/ No (Please select with a tick (√) mark)

Registration fees (Tick whichever is applicable)

Post-docs, Research scholars and Students from any university/institute/ organization	Rs. 5000/-
Scientist/Lecturers/Technical officers from public/private Universities or Govt. Institutions	Rs. 8000/-
Researchers from private or non-government organizations/Companies/ Firms	Rs. 12,000/-

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Signature of the Applicant