

WELCOME TO OUR

MBUST Insights

Contributors of this Newsletter Issue:

Dr. Ritu Raj Lamsal, Dr. Sarbesh Das Dangol, Dr. Sabina Shrestha



Madan Bhandari University of Science and Technology complex

MBUST RISES HIGHER

Madan Bhandari University of Science and Technology (MBUST) based in Chitlang of Bagmati Province advances in research excellence while promoting transparency, innovation, collaboration, and global recognition across diverse scientific disciplines.

MoChWo 2025

MBUST Co-partnered the conference



Workshop on UAV & Remote Sensing

Exploring the Future of Aerial Technology

By- Dr. Ritu Raj Lamsal

Madan Bhandari University of Science and Technology (MBUST) , Chitlang successfully concluded a comprehensive three-day workshop on Drone (Unmanned Aerial Vehicle - UAV) and Remote Sensing from October 15th to 17th, 2024. The event provided 24 students with an immersive learning experience, skillfully blending essential theory with extensive hands-on practice. The curriculum was thoughtfully structured to cover a wide range of topics. The workshop was led by Dr. Robert Jackisch (Asst. Professor, Technical University of Berlin, Germany), who provided invaluable international insights, and Dr. Ritu Raj Lamsal of MBUST, who contributed essential local context and hands-on guidance. The entire event was seamlessly coordinated by Dr. Rajib Subba, ensuring a smooth and productive experience for all involved. The theoretical sessions established a strong foundation, focusing on the principles of drone flight, paramount safety protocols, legal precautions, and precision flying techniques. Furthermore, the workshop delved into the vast applications of UAVs across diverse fields such as agriculture, forestry, and disaster management, giving students a clear perspective on their potential future use.



A Group Photo

A significant highlight and unique value of the workshop was the in-depth focus on advanced remote sensing technology, particularly Light Detecting and Ranging (LiDAR). Participants gained both theoretical and practical knowledge of how LiDAR systems work and their advantages for mapping and surveying. The workshop also highlighted the critical role of inbuilt Simultaneous Localization and Mapping (SLAM) technology, explaining its function in enabling real-time mapping in complex environments where GPS signals are weak or unavailable. Overall, the workshop was exceptionally fruitful. It successfully translated complex technological concepts into tangible skills, empowering students to operate UAVs safely and understand the data acquisition pipeline for LiDAR.



Expert session by Dr. Robert Jackisch on the principles and applications of UAVs.



Innovations at International Conference

Representing researches of MBUST and GATC at 7th MoChWo

By- Birendra Mahara

The Genomics and Tissue Culture Laboratory (GATC) at Madan Bhandari University of Science and Technology (MBUST) is a leading center for innovative research, contributing to various national and international projects. Our recent success includes completing a significant project funded by the Ministry of Science and Technology, which I presented at the 7th International Conference on Mountains in the Changing World (MoChWo, 2025) with the title "Exploring Lighting Effects on Growth of Nutrient-Rich Indigenous Crops in Nepal," which focused on the impact of different coloured LED light and their combinations on the growth of Jumli Marsi, Proso Millet, and Finger Millet, which are nutrient rich indigenous crops of Nepal, yielding important insights for optimizing growth conditions. Dr. Sarbesh also presented our research "Genome editing of local rice cultivars to develop blast-resistant rice lines", funded by University Grants Commission. This showcased GATC Lab's contributions as co-organizers of the conference.

One of the highlights of the event from our university was the symposium on "Forest Biomaterials in Sustainable Development," discussing sustainable solutions from forest resources. Five other students from MBUST presented their research works at conference through posters and oral presentations. Congratulations to Miss Binita Silwal for winning the best oral presentation award.

Additionally, I volunteered at the conference and I took on the role of rapporteur for the session "From Genome to Landscapes," chaired by Dr. sarbesh Das Dangol. This enriching experience allowed me to connect with experts and enhance my scientific communication skills. I am grateful to MBUST for ongoing support and opportunities.



