



WELCOME TO OUR

MBUST Insights

Contributors of this Newsletter Issue:

Dr. Sarbesh Das Dangol, Dr. Bhushan Shrestha, Dr. Anupama Shrestha, Mr. Atmaz Shrestha, Dr. Sabina Shrestha, Dr. Sudip Pandey, Dr. Saurabha Bhattarai

JUMLA VISIT

Sample collection and problem analysis of rice and millet

By Dr. Sarbesh Das Dangol



Our visit to Jumla from September 22 to September 30, 2024, was led by Dr. Sarbesh Das Dangol (MBUST) and Dr. Hira Kaji Manandhar (Nepal Plant Diseases and Agro Associates Pvt. Ltd.). The team visited various rice and millet field sites in Jumla to identify the challenges faced by local farmers. It was observed that finger blast in millet and rice blast were predominantly prevalent. Researchers collected blast-infected samples from Bijaynagar (500 meters from Jumla Airport), the Chandannath region, Tatopani, Chumchaur and surrounding areas, various wards of Patarasi, the Gutthichaur area, Garjyangkot, and other locations. Local Jumli Marshi rice, cultivated at Chumchaur, the world's highest-altitude rice plantation, is endangered and requires immediate intervention. We extend our gratitude to the Nepal Agricultural Research Council (NARC) in Jumla for hosting and facilitating the visit.





Visit of Associate Prof. Dr. Allah Bakhsh

MOU BETWEEN TWO UNIVERSITIES INITIATED

By Dr. Sarbesh Das Dangol



Dr. Sarbesh Das Dangol applied and secured the grant through the UNESCO-TWAS Visting Expert Programme to facilitate the visit of Associate Professor Dr. Allah Bakhsh from the Center for Excellence in Molecular Biology (CEMB), University of the Punjab, Pakistan. Dr. Bakhsh had a pleasant visit to our university in Chitlang on September 9-10, 2024. Dr. Bakhsh deeply appreciated the lush green beauty of Chitlang, the modern infrastructure of the university, and the mission and vision of MBUST in comparison to other conventional universities in Nepal. Dr. Bakhsh delivered lectures on September 9 and 10 at MBUST to university students and faculty members, covering his areas of expertise, including transgenic insect-resistant cotton and potatoes, chloroplast genome engineering, genome editing in potatoes, as well as his work at CEMB and previous research activities. Dr. Bakhsh also discussed various prospects for collaboration with MBUST and gifted us plasmid and bacterial materials for research purposes. Before his departure to Pakistan, Dr. Bakhsh and Prof. Rajendra Dhoj Joshi initiated the process of establishing an MoU between MBUST and the University of the Punjab.



Guest Lecture Delivered

DR. BHUSHAN DELIVERED LECTURE AT PATAN MULTIPLE CAMPUS

By Dr. Bhushan Shrestha



Associate Prof. Bhushan Shrestha delivered a guest lecture on "Domestication of wild edible mushrooms of Nepal" at Department of Environmental Science of Patan Multiple Campus on August 30, 2024.



