

WELCOME TO OUR

MBUST Insights

Contributors of this Newsletter Issue:

Dr. Sudip Pandey, Dr. Sarbesh Das Dangol, Dr. Anupama Shrestha, Ms. Sabnam Subedi, Dr. Sabina Shrestha and Dr. Saurabha Bhattarai

MBUST is an Associate Partner of MEDfOR

By Dr. Sudip Pandey



We are pleased to share that the Mediterranean Forestry and Natural Resources Management (MEDfOR) secretariat has confirmed MBUST's status as an associate partner. We are now part of a wider community of researchers, professors, and universities. The Universities in the program are primarily focused on agriculture and forestry, which align perfectly with our research interests. The MEDfOR team is co-funded by the Erasmus+ programme of the European Union. Let's explore more opportunities together and make the most out of this collaboration.

Visit to University Grants Commission- Nepal

By Dr. Sarbesh Das Dangol



Dr. Sarbesh Das Dangol and Dr. Anupama Shrestha visited the University Grants Commission- Nepal (UGC) to discuss how MBUST can benefit from the grant applications both for faculty members and the students. As MBUST is the first research-oriented university in Nepal, the funding opportunities is crucial for the university to achieve the university mission.



GetGenome SouthAsia-2024

BUILDING SOUTH ASIAN RESEARCH POTENTIALITY

By Dr. Sarbesh Das Dangol

GGSouthAsia2024



Countries: Bangladesh, Indonesia, India, Malaysia, Nepal, Sri Lanka, Thailand

Service: whole-genome sequencing of strains, training

Scope: non-pathogenic, cultural bacteria, South Asia country

Application: Online - <https://getgenome.net/callforprojects/ggsouthasia2024>

Launch: 1st November 2024

Deadline: 19th December 2024

GGSouthAsia2024 Application Form

Please complete

* Required

Personal information

1. Full name (First, Last) *

Enter your answer

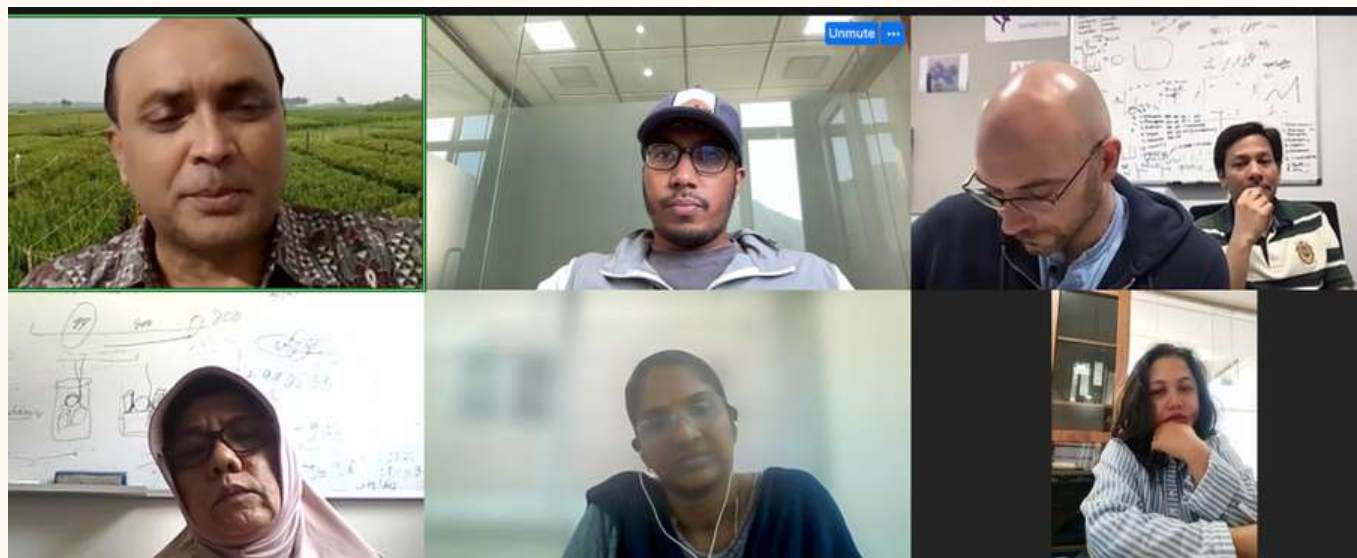
2. What is your position (job title)? *

☐ Undergraduate student

☐ Postgraduate MSc Student

On October 23, 2024, Dr. Sarbesh Das Dangol and Dr. Anupama Shrestha discussed the launch of the GetGenome South Asia branch, scheduled for November 1, 2024. This society performs whole genome sequencing of beneficial organisms, rather than pathogens, at zero cost. The Assistant Professors will represent MBUST in evaluating applicants who intend to send their samples to GetGenome for processing.

After screening the applicants, an estimated 45 participants from South Asia will be selected, with GetGenome accepting an average of 4-5 samples per participant. They also assist applicants in finding collaboration opportunities with scientists working in similar fields and for data analysis purposes. Furthermore, they do not participate as co-authors or claim patents for processing the samples.