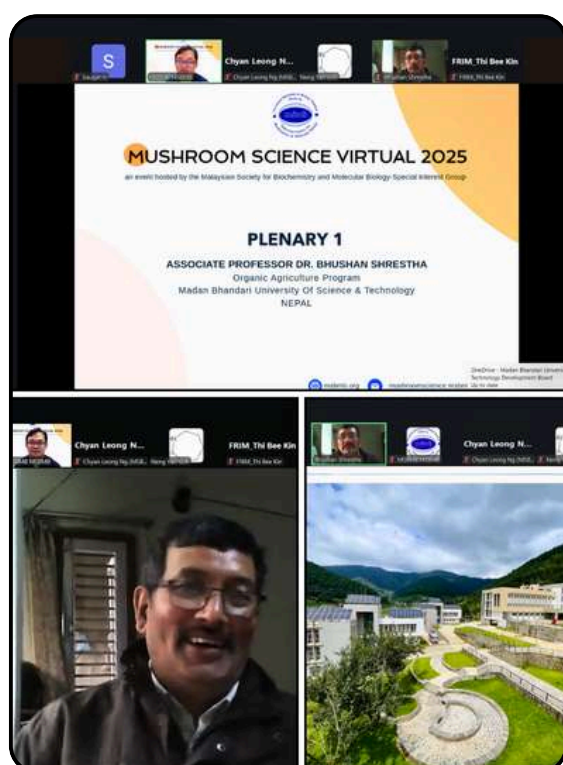
Glimpses of the 2 days in conference

Mushroom Science Virtual 2025

Plenary Talk by Assoc. Prof. Dr. Bhushan Shrestha

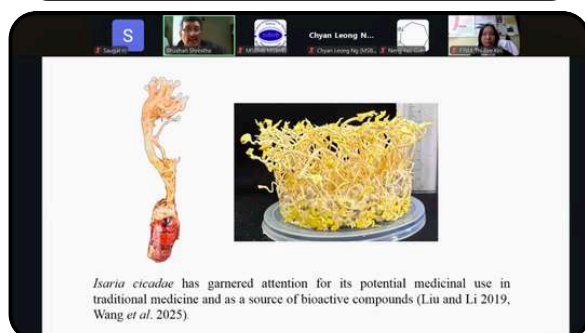
By- Saugat R.C.

Dr. Bhushan Shrestha was invited as one of the plenary speakers at Mushroom Science Virtual 2025, organized by the Malaysian Society for Biochemistry and Molecular Biology (MSBMB) – Special Interest Group: Mushroom Science from October 29–30, 2025. In his talk entitled “Exploring Antimicrobial Properties of Native Mushrooms of Chitlang, Nepal,” Dr. Shrestha shared insights from his ongoing research on the ethnomycology and antimicrobial potential of wild mushrooms collected from Chitlang, Nepal. He highlighted how wild mushrooms, once abundant in local markets, have become increasingly rare following the introduction of commercial mushroom cultivation technology.



Dr. Shrestha emphasized the importance of exploring wild mushrooms as a source of new bioactive compounds with potential therapeutic value. He presented findings from his ethnomycological survey, demonstrating the traditional uses and local names of mushrooms such as Mirge Chyau (*Lentinula* spp.) and Dudle Chyau (*Lactarius* sp.), the latter of which is noted for being consumed even in its raw form.

Sharing his antimicrobial studies, Dr. Shrestha discussed the preparation of mushroom extracts and their testing against common infectious skin pathogens using minimum inhibitory concentration (MIC) value. He also presented results of Brine Shrimp Lethality Assay (BSLA), revealing that *Laetiporus sulphureus* (Kharani chyau) was non-toxic, Turkey tail mushroom (*Trametes versicolor*) showed weak toxicity but strong antimicrobial activity, and *Morchella* sp. (Guchhi chyau) exhibited the highest toxicity.



Glimpses of the Presentation

Concluding his plenary address, Dr. Shrestha highlighted his team's goal of developing mushroom-based antimicrobial products targeting skin pathogens. He expressed his sincere gratitude to the Ministry of Education, Science and Technology of Govt. of Nepal, his collaborators and the event organizers for the support and opportunity to share Nepal's growing research in mushroom science with an international audience.