GetGenome Committee Formed

TWO COMMITTEE MEMBERS FROM MBUST

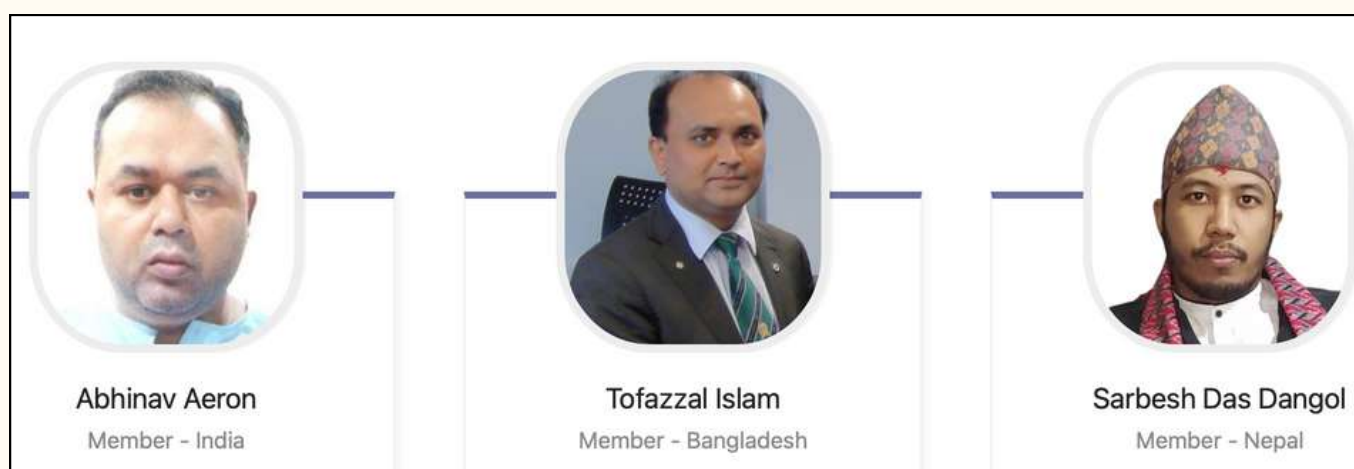
By Dr. Anupama Shrestha



Recently, GetGenome South Asia (GGSouthAsia2024) committee team was formed where two MBUST faculty members are serving as committee members. Dr. Anupama Shrestha is a vice-chair and Dr. Sarbesh Das Dangol is a member.

Briefly, GetGenome is a non-profit organization dedicated to empowering early-career scientists by providing equitable access to genomics technology and related education. GetGenome promotes open science principles to ensure that scientific research benefits everyone. They offer whole genome sequencing of identified beneficial rhizobacteria at no cost. Typically, whole genome sequencing can cost between \$500 and \$5,000 per bacterium, depending on the sequencing technology used, the complexity of the genome, and the service provider.

This project shall provide whole genome sequencing services to many researchers of Nepal working on microorganisms. Furthermore, this networking could lead to better opportunities in line with the visions and missions of MBUST.



Free to gain more insights from the website where more details about the project and the organization can be explored in the link provided below:

<https://getgenome.net/callforprojects/ggsouthasia2024/committee>

Knowing Plant disease

PHYTOPHTHORA BLIGHT OF PEPPER

By Atmaz Shrestha and Dr. Anupama Shrestha
Plant Protection Biological Control Research Center
(PPBCR)

Introduction: *Phytophthora* blight is a serious disease that mostly affects bell pepper, egg plant, tomato, lime bean and most cucurbits. It is caused by the fungal- like oomycete pathogen *Phytophthora capsici*. The disease can cause significant crop damage the potential for up to 90% crop loss in susceptible varieties.



Leaves wilting due to *P. capsici* infection (Left) and fruit rot in pepper (Right). Disease sample was collected from Chitlang.



Colony morphology of *P. capsici* in V8 juice agar: obverse (Top Left) and reverse (Top Right) and lemon shaped sporangia (Bottom)

© Photo by Dr. Anupama Shrestha, PPBCR, MBUST

Symptoms: *P. capsici* can infect the roots, stems, and fruits of the plant, which frequently causes wilting and rotting. Roots may appear black and water-soaked. Fruit rot occurs showing white, yeast like growth.