Blast Disease

STUDY ON RICE AND MILLET DISEASES

By Dr. Sarbesh Das Dangol



Last month, Dr. Sarbesh Das Dangol and Dr. Hira Kaji Manandhar (Chairman of NPDA- Nepal Plant Disease and Agro Associates Pvt. Ltd.) visited Jumla to collect blast-infected samples in rice and millet. During the Dashain vacation, Dr. Sarbesh and Dr. Bhushan Shrestha visited NPDA and have been isolating blast pathogens from the samples. The work is also going on at MBUST. Along with Dr. Anupama Shrestha, the team aspires to perform single spore isolation and sequencing to identify races of blast pathogens. Ms. Jeneriya Chaudhary, an MS thesis student under the supervision of Dr. Hira Kaji and Dr. Sarbesh, also assisted the team during the NPDA visits. Moreover, the team will also evaluate the susceptibility of rice and millet plants and the pathogen's virulence. This research will help the team develop blast-resistant crops.



Knowing Plant Disease

CLUBROOT

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

Introduction: Clubroot disease is caused by the soil-borne pathogen *Plasmodiophora brassicae*, which severely affects cruciferous crops like cauliflower, cabbage, etc. The disease thrives in moist, acidic soils and can cause significant yield losses. In Nepal, particularly in Chitlang, clubroot is a common and devastating problem in vegetable production.



Symptom in root of cauliflower



Field visit and sampling

© Photo by Dr. Anupama Shrestha, PPBCR, MBUST

Symptoms:

Root Symptoms:

- Formation of large, swollen, and distorted roots resembling clubs, which impede water and nutrient uptake.
- Fine root hairs may disappear, and the roots often have a lumpy, rough texture.

Above-Ground Symptoms:

- Stunted growth and wilting, especially in warm weather.
- Yellowing of leaves and premature plant death in severe cases.
- Plants may show reduced vigor and fail to form heads.

How to manage?

1. Liming: Adjust the soil pH to 7.2 or higher by applying agricultural lime. This reduces the pathogen's ability to infect plants.
2. Implement a 4–5-year crop rotation with non-cruciferous crops to reduce the pathogen's population in the soil. This is crucial in managing the disease.
3. Use clubroot-resistant cauliflower varieties, which are less susceptible to infection and help manage disease levels in the field.
4. Apply compost or well-decomposed manure to enhance soil health, improve structure, and potentially suppress the pathogen.
5. Mustard meal or other organic bio-fumigants may reduce pathogen populations in the soil when incorporated before planting.
6. Incorporate beneficial microbes like *Trichoderma* or *Bacillus subtilis*, which have shown potential in suppressing *Plasmodiophora brassicae* and promoting plant growth.