Mountains in the Changing World

Forest Biomaterials for Sustainable Development Symposium

By -Dr. Sabina Shrestha and Binita Silwal

7th International Conference on Mountains in the Changing World (MoChWo 2025) was successfully held on October 10–11, 2025, at Hotel Himalaya, Lalitpur. The event was organized by the Kathmandu Institute of Applied Sciences (KIAS) with Madan Bhandari University of Science and Technology (MBUST) as one of the key co-organizers. Dr. Saurabha Bhattarai, coordinated for the Forest Biomaterials for Sustainable Development symposium during the conference.

The conference convened scientists, academicians, policymakers, and professionals from a range of disciplines to discuss mountain-specific challenges amid changing climatic, ecological, and socio-economic contexts. The program featured over 60 oral presentations, 30 poster presentations, and multiple panel discussions. Participants represented national and international institutions from Nepal, India, Canada, the United States, Bhutan, and other countries.

MBUST maintained a vibrant presence throughout the event. Academic Advisor Prof. Dr. Sanjay Nath Khanal, faculty members Dr. Bhushna Shrestha, Dr. Sabina Shrestha, Dr. Saurabha Bhattarai, Dr. Kishor Timsina, Dr. Sarbesh Das Dongol, and Mr. Binod Adhikari from administration represented the university, alongside several students.

On the first day, student posters showcased research on mushrooms, plant-based food colorants, bamboo, and kiwi, presented respectively by Mr. Atmaz Kumar Shrestha, Mr. Mukesh Maharjan, Mr. Sushil Rai, and Ms. Ankita Nepal. The second day featured oral presentations by students Ms. Sabnam Subedi, Ms. Binita Silwal, Mr. Birendra Mahara, and Mr. Nilkantha Regmi on their ongoing research projects.

Dr. Sarbesh Das Dongol delivered a compelling presentation titled “Genome editing of Nepali rice cultivars to develop blast-resistant rice lines” during the session on Molecular and Genomic Insights for a Sustainable Future. He highlighted the importance of integrating biotechnology, molecular breeding, and field validation to develop disease-resistant, high-yield cultivars adapted to local agro-ecological conditions. Dr. Dongol also chaired the session “From Genome to Landscapes: Understanding and Managing Biological Invasions in the Era of Anthropocene.”



MoChWo 2025, MBUST participation



The Forest Biomaterials for Sustainable Development symposium was hosted by Madan Bhandari University of Science and Technology, received special attention. The symposium emphasized the role of forest resources in achieving sustainable economic growth through innovation in biomaterials, value addition, and eco-friendly technologies. The session was chaired by Dr. Sabina Shrestha, Associate Professor, MBUST.

The session commenced with presentation of Dr. Saurabha Bhattarai, who introduced MBUST's vision, mission, and academic journey of MBUST. He provided detailed insights on the university's Forest Biomaterials Science and Engineering program, its research laboratories, collaborations, and its emphasis on an applied learning environment Dr. Bishnu Acharya from the University of Saskatchewan, Canada, delivered the keynote speech on "Utilization of Forest Biomaterials for Economic Development of Nepal."

The latter half of the session, including a panel discussion, was chaired by Prof. Sanjay Nath Khanal. Mr. Santosh Mani Nepal, Chairman of BAKAS Renewable Energy Limited and former Senior Director, Policy and Outreach at WWF Nepal, presented on "Transforming Forest Wealth into National Prosperity." Prof. Khanal then moderated a panel discussion with experts including Dr. Rameshwor Adhikari of RECAST, Tribhuvan University; Dr. Soni Baral from the Institute of Forestry, Tribhuvan University; Mr. Raj Kumar Malla of the Federation of Forest Based Industry and Trade, Nepal (FenFIT); and Dr. Sabina Shrestha of MBUST. The discussion addressed critical issues surrounding forest utilization.

