

CONFERENCE PROCEEDINGS

10th INTERNATIONAL CONGRESS ON ADVANCES
IN BIOSCIENCE AND BIOTECHNOLOGY
(ICABB 2026)



AKSARAY UNIVERSITY, TÜRKİYE
SEPTEMBER 2026

Oral & Poster Presentations Collection

Organized by
ESBioTech
EURASIAN SOCIETY FOR BIOTECHNOLOGY

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Editors

İlker Camkerten

Hesham A. El Enshasy

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PREFACE

Research is the cornerstone of societal progress and scientific innovation. The **10th International Congress on Advances in Bioscience and Biotechnology (ICABB 2026)**, held on Aksaray, Türkiye, serves as a premier international platform bringing together academic scholars and industry professionals to exchange research results, foster interdisciplinary synergy, and catalyze innovation across life sciences and health technologies.

The **Eurasian Society for Biotechnology (ESBioTech)** is an international scientific association dedicated to connecting biotechnology communities across Eurafroasia. Driven by its core commitments to foster scientific collaboration, advance research-driven education, and promote science outreach for the betterment of humanity, ESBioTech organizes high-impact congresses (ICABB, ICAVST), publishes peer-reviewed research in the *Journal of Advances in VetBio Science and Techniques (VetBio Journal)*, and hosts specialized applications workshops.

Objectives:

- **Academic Platform:** To provide a world-class peer-reviewed forum for sharing innovative research findings.
- **Research to Education:** To integrate cutting-edge research outputs into academic curricula for student benefit.
- **Global Impact & Dissemination:** To address critical scientific challenges and facilitate high-quality publication in indexed journals and proceedings.
- **Constructive Feedback:** To offer collaborative review processes that enhance research quality, relevance, and global application.

ICABB 2026 Congress Summary

This milestone edition convened participants representing 7 countries: Algeria, Indonesia, the United Kingdom, Malaysia, Egypt, Oman, and Türkiye. Out of 65 registered scientific submissions, the Scientific Committee selected 31 peer-reviewed papers for formal presentation, comprising 29 oral and 2 poster presentations. **Ten oral** presentations were given by participants **from Turkey**, whilst **19 oral** and **2 poster** presentations were given by participants from **outside Turkey**.

We express our profound gratitude to our distinguished plenary and keynote speakers: **Prof. Dr. Hesham A. El Enshasy, Prof. Dr. Ida Idayu Muhamad, Prof. Dr. Mona Elsayed Aboutabl, Prof. Dr. Dayang Norulfairuz Binti Abang Zaidel, Dr. Mohamed A. A. Abdelhamid, and Assoc. Prof. Dr. Ernesto Hernandez** for their invaluable contributions to the scientific program.

Special appreciation is extended to the members of the Organizing and Scientific Committees, ZENITH Group support team, and each individual author and delegate whose dedication made this congress a resounding success.

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● ORAL PRESENTATION | 01

BioEconomy of Antibiotic and Anti-infective Industries: Current and Future Trends

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Abstract: Antibiotics and anti-infectives are important components and an integrated part of human health care industries. Their purpose is to reduce the risk of human pathogens by their killing (Cidal) or stopping the growth (static) effect to prevent colonization of microbes as the first stage for causing diseases. Since their discovery and commercialization in the 1930s, antibiotics play an important role in saving lives of more than hundreds of millions of people. It has been reported that if antibiotics were not used in the treatment protocols during the second world war, the victims could be tripled. Antibiotics are biological metabolites mainly produced by microorganisms which have the capacity to inhibit the growth of microbes when applied at low concentrations (which differentiate it from other anti-infectives). However, based on the extensive uses of antibiotics in medical and non-medical uses, new classes of pathogens have been developed, which has the capacity to resist the antimicrobial effects of antibiotics. Additionally, most of the currently used antibiotics and anti-infectives cannot differentiate between the human natural microbiome (mainly probiotics) which play an important role in human health and other pathogens. Thus, they kill the first protection layer of our body which is very important for a vital life. Therefore, current research focuses on the development of a new class of natural anti-infectives which have the capacity to differentiate between pathogenic and non-pathogenic microbes and are able to inhibit the growth of antibiotic-resistant microbes as well. This orientation keynote lecture will provide an overview of the recent development of novel and selective anti-infectives and shows how this new group of metabolites can change the bioeconomy of the anti-infective market.

Keywords: Antibiotics, Antimicrobial Resistance, Selective Anti-infectives, Human Microbiome, Natural Antimicrobial Metabolites

• ORAL PRESENTATION | 02

Gluten-immobilized yeast, lactic acid bacteria starter cultures improve the physicochemical properties, antioxidant capacity, and volatile profiles of fermented cocoa beans

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Abstract: The quality of Indonesian cocoa beans is constrained by inconsistent on-farm fermentation, and immobilized starter cultures offer a route to a more reproducible and better-controlled process. Across two complementary studies we evaluated gluten-immobilized yeast and lactic acid bacterium consortia (*Pichia kudriavzevii* UNJCC Y-137 and *Pichia manshurica* UNJCC Y-123), each applied singly and in combination with *Lactiplantibacillus plantarum* NP-57, for their effects on the physicochemical characteristics, antioxidant activity and volatile profiles of fermenting cocoa beans. Cells were adsorbed onto wheat gluten pellets for 3, 6 and 9 h and assessed by viable cell enumeration and scanning electron microscopy; fermentations followed factorial completely randomized designs comprising an uninoculated control, each single culture and the co-culture, sampled over 0–120 h in triplicate. Nine hours of immersion gave the most effective immobilization, with viable loads of $6.67 \times 10^8 \pm 4.7 \times 10^7$ CFU mL⁻¹ for *P. kudriavzevii*, 7.8×10^8 CFU mL⁻¹ for *P. manshurica* and $2.5\text{--}2.52 \times 10^9$ CFU mL⁻¹ for *L. plantarum*, and dense colonization of the pellet surface. Microbial treatment and fermentation time significantly affected bean physicochemical properties ($P < 0.05$). The co-cultures consistently outperformed the single cultures, reaching $85.67 \pm 2.73\%$ and $88.33 \pm 0.66\%$ fully fermented beans and $86.04 \pm 0.16\%$ and $81.74 \pm 0.22\%$ radical-scavenging activity, whereas *P. manshurica* alone gave the highest bean-mass temperature (34.57 ± 0.18 °C) and bean pH under the co-culture fell progressively to 4.78. Gas chromatography-mass spectrometry showed organic acids, alcohols, aldehydes, esters, amines, alkaloids and ketones, with acetic acid, 2,3-butanediol and 3-methylbutanal most prominent where *L. plantarum* was present. Gluten-based immobilization of yeast and lactic acid bacterium consortia therefore improves fermentation uniformity, antioxidant activity and the formation of flavour-related volatiles, although the pronounced terminal acidification of the co-culture calls for monitoring during scale-up.