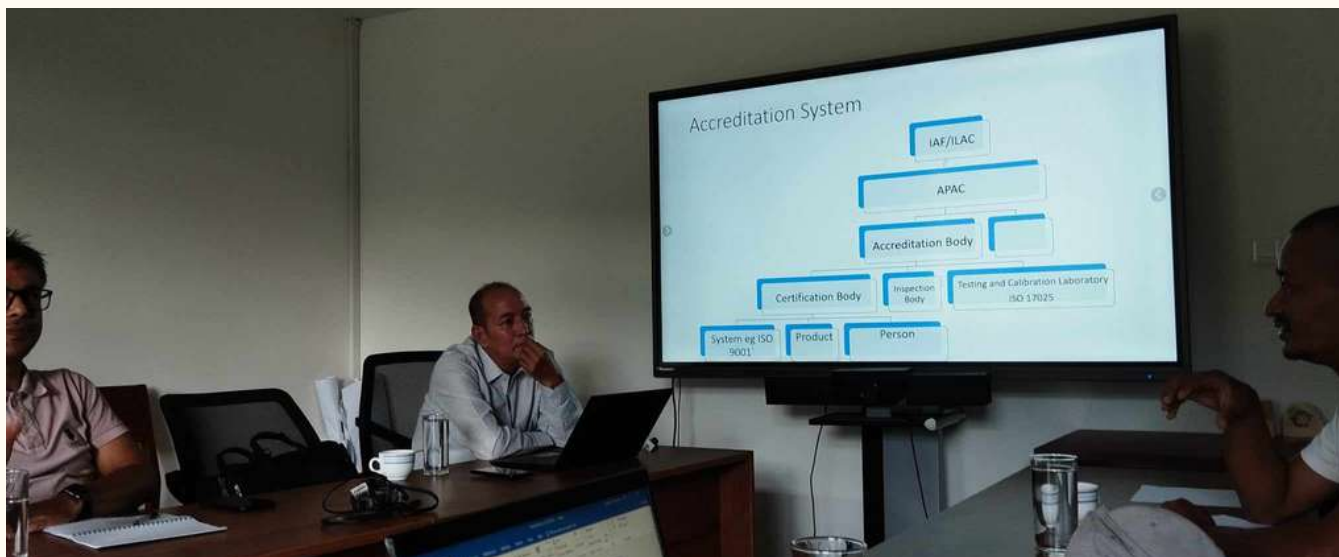
How to manage?

1. **Irrigation:** Drip irrigation should be used instead of overhead irrigation to reduce water splashing, which can disperse the infection. The water used for irrigation should be safe.
2. **Soil Drainage:** Use raised beds to keep water from building up and plant in well-drained fields.
3. **Crop Rotation:** To stop the pathogen life cycle, rotate crops which contain non-host species (such as grains like maize and wheat) for a minimum of three years.
4. **Sanitation:** To lessen the sources of infection, remove and dispose of sick fruits and plants appropriately. Keep disposed infected parts of plant away from irrigation supplies.
5. **Plant Selection:** Use resistant varieties of peppers when available. Some cultivars show moderate resistance to *P. capsici*.
6. **Organic Treatments:** Use Organic Materials Review Institute (OMRI)-listed fixed copper formulations, which can help manage the disease when applied preventively. For example: Copper oxychloride, the recommended dosage is typically 500 grams per 200 liters of water per acre.
7. **Biological Control:** Biological agents that suppress the pathogen are *Bacillus* spp.

Accreditation of Analytical Laboratories

ENSURING QUALITY AND RELIABILITY IN ANALYTICAL TESTING

By Dr. Sabina Shrestha



On September 2, discussions emphasized the critical role of laboratory accreditation in ensuring quality and reliability in analytical testing. Accreditation serves as a benchmark for laboratories to demonstrate their competence and adherence to internationally recognized standards, particularly ISO/IEC 17025. Mr Indu Bikram Joshi, former Joint Secretary of the Ministry of Education, Science and Technology (MoEST) highlighted on requirement of accredited laboratories to enhance trust and reduce errors, provide regulatory compliance and market access, foster trust among stakeholders, and promote international trade.