Enhancing Research through Expert Visits

INSIGHTS FROM PROF KOIRALA

By Dr. Sabina Shrestha

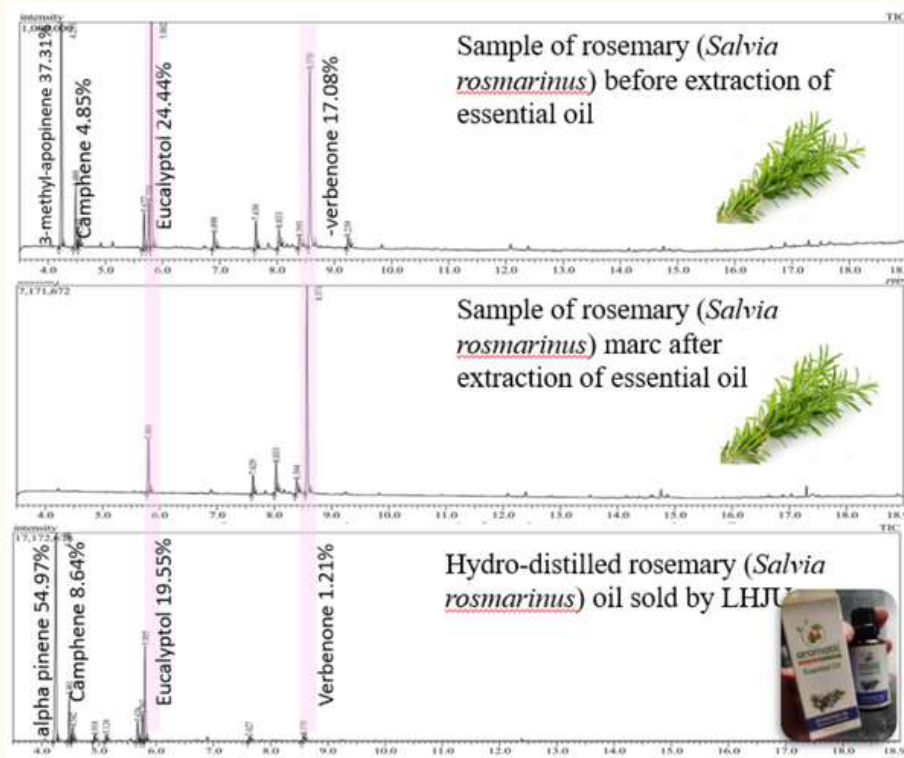
Professor Madan Koirala visited (28–29 October, 2024) the laboratories of MBUST and shared insights on the ongoing research work being conducted at the institution. Prof. Madan Koirala is well-known for his contributions to the fields of climate change, biodiversity, and mountain ecology. His research has focused on the impacts of climate variability on treeline dynamics in the Himalayas, as well as the ecological assessments of various environments in Nepal.



Quality Assurance in Essential Oil Production

ROSEMARY ESSENTIAL OIL USING ADVANCED GC-MS/MS

By Dr. Sabina Shrestha



Essential oil products are undergoing successful analysis at MBUST analytical laboratory using advanced Gas Chromatography-Mass Spectrometry/Mass Spectrometry (GC-MS/MS) techniques. This state-of-the-art technology allows for precise characterization of essential oils, ensuring their purity and quality. Larke Himal Jadibuti Udhyog, an industrial partner MBUST, is currently engaged in a comprehensive composition analysis for the development of rosemary essential oil products.

This initiative aims to enhance product quality and efficacy, ensuring that the essential oils meet industry standards and consumer expectations.