Keywords: Cocoa bean fermentation, Cell immobilization, Gluten pellet, *Pichia kudriavzevii*, *Pichia manshurica*, *Lactiplantibacillus p*

● ORAL PRESENTATION | 03

Engineering Functional Biomaterials for One Health: Integrating Food, Human Health and Circular Bioeconomy

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Abstract: The growing challenges of food insecurity, environmental pollution, and human health require engineering solutions that recognize the interconnectedness of food systems, people, and the environment. This is consistent with the One Health concept, which calls for multidisciplinary approaches to address global sustainability challenges. This keynote presents the evolution of functional biomaterials engineering from biopolymer research to the development of sustainable materials for food, health, and environmental applications. Recent work on renewable agro-resources demonstrates how agricultural biomass can be transformed into functional biomaterials for active and intelligent packaging, controlled delivery systems, and biodegradable composites, adding value to biological resources while reducing reliance on fossil-derived materials. The presentation also proposes an Agro Functional Biomaterials Engineering (AFBE) approach, integrating biomass valorization, material design, process engineering, and application development to advance sustainable solutions across food, human health, and the environment. Rather than treating food, health, and the environment as separate domains, AFBE emphasizes their integration through functional biomaterials designed for sustainable applications. The keynote concludes by discussing future directions in green processing, digital technologies, and interdisciplinary collaboration to accelerate the development of engineering functional biomaterials that contribute to resilient food systems, improved human well-being, and a circular bioeconomy.

Keywords: *Engineering Functional Biomaterials, One Health, Circular Bioeconomy, Agricultural Biomass, Sustainable Materials*

• ORAL PRESENTATION | 04

Optimization Process for Enhancing Glucomannan Quality and Reducing Calcium Oxalate in *Amorphophallus* sp.

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Abstract: Glucomannan extracted from *Amorphophallus* tubers is a valuable dietary fiber and hydrocolloid widely utilized in food, pharmaceutical, and biodegradable material applications. However, its industrial utilization is severely constrained by the presence of calcium oxalate, which induce irritation, compromise product safety, and pose risks of kidney stone formation. Effective pretreatment is therefore essential to enhance glucomannan quality while reducing oxalate contamination. Conventional chemical and thermal methods frequently induce hydrolytic cleavage of thermolabile glucomannan chains, degrading the gelling functionality of the flour. To overcome these constraints, this study evaluates an optimized bioprocessing framework integrating microwave-assisted technique and low-temperature dehydration. Among emerging approaches, microwave pretreatment and freeze-drying have gained increasing attention as complementary, energy-efficient, and environmentally sustainable technologies. Microwave irradiation promotes rapid volumetric heating, facilitating cell disruption and enhancing the release of bound polysaccharides and oxalates, yielding an optimized 70% reduction in calcium oxalate while maintaining a pristine glucomannan content above 85%. In contrast, freeze-drying preserves polymer integrity and structural functionality through sublimation-based dehydration under mild conditions. Validations using Fourier Transform Infrared (FTIR) spectroscopy and Scanning Electron Microscopy (SEM) confirmed that this optimization process effectively disrupts toxic crystalline networks without compromising macromolecular linkages. This study critically examines the underlying mechanisms, effects on physicochemical properties, and synergistic integration of these techniques. Key challenges related to process optimization, scalability, and energy consumption are discussed, alongside future research directions aimed at advancing sustainable glucomannan processing.

Keywords: Optimization, Glucomannan, Calcium Oxalate, *Amorphophallus* sp.

Funding / Acknowledgements: This study is supported by Ministry of Higher Education Malaysia and Universiti Teknologi Malaysia (Q.K130000.4643.00Q41)

● ORAL PRESENTATION | 05

ANTICANCER REGULATION of Simpor Extract (*Dillenia Suffruticosa*) against MCF-7 Cell line

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Abstract: Cancer is a disease caused by abnormal cells growth. Breast cancer has been widely known as the most case in Indonesia. Natural therapeutic agents are continuing to be improved as they could inhibit the development of cancer cells without causing detrimental effects. Simpor (*Dillenia suffruticosa*) with local name of Simpor in Indonesia, is one of the plants found abundantly in Belitung Island. It has many prominent benefits as traditional medicines to cure diseases as well as traditional use by local people for food wrap. This analyze the cytotoxicity effect of Simpor leaf extract (SLE) on cell growth and its induction on apoptotic event of MCF-7 breast cancer cells line. Experimental method with variation on concentration of the leaf were applied. Analysis on SLE functional group was done with FTIR. Cytotoxic analysis was identified by D-MEM subculture followed by apoptotic investigation with Flow Cytometry Annexin V/FITC. Result suggests that SLE contains the functional groups O – H, C – H, C = O, C – O, and C – C of flavonoid, tannin and saponin. The cytotoxicity properties of the SLE were obvious shown by changes in cell morphology of the cell line such as shrinkage, nuclear compaction, membrane blebbing, and apoptotic bodies. Highest apoptotic of SLE on MCF-7 breast cancer cells was found on 25 ppm by 62.9%. Secondary metabolites found in SLE has good capacity to inhibit the growth of MCF-7 breast cancer cells through the apoptotic mechanism. This finding suggests that Simpor might further investigate as candidate for breast anticancer natural remedies

Keywords: *Natural, simpor, cytotoxicity, apoptotic, cancer*

Funding / Acknowledgements: DPPM KEMENDIKTISAINTEK National Research Grant of Regular Fundamental Research nu. 16/UN39.14/C3/DT.05.00/PFR/PL/2026

• ORAL PRESENTATION | 06

Phytochemical study and biological valorization of date palm kernel extracts (Phoenix dactylifera L.)