Discussion on Forest Biomaterials at NeFTA

A STEP TOWARDS SUSTAINABLE FORESTRY

By Dr. Sabina Shrestha and Dr. Sudip Pandey

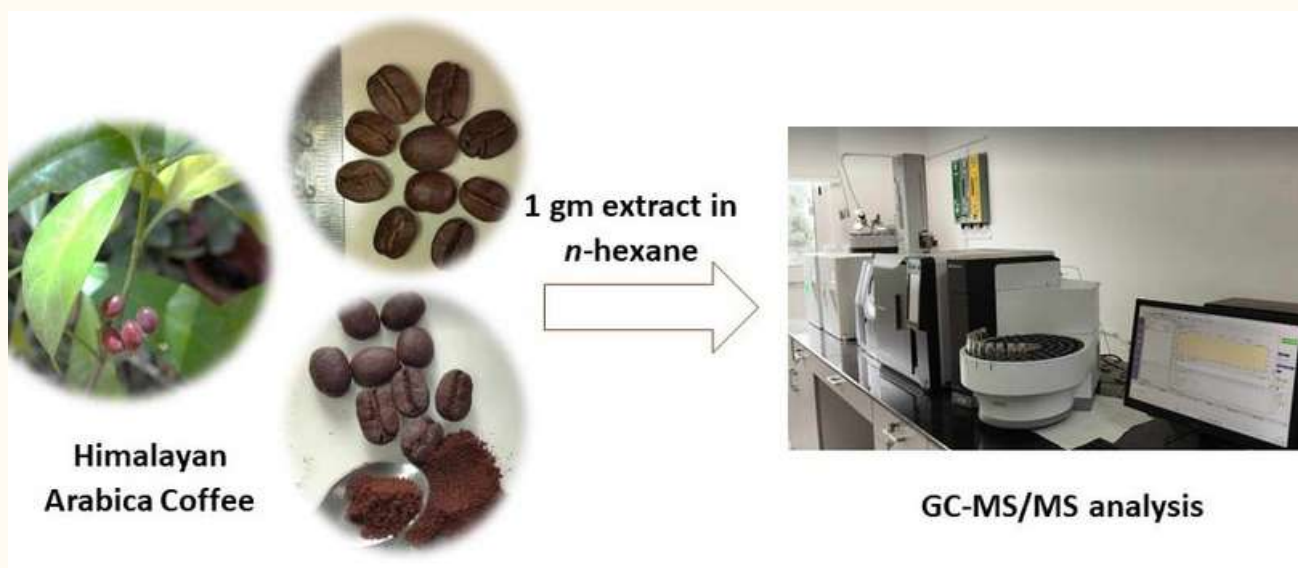


On September 29, a discussion was held at the Forest Technician's Association of Nepal (NeFTA) focusing on the integration of forest biomaterials into the educational curriculum. Key participants included Mr. Govind Raj Pandey, Mr. Kiran Timilsina, Mr. Rajendra Neupane, Mr. Bimal Khatiwada, and Mr. Bhairab Ghimire of NeFTA and Dr. Sabina Shrestha and Dr. Sudip Pandey from MBUST. The dialogue highlighted the urgent need to develop a curriculum that encompasses both technical and practical aspects of forest biomaterials.