The Best Oral Presentation Award – Graduate Category was awarded to Ms. Binita Silwal for her research titled "Green Treatment to Improve Resistance of *Bambusa nutans* and *Bambusa balcooa* Against Fungal Degradation and UV Exposure".

The symposium received partial sponsorship from Lekali Analytics and Laboratory Trade Concern and Green Bamboo Creation."



Dr. Sarbesh Das Dongol presenting on genome editing of Nepali rice cultivars



Ms. Sabnam Subedi presenting on study of antagonistic effect of native rhizobacteria against Clubroot



Green treatment to improve resistance of against fungal degradation and UV exposure in bamboo



Birendra Mahara presenting on lighting effects on growth of nutrient-rich indigenous crops Jumli Marsi, Proso millet, and Finger millet





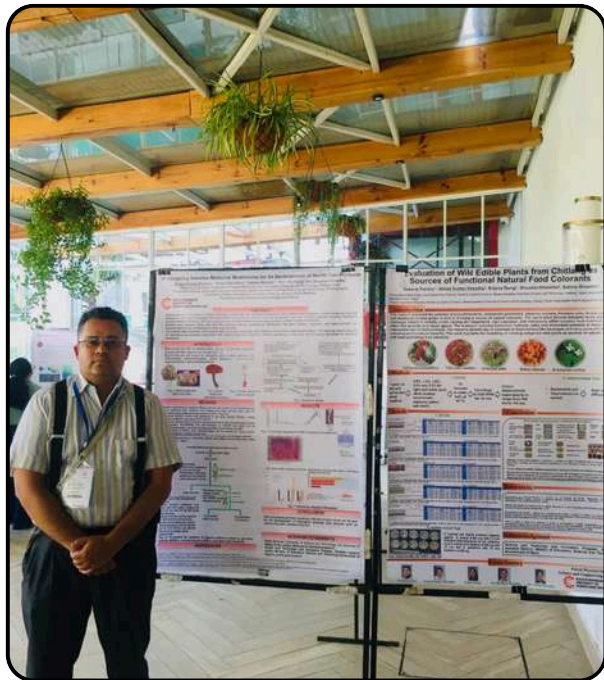
Mr. Nilkantha Regmi presenting on umerical optimization of openings in stone masonry homestays



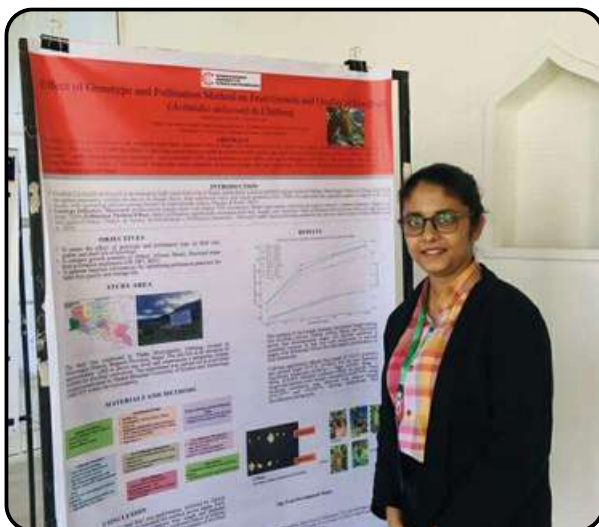
Ms. Binita Silwal receiving best oral presentation award – Graduate Category.



Mr. Mukesh Maharjan presentation on bamboo research



Mr. Atmaz Kumar Shrestha presentation on mushroom and food colorants



Ms. Ankita Nepal presentation on Kiwi research



Forest Biomaterials for Sustainable Development symposium



Top: Dr. Saurabha Bhattarai engaging with participants and addressing their queries.
Bottom: Mr. Santosh Mani Nepal presenting on 'Forest Wealth into National Prosperity'.



Top: Engaging panel discussion in progress.
Bottom: Panelists and some of the participants of 'Forest for National Development: Transforming Forest Wealth into National Prosperity'.

The Future is Fungi

Lessons from Malaysia

By- Saugat R.C.