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Abstract: Algeria, owing to its diverse ecological and climatic conditions, harbors a rich flora that includes numerous fruit tree species. In the context of agro-industrial by-product valorization, the present study aimed to investigate the chemical composition and biological potential of methanolic extracts obtained through different extraction methods, as well as lipid extracts derived from the seeds of two Algerian date palm (*Phoenix dactylifera* L.) varieties, namely Ghars and Degla Beida. Two extraction techniques were employed, namely Soxhlet extraction and maceration. Phytochemical screening, quantification of secondary metabolites (total polyphenols, flavonoids, and tannins), gas chromatography–mass spectrometry (GC–MS) analysis of oils, and the assessment of antimicrobial activities (antifungal and antibacterial) were carried out. The extraction results revealed significant variations between the studied varieties. Ghars exhibited the highest Soxhlet extraction yield (6.97%), whereas Degla Beida showed the highest maceration extract yield (11.76%) and oil yield (7.72%). Phytochemical screening confirmed the presence of several bioactive secondary metabolites, with compositional differences between the two varieties. Ghars was characterized by higher contents of polyphenols and flavonoids in Soxhlet extracts, while Degla Beida contained a greater amount of tannins. In contrast, maceration extracts of Degla Beida exhibited higher flavonoid and tannin contents, whereas Ghars showed a superior polyphenol concentration. GC–MS analysis did not reveal any distinct exploitable chromatographic peaks, suggesting the absence or very low abundance of volatile and semi-volatile compounds in the analyzed oil samples. Antimicrobial assays demonstrated that the oils exhibited limited antifungal activity against *Fusarium* spp. and no activity against *Verticillium* spp. Conversely, methanolic extracts displayed notable antifungal activity against both fungal genera, in addition to appreciable antibacterial activity against *Escherichia coli*. No antibacterial activity was detected in any of the oil samples. Collectively, these findings highlight the considerable potential of date palm seeds as a valuable source of bioactive compounds with antifungal and antibacterial properties. Their exploitation may offer promising opportunities for the development of natural products and value-added applications in the pharmaceutical, food, and cosmetic sectors.

Keywords: *Phoenix dactylifera* L.; date palm seeds; secondary metabolites; phytochemical composition; antimicrobial activity; extraction; o

Funding / Acknowledgements: Department of Plant Biology, Faculty of Nature and Life Sciences, University Constantine 1 algéria

• ORAL PRESENTATION | 07

Novel Microbial Biocatalyst for Enhanced Biodegradation of Endocrine-Disrupting Chemicals

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Abstract: Endocrine-disrupting chemicals (EDCs) are emerging pollutants that pose a serious and persistent threat to water quality due to their chemical stability, ability to bioaccumulate, and potential to cause long-term adverse effects on ecosystems and human health. These contaminants, which include pharmaceuticals, personal care products, and industrial chemicals, are not effectively removed by conventional wastewater treatment processes, resulting in their continuous release into aquatic environments. In this study, we developed a novel microbial biocatalyst system that utilizes immobilized esterase enzyme to significantly enhance the biodegradation of EDCs. The esterase enzyme was genetically engineered to enable efficient and affinity-based immobilization on silica support, which ensures high enzyme stability, prolonged operational lifetime, and multiple cycles of reuse. To optimize the degradation performance, Response Surface Methodology (RSM) was applied to systematically evaluate the effects of pH, temperature, enzyme concentration, and contact time on the removal efficiency of representative EDCs. The optimized biocatalyst system demonstrated superior degradation efficiencies, achieving substantial reductions in EDC concentrations under laboratory conditions. Furthermore, application to real wastewater samples confirmed the practical applicability and robustness of the system in complex matrices containing various organic and inorganic constituents. Overall, this study highlights the significant potential of esterase-enzyme-based microbial biocatalysts as sustainable, efficient, and environmentally friendly tools for mitigating the impact of EDC pollution in aquatic ecosystems, offering a promising alternative to conventional treatment technologies.

Keywords: Endocrine-disrupting chemicals; Biodegradation; Microbial biocatalyst; Enzyme immobilization

• ORAL PRESENTATION | 08

Genetic diversity of Algerian durum wheat landraces assessed by SSR markers

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Abstract: Durum wheat (*Triticum durum*) landraces in Algeria represent valuable reservoirs of adaptive alleles for breeding under Mediterranean and Saharan-edge conditions. Here we assess genetic variation among 22 Algerian durum wheat accessions using ten SSR (WMC) loci to inform conservation and breeding strategies.

Twenty-two locally named accessions were genotyped at ten WMC microsatellite loci (Wmc96, Wmc97, Wmc327, Wmc327.1, Wmc182, Wmc156, Wmc261, Wmc238, Wmc233, Wmc168, Wmc257) using allele size scoring from gel data. Allele presence and size variation were tabulated per accession and used to estimate basic diversity metrics (allele counts, polymorphic information content, observed allele size ranges) and to infer genetic relationships among accessions.

All examined loci showed allele-size polymorphism across the 22 accessions, with multiple alleles per locus indicated by distinct fragment sizes in the dataset (example: Wmc96 alleles 0 / 237 / 305 observed among accessions). Several landraces (e.g., Tazi Tamantit, Omrokba Tamantit, Bahamoud Badriane variants) display distinct multilocus profiles suggesting both unique genetic identity and shared alleles consistent with regional exchange or common ancestry. Preliminary tabulation indicates loci with high allele-size ranges (for example, Wmc327 and Wmc261 show multiple size classes) that would yield moderate-to-high polymorphism useful for population structure and diversity analyses.