Unraveling the Secrets of Coffee

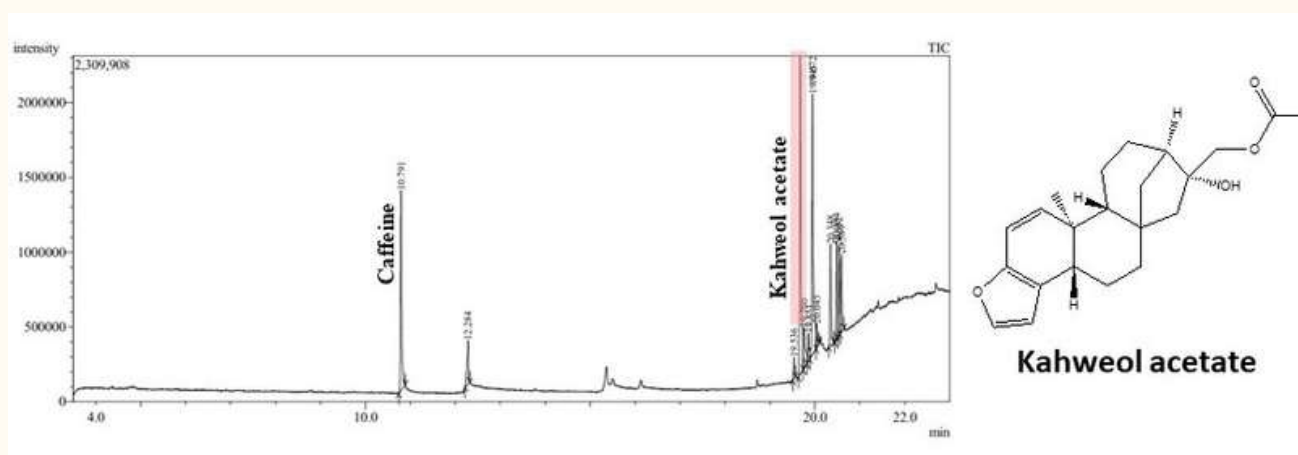
KEY INGREDIENTS OF HIMALAYAN ARABICA

By Dr. Sabina Shrestha



The flavor of coffee is significantly influenced by its brewing process. Brew's flavour determines cup quality of coffee and its market. One key component that enhances the quality of Himalayan Arabica coffee is Kahweol acetate. This diterpene is recognized for its numerous health benefits, including anti-inflammatory, anti-diabetic, and anti-osteoclastogenesis activities. Kahweol acetate plays a crucial role in cancer prevention, exhibiting tumor-suppressive properties through various mechanisms such as inducing apoptosis, inhibiting cell proliferation, and reducing cell migration. These effects contribute to its potential in cancer therapies, making it a compound of great interest in both nutritional and medical research.

The MBUST laboratory expresses gratitude to Reader's Hub Coffee, Mount Brew Coffee, and Mokshya Coffee Company for providing coffee bean samples for ongoing studies into the beneficial compounds found in Himalayan Arabica coffee.



Seminar on Urban Spatial Data Analysis

FOCUS ON MOBILITY DATA

By Dr. Sudip Pandey



On September 12, 2024 (Thursday), Dr. Sudip Pandey from Madan Bhandari University of Science and Technology attended the seminar on Urban Spatial Data Analysis and its Applications at the Nepal Academy of Science and Technology (NAST). The seminar focused on mobility data for road, traffic, and early disaster warning in Nepal. Participants included professionals from road management, traffic management, and the Survey Department. Prof. Yoshihide Sekimoto and Associate Prof. Dinesh Manandhar from the University of Tokyo's Center for Spatial Information Science explained how spatial data and GNSS can address challenges in road, traffic, and disaster management.



Visit of Nepal Engineering Council Delegates

BRIEFING OF FBM AND OA PROGRAMS

By Dr. Saurabha Bhattarai and Dr. Anupama Shrestha



Dr. Padma Bahadur Shahi, chairperson of Nepal Engineering Council (NEC), his delegates and Prof. Lock Kai Sang from Singapore Institute of Technology visited the MBUST laboratories. Dr. Saurabha Bhattarai and Dr. Sudip Pandey provided a briefing on the ongoing research and future plans for the Forest Biomaterials program laboratories. The briefing covered the Natural Product Chemistry Laboratory, the utilization of forest biomass, research on wood anatomy, and the potential use of bamboo in structural applications. The delegates were impressed by the rich diversity of medicinal plants found in the nearby periphery of Chitlang. They also expressed great interest in the bamboo structures and shared suggestions for their application in various structural purposes. Plant Protection Biological Control Research Center (PPBCR) explained delegates about the ongoing research to support organic agriculture, i.e. the use of indigenous microorganism to control the plant diseases in organic agriculture farming system.



Editorial Team

Editor-in-chief: Prof. Dr. Rajendra Dhoj Joshi

Managing Editor: Associate Prof. Padma Sunder Joshi / Prof. Dr. Sanjay Nath Khanal

Section Editor: Dr. Sarbesh Das Dangol

Copy Editors: Dr. Sabina Shrestha, Dr. Bhushan Shrestha, Dr. Anupama Shrestha,
Dr. Sabin Basi, Dr. Sudip Pandey, Dr. Kishor Timsina, Dr. Saurabha Bhattarai,
Dr. Bhuwan Bhattarai

Contributing authors/photographers: Organic Agriculture (OA) team, Forest Biomaterials (FBM) team, Artificial Intelligence (AI) team, Data Science (DS) team

Any Questions?

info@mbust.edu.np

9840088016, 9849848053

Chitlang, Thaha Municipality-9,

Makawanpur,

Bagmati Pradesh, Nepal

www.mbust.edu.np