As a research student of Master of Applied Sciences (MAS), Organic Agriculture Program, MBUST, I attended 2-day Mushroom Science Virtual 2025, an exciting annual symposium organized by the Malaysian Society for Biochemistry and Molecular Biology Special Interest Group (MSBMB-SIG): Mushroom Science and found the second day very insightful, especially the Plenary Session II delivered by Mr. Boey Tze Zhou, Chief Executive Officer of Fungitech Sdn. Bhd., Malaysia. His talk, entitled “*Navigating the Malaysian Mushroom Industry: Market Trends, Challenges, and Innovation*” provided a fascinating look into how Malaysia is shaping its mushroom sector to meet modern demands.

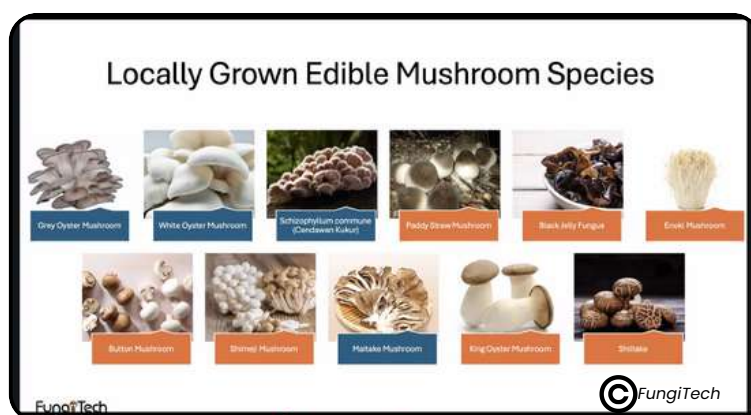
Mr. Zhou began by discussing the steady rise in Malaysia’s mushroom market, which is projected to grow at a CAGR of 5.78% over the next eight years. I was intrigued to learn that oyster mushroom (*Pleurotus* spp.) dominates cultivation there, while species like Split gill mushroom (*Schizophyllum commune*), Enokitake (*Flammulina velutipes*), Black jelly mushroom (*Auricularia* sp.), Paddy straw mushroom (*Volvariella volvacea*), Shimeji (*Lyophyllum shimeji*), Maitake (*Grifola frondosa*) and Shiitake (*Lentinula edodes*) are also popular: many imported from China due to cost advantages. It was also interesting to note that Reishi mushroom (*Ganoderma lucidum*) stands out as Malaysia’s primary cultivated medicinal mushroom.

He shared that modern consumers are becoming more health-conscious and increasingly drawn to plant-based diets, a trend also emerging in Nepal. However, Malaysia still faces significant challenges: limited technology adoption, low productivity and high production costs. Mr. Zhou explained many oyster farms still operate without proper environmental control, leading to drastic yield drops during the hot season, sometimes as low as 10 percent compared to rainy months.

One of the most engaging parts of his presentation was the discussion on innovative technologies like evaporative cooling systems and vacuum cooling. The former offers a more affordable alternative to air conditioning by optimizing oxygen levels, while the latter helps maintain mushroom freshness after harvest, a technology that has greatly improved mushroom quality in China. These practical solutions really resonated with me, especially considering the similar environmental challenges faced by mushroom growers in Nepal.



Flyer of the event highlighting the plenary speakers of Mushroom Science Virtual 2025



Mr. Boey Tze Zhou presenting the various mushroom species cultivated in Malaysia.



Mr. Zhou also touched on what he called the “mushroom wars” between imported and local products, noting the need for heat- and pest-resistant strains and more professional spawn suppliers. To support local producers, he suggested the introduction of import taxes on foreign mushrooms, similar to measures implemented in Korea, Japan, and Taiwan. For example, when South Korea imposed an import tax on fresh mushrooms, China responded by exporting mushroom substrates instead. In recent years, South Korea has extended the tax to include these substrates as well, effectively protecting and strengthening its domestic mushroom industry.