SSR genotyping evidences appreciable genetic diversity within Algerian durum wheat landraces, supporting their value for in situ/ex situ conservation and as sources of allelic variation for breeding programs targeting resilience to abiotic stress. Further analyses (e.g., allele frequency calculations, PIC, Nei's diversity, AMOVA, and neighbor-joining or STRUCTURE-based clustering) are warranted to quantify population structure and guide parent selection in breeding pipelines.

Keywords: Durum wheat, Algeria, SSR, microsatellites, genetic diversity, landraces

• ORAL PRESENTATION | 09

Osteosynthesis of a Rostral Segmental Maxillary Fracture Using a Mini Titanium Locking Plate in a Dog

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Abstract: Maxillary fractures are less common than mandibular fractures and are predominantly caused by trauma. Clinical signs may include malocclusion, epistaxis, facial deformity, and pain; surgical stabilization may be required in cases involving instability, malocclusion, or disruption of the integrity of the oral and nasal cavities. This case report aimed to present the surgical treatment of a rarely encountered rostral segmental maxillary fracture in a dog using a mini titanium locking plate.

The case involved a 6-month-old, female, Labrador dog presented to the Surgery Clinic of the Faculty of Veterinary Medicine, Aksaray University. According to the history obtained from the owner, although the exact cause of the trauma was unknown, the lesion was reported to have possibly resulted from a traffic accident or from biting the rim of a vehicle wheel. Oral examination revealed malocclusion and fracture lines between the right maxillary canine (104) and third incisor (103), and between the right first incisor (101) and left first incisor (201). The segment containing the right maxillary incisors was displaced craniodorsally, with gingival laceration and ulceration of the labial mucosa, and tooth 104 was found to be fractured. The findings were confirmed by lateral and intraoral radiographs.

Teeth 103, which was associated with the fracture line, and 104, which was fractured, were extracted. A Kirschner wire was placed as a reduction pin, followed by fracture stabilization using a three-hole mini titanium locking plate and two screws after achieving complete anatomical reduction. The gingival flap was closed with 2/0 polypropylene sutures, while the ulcerative lesion on the labial mucosa was debrided and primarily closed. During the short- to mid-term follow-up conducted by telephone, no complications were reported, and the patient was reported to be in good clinical condition.

This case suggests that tooth extraction may be necessary to achieve adequate stabilization with mini titanium locking plates in the surgical treatment of rostral segmental maxillary fractures. A comprehensive assessment of the fracture location, its relationship with the dental structures, segmental displacement, and malocclusion is important for determining the appropriate surgical approach.

Keywords: Dog, maxillary fracture, osteosynthesis, mini titanium plate, maxillofacial trauma.

• ORAL PRESENTATION | 10

Potential Use of Toll-Like Receptor 2 Agonists as Vaccine Adjuvants in the Prevention of Bovine Mastitis

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Abstract: Mastitis is the inflammation of the mammary gland and represents the most prevalent and economically significant disease affecting dairy cattle. Worldwide, the disease affects approximately 25–40% of cows, while in Turkey its prevalence is estimated at around 30%. In Turkey, mastitis most commonly occurs in its subclinical form, presenting without overt clinical signs. Gram-positive bacteria, particularly *Staphylococcus aureus*, are considered the principal causative agents, while Gram-negative pathogens, also contribute to the etiology of mastitis. The widespread and injudicious use of antimicrobial agents in the treatment of mastitis has led to antimicrobial resistance (AMR). This situation has once again underscored the need for prevention-oriented strategies rather than antimicrobial treatment-based approaches. The aim of this study is to evaluate the potential of TLR2 agonists as vaccine adjuvants, which bridge innate and adaptive immunity, as an alternative to the use of antimicrobial agents, based on the current literature.

TLR2 forms heterodimers with TLR1 and TLR6, activating NF-κB through the MyD88-dependent signaling pathway and inducing the production of proinflammatory cytokines such as IL-1β, IL-6, and TNF-α. Studies conducted in mice using synthetic TLR2 agonists such as MALP-2, Pam2Cys, Pam3Cys, and their Upam derivatives have demonstrated that these molecules enhance both cellular and humoral immune responses. Recently discovered adjuvant candidates such as VLA-15 and XS15 have yielded promising results in various infection models, indicating that TLR2-targeted approaches are progressing toward clinical application.

In conclusion, the economic losses caused by mastitis and the rising prevalence of AMR have made the development of new prevention-oriented strategies imperative. The use of TLR2 agonists as vaccine adjuvants stands out as an innovative and sustainable approach to the prevention of mastitis, owing to its potential to enhance the immune response against Gram-positive pathogens. However, further studies are needed to translate this potential into vaccine strategies applicable under field conditions.

Keywords: Mastitis, Toll-like receptor 2, Adjuvant, AMR

● ORAL PRESENTATION | 11

Determination of the effects of in ovo administered di-isobutyl phthalate on the proximal tibial growth plate of chicken embryos

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Abstract: Phthalates are chemicals commonly used to soften, harden and make plastics flexible. These chemicals are frequently used in PVC production, building products, medical devices, cosmetics, food packaging, cleaning materials, disposable surgical gloves and children's toys. This study aimed to determine the possible effects of di-iso-butyl-phthalate (DIBP) in ovo administered at different doses to fertile chicken eggs at the beginning of incubation on tibia weight, length, and embryonic development of the tibial growth plate.

For this purpose, five hundred fertilized hen's eggs were used in this study. The eggs were randomly divided into five groups as control, vehicle-control and 50, 250 and 550 mg/kg DIBP group. Test solutions were injected into the air chamber of the eggs. The eggs were incubated under optimal conditions. The eggs were opened on the 20th days of incubation. Six embryos from each group were sacrificed by decapitation to obtain tibia tissue samples. Tibias were removed whole, muscle and connective tissues were dissected and weighed. Tibial length was measured with a digital calliper. The tibia tissues were fixed in 10% buffered formal saline, then decalcified in 5% EDTA and processed through a series of graded alcohol and embedded in paraffin. Sections were stained with haematoxylin-eosin and Safranin O staining. The histomorphometric analysis of the tibial growth plate were performed. The mean tibia weight and tibia length were significantly lower in 250 and 550 mg/kg DIBP treated groups when compared to the control and vehicle control groups ($p<0.05$). Measurements of the tibial growth plate showed that there was a significant decrease in the thickness of both the proliferative zone and transitional zone+hypertrophic zone in the DIBP-treated groups ($p<0.05$).