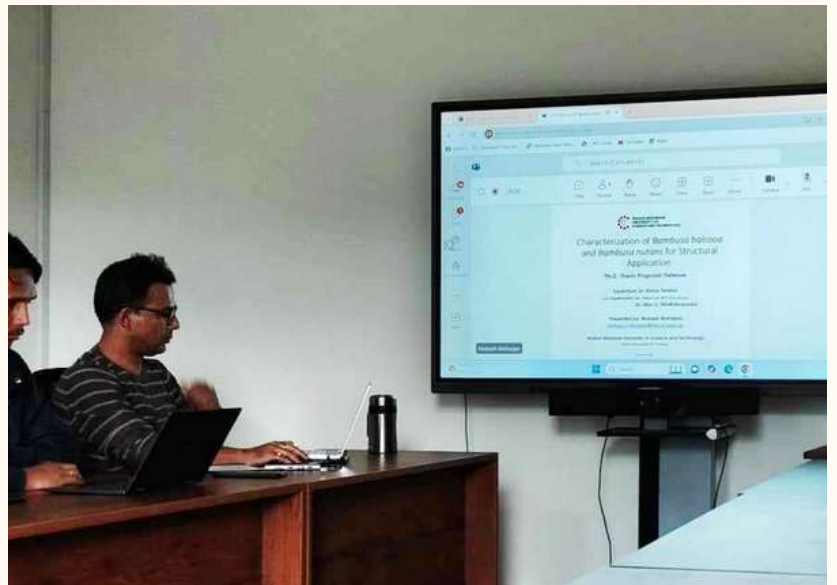
Advancing Sustainable Housing Solutions

ER. MAHARJAN'S RESEARCH ON BAMBOO PLANTATION IN NEPAL

By Dr. Sabina Shrestha



Er. Mukesh Maharjan recently conducted a site visit to the Baliya treatment plant of Green Gold Solution Pvt. Ltd. in Taltalaya, lthari, as part of his research on bamboo plantation in Nepal. This visit aims to enhance his understanding of *Bambusa nutans*, a species of bamboo crucial for his studies. Maharjan's research is supported by the Hilti Foundation from Liechtenstein and the BASE Bahay Foundation in the Philippines, both of which focus on sustainable housing solutions using bamboo technology. Maharjan's work aligns with these broader goals, contributing to the understanding and application of bamboo as a viable building material in Nepal. The collaboration between these foundations and local researchers underscores a commitment to improving housing conditions while leveraging local resources effectively.