I particularly appreciated his mention of the FAO’s slogan, “One Meat, One Vegetable, One Mushroom,” which emphasizes the importance of including mushrooms as a staple for balanced nutrition. This idea could be equally valuable for promoting mushroom consumption and awareness in Nepal.

Towards the end of his talk, Mr. Zhou highlighted the vast opportunities in functional mushrooms and mushroom-based innovations like mushroom leather and eco-packaging. With Malaysia’s rich biodiversity, suitable climate and affordable raw materials, he envisions the country as a future mushroom substrate hub for ASEAN. He also introduced the creative use of empty fruit bunch fiber to improve substrate properties, something that could inspire similar sustainable approaches in our local context.

The session concluded with a strong call for collaboration among growers, researchers, government agencies and international institutions: a message that felt especially relevant to me as a Nepali researcher exploring the potential of our own native mushroom species.

Mr. Zhou ended with a memorable quote from Prof. Shu-Ting Chang that beautifully captured the essence of the session:

“Without leaves, without buds, without flowers, yet they form fruit; as a food, as a tonic, as a medicine – the entire creation is precious.”

Listening to his presentation not only deepened my understanding of the Malaysian mushroom industry but also inspired me to envision how Nepal, too, can harness its biodiversity and traditional knowledge to develop a more sustainable and innovative mushroom sector.



Mr. Zhou showcasing a photo of himself with oyster mushrooms grown in a controlled environment.



A look at the evaporative cooling system used at Fungitech Sdn. Bhd., designed to optimize growing conditions

The Things We See Every Day

Until Curiosity Teaches Us to Look Deeper

By- Nawaraj Pandey

There are so many things we grow up seeing, handling, and using that become part of our routine-habits, so normally we never truly notice them. For me, it was the process of manually cold-pressing oil in my village. As a child, I often stood near the old wooden press while my parents fed the seeds, turned the handle, and collected the oil we used at home. It felt ordinary, just another household activity. The elders taught the younger ones the steps but never explained why each step mattered. Maybe that's why I found it a bit boring back then. This was true not only for *Prinsepia utilis* (**Dhatelo, ढटेलो**) but also for other seeds like pumpkin and walnut.

Years later, I stood before that same process again, this time as a researcher. My mother crushed the seeds using a stone tool called **Silo** to remove the outer seed coat (Testa) and the inner coat (Tegmen). Then, she separated the kernels using a **Supo or Nanglo**. I learned that this step is crucial for oil quality because the tegmen contains cyanogenic glucosides, which can release hydrogen cyanide.

Watching each drop form, I felt a deep sense of connection. Science didn't take me away from tradition it brought me back to it with a clearer understanding. It reminded me that science isn't only about labs, equations, or machines. Sometimes, it begins in small village corners in the warmth of a stone press, the rhythm of hands, and the things we've always seen but never really noticed.



Manual separation of the outer and inner seed coats



Top: Grinding the kernels into powder
Bottom: Sieving the powdered kernels



Next, the kernels were crushed using a musal inside an Okhal (a stone pit). The powder's texture had to be just right. "If the powder is too coarse, it won't absorb water properly. But if it's too fine, the water can't enter easily," my mother explained. Her words carried simple but precise science. Before pressing, the heavy stone unit was gently heated by burning wood beneath it. After that, it was cleaned with hot water. We often think cold-pressed oil means no heat at all, right? But here, the warmth only touched the stone slightly, never the seeds. "It helps the oil flow better," mother said. That little bit of warmth made the pressing smoother without harming the oil's natural nutrients. During the pressing stage, known as Kolyaune (कोल्याउने), they added mild hot water to the crushed seed powder. They said, "The amount of water the powder drinks is the same amount of oil it gives." That simple line amazed me and imagine it is the kind of poetic version of chemistry at work. After about twenty minutes of steady pressing with the Musal and Okhal, golden drops of oil began to appear a sign of patience, skill, and generations of knowledge.



Before oil pressing: Heating the Okhal (stone mortar)



Top: Pressing the powdered Prinsepia seeds
Bottom: Collected pressed oil

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