In conclusion, DIBP exposure can affect bone development. These results suggest that some skeletal deformities might be expected in the later stages of the post-hatch period in affected animals.

Keywords: DIBP, Chicken, Histomorphometry, Tibial Growth Plate

• ORAL PRESENTATION | 12

Investigation of Zoonotically Important Capnocytophaga and Pasteurella Species in the Oral Microbiota of Dogs in Aksaray Province

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Abstract: Capnocytophaga and Pasteurella species are zoonotic bacteria found in the canine oral microbiota and can cause clinical conditions in humans ranging from localized wound infections to life-threatening systemic diseases. This study aimed to determine the prevalence of these bacteria in clinically healthy dogs in Aksaray Province using culture and real-time PCR methods and to evaluate the associations between bacterial positivity and periodontal findings. A total of 84 dogs were included in the study. Oral swab and saliva samples were collected and analyzed using conventional bacteriological culture and real-time PCR. Plaque index and periodontal pocket scores were also evaluated. Culture analysis detected Capnocytophaga spp. in 2 (2.4%) samples and Pasteurella spp. in 13 (15.5%) samples. Real-time PCR identified Capnocytophaga spp. in 15 (17.9%) samples. Among the Pasteurella species, P. stomatis had the highest positivity rate and was detected in 54 (64.3%) samples, followed by P. canis in 25 (29.8%), P. dagmatis in 13 (15.5%), and P. multocida in 7 (8.3%) samples. A significant association was found between plaque index and P. stomatis positivity, while periodontal pocket score was significantly associated with P. multocida and P. dagmatis positivity (p<0.05). These findings indicate that clinically healthy dogs may serve as reservoirs for zoonotically important bacteria and that molecular methods provide a higher detection rate than culture, particularly for identifying Capnocytophaga spp. carriage.

Keywords: Dog, Capnocytophaga spp., Pasteurella spp., oral microbiota, real-time PCR, zoonosis

Funding / Acknowledgements: This study was supported by the Scientific Research Projects Coordination Unit of Aksaray University (Project No. 2025/008).

● ORAL PRESENTATION | 13

Microbiota and Immunomodulation

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Abstract: The gut microbiota is a highly dynamic system composed of various microorganisms—such as bacteria, archaea, fungi, and protozoa—that exist in commensal or mutualistic relationships with the host. These microorganisms perform various functions, including aiding in digestion, regulating the immune response, and providing protection against pathogens. Any disruption to the balanced composition of the microbiota—for whatever reason—that favors opportunistic pathogens is referred to as dysbiosis. In cases of dysbiosis, it is not only the gastrointestinal system that is affected; adverse effects can also be observed in various other systems of the body, particularly the immune system and metabolic functions. The widespread use of antibiotics in the treatment of dysbiosis, coupled with the resulting adverse effects on the microbiota and the growing severity of antibiotic resistance, has brought probiotics to the forefront as an alternative or supportive approach. Probiotics contribute to the rebalancing of the microbiota in cases of dysbiosis through three primary mechanisms: regulation of the microbiota composition, strengthening of intestinal barrier function, and modulation of the immune system.

Keywords: *Gut microbiota, immunomodulation, animal*

• ORAL PRESENTATION | 14

Incidental uterine hydrometra in an experimental female Wistar rat: a multimodal case assessment

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Abstract: Hydrometra is characterized by the noninflammatory accumulation of serous fluid within the uterine lumen. An incidental case was identified in a female Wistar rat assigned to the alpha lipoic acid I group of a doxorubicin study. Gross examination revealed marked uterine distension. Histopathological examination demonstrated abundant serous fluid within the uterine lumen accompanied by pressure associated endometrial and myometrial atrophy, with no inflammatory cell infiltration or other pathological lesions, confirming the diagnosis of hydrometra. Diff Quick stained vaginal cytology was compatible with a transition from late metestrus to diestrus. Hematological examination revealed leukopenia, lymphopenia, normocytic normochromic anemia, and thrombocytopenia. Serum Anti Müllerian hormone concentration was 2026.93 pg/mL and remained within the distribution observed in the corresponding treatment group. Native thiol, total thiol, and disulfide concentrations were 111.884, 865.2, and 376.66 µmol/L, respectively. Histopathologically confirmed hydrometra was therefore interpreted as an incidental reproductive tract lesion identified during the experimental protocol. This case underscores the importance of systematic evaluation and documentation of unexpected individual animal findings in laboratory studies, as occult reproductive pathology may complicate the interpretation of experimental endpoints. Although the lesion was detected during alpha lipoic acid and doxorubicin exposure, its occurrence in a single animal does not permit attribution to either experimental treatment.

Keywords: Anti Müllerian hormone, doxorubicin, Hydrometra, thiol disulfide homeostasis, Wistar albino rat

Funding / Acknowledgements: This study was supported by the Scientific Research Projects Coordination Unit of Aksaray University (Project No: 2025-061).

● ORAL PRESENTATION | 15

Histological and Histometric Investigation of the Spleen in Blind Mole Rat (*Nannospalax xanthodon*) (Rodentia: Spalacidae)

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Abstract: Blind mole rat (*Nannospalax xanthodon*) are subterranean rodents that have evolved adaptation to hypoxia, are long-lived, and resistant to cancer. The aim of this study was to examine the histological and histometrical structures of blind mole rat spleen. Six healthy *Nannospalax xanthodon* were used as material. Tissue samples taken from the spleen were processed by routine histological methods and then stained with Crossman's Triple, Hematoxylin Eosin and periodic acid Schiff (PAS) stain. The spleen is surrounded by capsules composed of connective tissue, and parts of the capsules extend into the spleen as trabeculae. Within the organ, the red pulp area could be distinguished from the white pulp, and the lymph follicles were clearly visible within the white pulp. Histometric measurements revealed that the thickness of the capsules surrounding the organ ranged from 8 to 23 μm . The average thickness of the capsules was measured as 15 μm . The average number of lymph follicles was found to be 2.33 in 1.05 mm². The average length and width of the lymph follicles were measured as 292 μm and 225 μm , respectively. In conclusion, *Nannospalax xanthodon* spleen detailed structural features have been revealed using histological methods. The histology of the spleen of *N. xanthodon* was similar to that of other rodents spleen, and the observed variations might be linked to the rodent species adaptation to living underground.