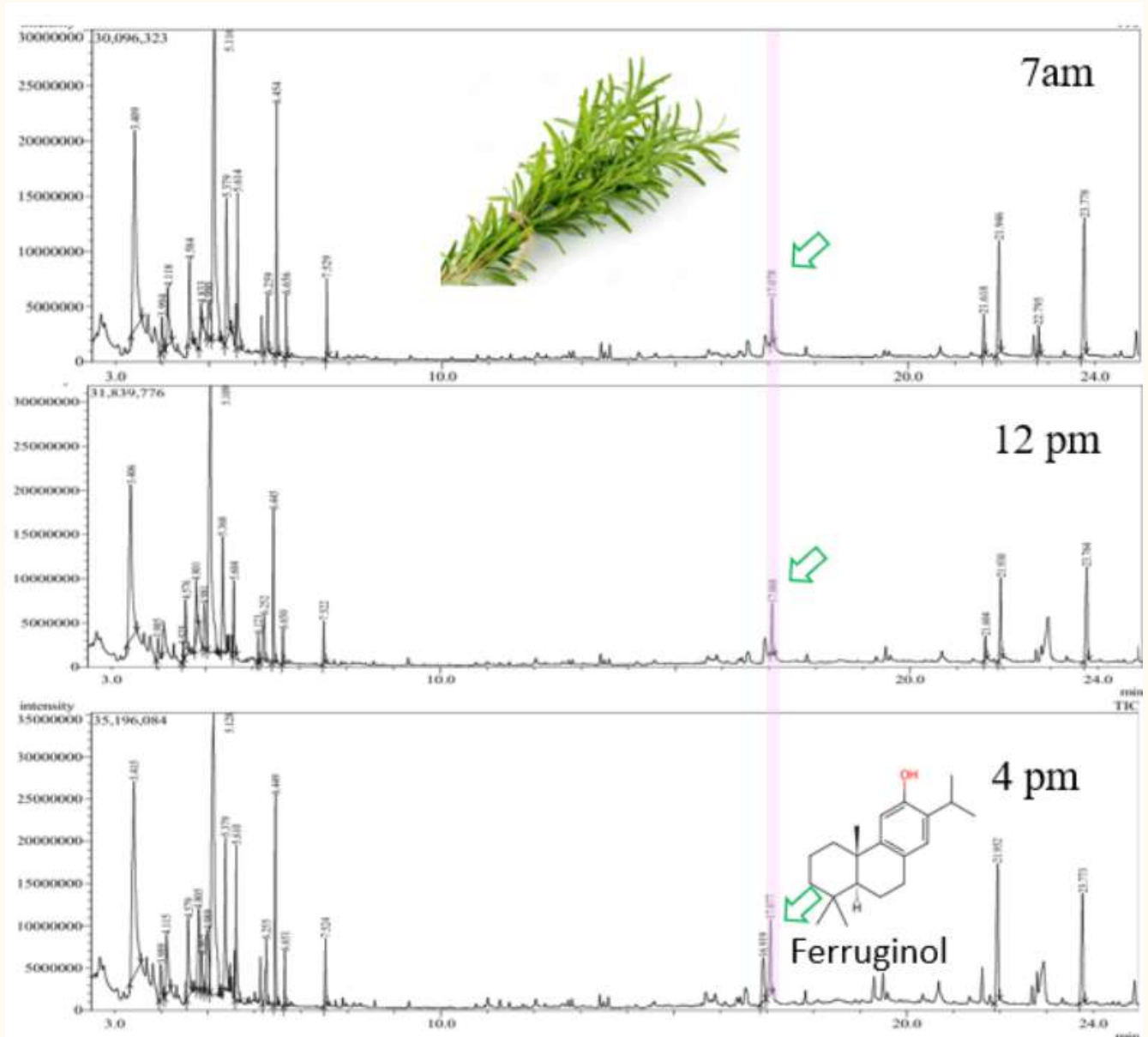


Er. Mukesh Maharjan successfully defended his research proposal titled "Characterization of *Bambusa balcooa* and *Bambusa nutans* for Structural Application" in the Forest Biomaterials Program. The defense took place in front of Professor Prachanda Man Pradhan, Dean of Manmohan Technical University, highlighting the academic rigor and significance of Maharjan's work. The defense session was marked by constructive feedback from Professor Pradhan, emphasizing the importance of thorough research methodologies and practical applications in the field of biomaterials. This event not only underscores Maharjan's commitment to advancing knowledge in forest biomaterials but also reflects the growing interest in bamboo as a resource for sustainable development.

Temporal Analysis of Essential Oil Components

VARIATION OF FERRUGINOL CONCENTRATIONS IN ROSEMARY ESSENTIAL OIL THROUGHOUT THE DAY

By Dr. Sabina Shrestha



Analysis of changes in concentration components of rosemary essential oil planted by Larke Himal Jadibuti Udhyog at MBUST site in Chitlang during different hours of a day. Analysis revealed that a compound of interest ferruginol concentrations varied from 1.88 %, 2.91%, 3.44 % area at 7am, 12 pm and 4 pm, respectively. Ferruginol is known to prevent degeneration of dopaminergic neurons by enhancing clearance of α -synuclein in neuronal cells. This kind of research underscores the importance of understanding the temporal variations in essential oil components, which can enhance product development and quality control in the industry.

Participation at ICAF Conference

PRESENTATIONS ON NANOPARTICLES AND DEEP LEARNING INNOVATIONS

By Dr. Saurabha Bhattarai



From October 25 to 27, 2024, the International Conference on Advanced Functional Materials (ICAFM) was held at Hotel Himalaya, gathering experts and researchers from around the globe to discuss recent advancements in material science. Among the distinguished speakers were Assistant Professor Dr. Saurabha Bhattarai and Assistant Professor Dr. Bhuwan Bhattarai from MBUST, who represented the university internationally.

Dr. Saurabha Bhattarai presented his research on the "Influence of Nanoparticles on the Fuel Properties of Biodiesel," exploring the role of nanomaterials in enhancing biodiesel's performance and sustainability. His insights highlighted potential applications in clean energy, sparking interest among attendees from both academia and industry. Dr. Bhuwan Bhattarai shared his work titled "Deep Learning-Based Singing Voice Separation on DSD100 and NISVS Dataset," where he discussed innovative applications of deep learning in audio processing, specifically focusing on music separation tasks. His presentation demonstrated the integration of artificial intelligence in media technology and drew significant engagement from researchers specializing in machine learning and audio engineering.

The participation of MBUST faculty not only enhanced the university's visibility but also attracted interest from conference participants keen on learning more about MBUST's programs and research initiatives. Many attendees wanted to visit the university, marking a positive step for future collaborations and exchanges.



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