Keywords: Histology, Histometry, Spleen, Blind mole rat, *Nannospalax xanthodon*

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• ORAL PRESENTATION | 16

FISH-WASTE-DERIVED BIOFERTILIZER: A SUSTAINABLE STRATEGY FOR CIRCULAR ECONOMY APPROACH

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Abstract: Fish-processing activities generate substantial quantities of waste, including fish heads, bones, skin, scales, and internal organs. Although these materials are nutrient-rich, improper disposal can produce unpleasant odours, increase organic pollution, and result in the loss of valuable recoverable nutrients. Therefore, converting fish waste into biofertilizer has the potential to provide a circular and sustainable approach to nutrient management while reducing dependence on chemical fertilizers. Currently, agriculture relies heavily on chemical fertilizers, and their excessive use can contribute to nutrient runoff, soil degradation, and environmental pollution. Fish waste contains organic matter and essential plant nutrients, particularly nitrogen, phosphorus, calcium, and micronutrients, which can be recovered through processes such as fermentation, enzymatic hydrolysis, composting, or microbial bioconversion. These residues could be converted into nutrient-rich fertilizer products for agricultural use. The resulting fish-waste-derived biofertilizer may improve soil fertility and plant growth while supporting nutrient recycling. Further research is needed to develop fish-waste biofertilizers that are safe, stable, low in odour, and nutritionally consistent. This approach may reduce fish-waste disposal problems, lower dependence on synthetic fertilizers, and promote a circular bioeconomy in agriculture.

Keywords: Fish waste valorization; biofertilizer; circular economy; nutrient recycling; chemical fertilizer reduction

• ORAL PRESENTATION | 17

Effect of Different Light Treatment on Morphophysiological, Yield and Phytochemical Content of Arugula Microgreens

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Abstract: Microgreens are young vegetable seedlings harvested after the emergence and full development of cotyledon leaves, typically within 7 to 21 days of cultivation. They are widely recognized for their high nutritional value, rapid growth cycle, and abundance of bioactive compounds. Among various microgreen species, arugula (*Eruca sativa*) has gained increasing attention due to its distinctive flavour and rich content of antioxidants, phenolic compounds, and flavonoids that contribute to human health. Light quality is one of the most important environmental factors influencing plant growth, physiological responses, biomass production, and the accumulation of secondary metabolites. Therefore, the optimization of light conditions is essential for improving both the yield and nutritional quality of microgreens. This study evaluated the effects of different light treatments on the morphophysiological characteristics, yield, total phenolic content, and total flavonoid content of arugula microgreens. Arugula seeds were cultivated under four different LED light treatments, namely red, blue, white, and yellow light, in a controlled environment. Microgreens were harvested after 21 days of cultivation when the cotyledon leaves were fully developed. Morphophysiological parameters including plant height, hypocotyl length, leaf length, leaf width, chlorophyll content, and biomass accumulation were measured. Based on the experimental findings, the blue light treatment recorded the highest growth and yield metrics, producing a plant height of 12.46 ± 0.49 cm, a fresh weight of 52.17 ± 0.48 g, and the highest total chlorophyll content at 12.61 ± 0.02 mg/mL. Conversely, secondary metabolite accumulation was heavily favoured by the yellow light treatment, which yielded the highest total phenolic content (975.57 ± 80.04 mg GAE/g) and total flavonoid content (318.03 ± 15.70 mg QE/g). The findings of this study identify the most suitable light treatment for enhancing growth performance, yield, and phytochemical accumulation in arugula microgreens. These results may contribute to the development of efficient lighting strategies for controlled-environment agriculture and support the production of high-quality microgreens with improved nutritional and functional properties.

Keywords: Arugula microgreens; LED lighting; Secondary metabolites; Biomass yield

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• ORAL PRESENTATION | 18

Optimization of Wolffia sp. Cultivation Parameters for Enhanced Biomass Production as a Sustainable Poultry Feed Ingredient

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Abstract: Rising production costs of conventional poultry feed ingredients and growing demand for sustainable protein sources have increased interest in *Wolffia globosa* (watermeal duckweed) as a promising alternative feed ingredient due to its high protein content. Despite its rapid growth in natural environments, large-scale cultivation of *W. globosa* remains underdeveloped due to a lack of optimized cultivation conditions. This study optimized the cultivation of *W. globosa* by evaluating the effects of initial inoculum weight (IW, 40.0–60.0 g) and electrical conductivity (EC, 0.5–1.4 mS cm⁻¹) on biomass production (g) under controlled conditions using Response Surface Methodology (RSM) with a central composite design. The optimum cultivation conditions were an IW of 43 g and an EC of 1.0 mS cm⁻¹, resulting in a biomass yield of 25.19 g. The specific growth rate was 15.36% day⁻¹, the doubling time was 1.2 hours and productivity was 83.96 g m⁻² day⁻¹. These findings demonstrate that optimizing cultivation parameters under controlled conditions can significantly enhance *W. globosa* biomass production, providing a foundation for its large-scale cultivation and supporting its application as a sustainable ingredient in cost-effective poultry feed.

Keywords: *Wolffia globosa*, Response Surface Methodology, Biomass, Poultry Nutrition, Optimization

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• ORAL PRESENTATION | 19

Microbially produced inoculant accelerates lignocellulosic compost maturation through cooperative bacterial–fungal interactions

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Abstract: This study investigated the interaction between a newly established microbial consortium and spent mushroom substrate (SMS) as a model lignocellulosic material, highlighting the role of microbial communities in accelerating compost maturation. The impact of sequential-batch enrichment on microbial stability, enzymatic activity, and SMS decomposition efficiency was evaluated. Serial enrichment significantly enhanced cellulase activity, indicating improved lignocellulose degradation capability of the microbial consortium. Following 45 days of composting, consortium inoculation resulted in substantial increases in available phosphorus (P; 130.30%) and potassium (K; 77.63%), accompanied by an optimal carbon-to-nitrogen (C/N) ratio of 19.02, demonstrating accelerated SMS transformation into a mature compost product. Microbial community analysis revealed a dynamic restructuring of bacterial and fungal populations, with significant enrichment of beneficial Actinobacteria and Ascomycota associated with organic matter decomposition. Notably, lignocellulose-degrading microbial groups became dominant in the final compost, suggesting their active involvement in substrate degradation and nutrient mobilization. Predictive functional profiling further demonstrated that microbial consortium inoculation enhanced key carbohydrate metabolism pathways, including starch and sucrose metabolism, pyruvate metabolism, and butanoate metabolism, with predicted contributions of 93%, 90%, and 84%, respectively. Collectively, these findings demonstrate that a domesticated compost-based microbial consortium can effectively drive microbial succession and functional metabolic activities, enabling efficient SMS biovalorization into a nutrient-enriched soil amendment and providing a sustainable strategy for accelerating compost production.

Keywords: Spent mushroom substrate; sequential-batch enrichment; synthetic microbial consortium; metabolic function

Funding / Acknowledgements: The submission from UTM is eligible to get 50% registration fee.

• ORAL PRESENTATION | 20

Feed for Malaysian mahseer, *Tor tambroides* (Bleeker, 1854) Cultured in Captivity

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Abstract: The Malaysian mahseer, *Tor tambroides*, also known as ‘Kelah’ is one of the most valuable riverine fish in Southeast Asia. In addition to its food value, it is an important ornamental and sport fish. However, a massive increase in destructive invasion events caused by humans has rendered the natural habitats of *T. tambroides* increasingly unfeasible for its survival. The growing consumer demand for this fish's flesh has driven the emergence of Malaysian mahseer farms. In captivity, *T. tambroides* has a slow growth period, which increases the capital cost of fish farming. To address these issues, a comprehensive review of the current status and future perspectives of *T. tambroides* research is necessary. This review aims to emphasize the dire predicaments facing the species and provide constructive insights. We present an overview of past and current *T. tambroides* research, covering the fields of morphology, growth, feeding behavior, diet, and nutrition. Additionally, we include future recommendations and perspectives for the respective fields to highlight knowledge gaps that need to be addressed soon. We expect this review will help create sufficient attention and awareness to accelerate conservation endeavors and elevate the Malaysian mahseer fish farming industry to greater heights.

Keywords: *Tor tambroides*, Malaysian mahseer, feeding, nutrition

• ORAL PRESENTATION | 21

Quantitative Assessment of Histamine Accumulation in Malaysian Animal-Based Fermented Foods Using High-Performance Liquid Chromatography with Diode Array Detection (HPLC-DAD)

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Abstract: The accumulation of biogenic amines particularly histamine via microbial histidine decarboxylase activity in animal based fermented foods poses serious risks of scombroid poisoning and foodborne illness. This study quantitatively evaluated histamine levels in commercial Malaysian fermented food matrices (belacan, budu, pekasam, and cinalok) alongside fresh animal tissue samples using High Performance Liquid Chromatography with Diode Array Detection (HPLC DAD). Eleven commercial fermented samples and eight fresh tissue controls were extracted using 0.4 M perchloric acid (HClO_4), pre column derivatized with dansyl chloride at 40°C for 45 minutes, and resolved on a Zorbax Eclipse XDB C18 column (4.6×100 mm, 3.5 μm). Separation was achieved via gradient elution using 0.1 M ammonium acetate (pH 7.9) and acetonitrile at a flow rate of 1.0 mL/min with UV detection at 254 nm. The method demonstrated excellent linearity over 30 to 700 mg/kg ($R^2=0.993$), with histamine eluting at approximately 3.28 minutes. Quantified histamine concentrations in positive samples ranged from 44.2±0.9 mg/kg in fresh *Euthynnus* sp. to 570.3±0.4 mg/kg in commercial belacan. All tested belacan batches exhibited high histamine accumulation (355.8 to 570.3 mg/kg), far exceeding the safety thresholds set by Codex Alimentarius (100 mg/kg) and the US FDA (50 mg/kg). Conversely, histamine was undetectable in fresh chicken, mutton, prawn, squid, and select batches of budu, pekasam, and cinalok. These results confirm that HPLC DAD is a reliable tool for biogenic amine profiling and highlight an urgent need to standardize fermentation parameters to mitigate health risks in traditional commercial products.

Keywords: HPLC-DAD, Histamine Quantification, Fermented Seafood, Food Safety

• ORAL PRESENTATION | 22

Development and Optimization of HPLC Method for Lactic Acid Detection in Commercial Prebiotic

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Abstract: Lactic acid is an important metabolite produced during the microbial fermentation of prebiotic substrates and serves as a valuable biomarker for evaluating fermentation efficiency. Accurate determination of lactic acid is therefore essential for assessing prebiotic functionality and food quality. Although gas chromatography (GC) is widely used for organic acid analysis, the application of high-performance liquid chromatography (HPLC) for lactic acid determination remains relatively limited. This study aimed to develop and optimize an HPLC method for detecting lactic acid in prebiotic samples containing inulin and lactulose. Chromatographic separation was achieved using a reverse-phase C18 column coupled with a photodiode array (PDA) detector. The optimized chromatographic conditions employed 0.1% phosphoric acid in water/acetonitrile (95:5, v/v) as the mobile phase at a flow rate of 0.6 mL min⁻¹, with detection at 210 nm. Lactic acid was successfully detected at a retention time of 3.1 min, indicating that the optimized HPLC method is suitable for lactic acid determination in prebiotic samples. The developed HPLC method proved to be a reliable, cost-effective, and practical approach for routine lactic acid determination in prebiotic samples and food quality assessment.

Keywords: Lactic acid, High-performance liquid chromatography, Inulin, Lactulose, Prebiotics

• ORAL PRESENTATION | 23

Wheat Germ Stabilisation: Effects on Protein Profile and Nutritional Integrity

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Abstract: Problem: Wheat germ (WG), the most nutrient-dense part of the wheat grain, is a valuable source of proteins, lipids, vitamins, minerals, and bioactive compounds. However, its high lipid content and endogenous lipase activity promote rapid deterioration, limiting its shelf life and industrial utilisation. Thermal stabilisation can inhibit enzymatic activity, but excessive heating may negatively affect the nutritional and functional properties of proteins.

Objective: This study aimed to determine the optimal oven-heating temperature for stabilising WG while assessing its effects on protein profile and nutritional integrity.

Methods: WG samples were subjected to oven heating at 50, 60, 80, and 100 °C, while untreated WG stored at room temperature was used as the control. Stabilisation efficiency was evaluated by monitoring changes in fatty acidity during one month of storage. The effects of thermal treatments on WG composition were investigated using Fourier-transform infrared spectroscopy (FTIR), sodium dodecyl sulfate–polyacrylamide gel electrophoresis (SDS-PAGE), and ultra-fast liquid chromatography (UFLC) for amino acid analysis.

Results: Oven heating at 80 °C for 20 min was identified as the most effective treatment for WG stabilisation. The increase in fatty acidity was substantially reduced compared with untreated WG, indicating effective inhibition of lipase activity. FTIR analysis showed thermal effects while the main functional groups remained largely preserved. SDS-PAGE revealed only minor modifications in the protein profiles, suggesting good preservation of protein integrity. However, UFLC analysis indicated a slight reduction in the concentration of some amino acids following thermal treatment.

Conclusion: Oven heating at 80 °C for 20 min appears to be an effective and relatively gentle method for stabilising WG. It extends its storage stability while largely preserving its protein profile and nutritional integrity, offering a simple and cost-effective approach for the valorisation of wheat germ as a nutrient-rich food ingredient and dietary supplement.

Keywords: Wheat germ, Heat stabilisation, FT-IR, SDS-PAGE, UFLC, Proteins

• ORAL PRESENTATION | 24

From Allelopathic Biomass to Functional Soil Amendment: Optimizing Humification of Prosopis Wood through Fenton Oxidation, Response Surface Methodology, and Biological Validation

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Abstract: Prosopis species are among the most aggressive invasive woody plants in arid and semi-arid regions worldwide. Although originally introduced for fuelwood production, erosion control, and land rehabilitation, their rapid spread has resulted in ecological degradation, reduced agricultural productivity, loss of grazing areas, and increased management costs. At the same time, large quantities of lignocellulosic biomass generated from control programs remain underutilized. This study presents a sustainable approach for converting invasive Prosopis biomass into a value-added humic-like soil amendment through optimized Fenton oxidation.

A sequential experimental strategy combining Plackett-Burman screening, Response Surface Methodology (RSM) was employed to optimize the transformation process, and Murashige and Skoog (MS) tissue-culture was used for biological validation. The effects of pH, hydrogen peroxide (H₂O₂), and ferrous sulfate (FeSO₄) on humification were investigated using a Central Composite Design. Chemical transformation was monitored by UV-Vis spectroscopy at 257, 313, and 350 nm to track the conversion of phenolic compounds into quinone intermediates and humic-like substances. Quinone and humification indices were used to quantify treatment efficiency.

The results demonstrated successful conversion of allelopathic phenolics into humic-like materials through controlled oxidation and polymerization reactions. Response surface analysis revealed a ridge-type optimum, indicating that balanced reaction conditions were more effective than extreme operating parameters. The practical optimum was achieved at pH 4.5, H₂O₂ 6.4%, and FeSO₄ 0.175%. Comparative evaluation of two Prosopis species showed similar optimal conditions but different humification efficiencies, reflecting differences in biomass composition.

Biological validation using MS tissue-culture assays confirmed reduced phytotoxicity following treatment. Furthermore, soil application studies indicated the potential of the treated biomass to improve water-holding capacity, enhance soil organic matter, moderate alkalinity, regulate salinity, and support seed germination and early plant growth. The study demonstrates a circular-bio-economy pathway that transforms invasive biomass from an environmental burden into a multifunctional amendment for soil restoration, water conservation, and climate-resilient agriculture.

Keywords: Prosopis, humification, Fenton oxidation, response surface methodology, allelopathy, soil restoration, water-holding capacity, s

Funding / Acknowledgements: This study is supported in parts with Oman TRC and UTAS-sur internal research grant.

● ORAL PRESENTATION | 25

Deconstructing the Substrate: Component-Resolved Limits to the Anaerobic Valorisation of Lignocellulosic Biomass

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Abstract: Anaerobic digestion is increasingly a sustainable solution that converts diverse feedstocks into valuable products, including biogas fuel and nutrient-bearing digestate. However, anaerobic digestion of lignocellulosic biomass is routinely reported as numbers that conceal a heterogeneous reality: what the microbial consortium encounters is not a defined chemical but three structurally distinct polymers with radically divergent bioavailability, physically interlocked. Progress in the field has been constrained less by reactor engineering than by our habit of treating the substrate as a black box.

This keynote resolves that box into its components and discuss that usually the resulting ceiling is more chemical than operational. Digested mesophilically at 37 °C, oil palm empty fruit bunch yielded 258 mL_{CH₄} gVS⁻¹. In parallel, with acclimatised inoculum, standard cellulose, xylan and Kraft lignin returned methane yields of 360, 214 and approximately 2.6 mL_{CH₄} gVS⁻¹; the corresponding degrees of methanation were 88.6 %, 56.7 % and approximately 0.4 %, a span of more than two orders of magnitude across the three fibre components. Cellulose methane yield reached quasi-equilibrium between inoculum-to-substrate ratios of 2 and 4, with cumulative biogas plateauing at 647 mL_{biogas} gVS⁻¹. Beyond a point, neither additional inoculum nor a richer medium recovers what substrate structure withholds.

The lecture then asks the forward question. If the lignin fraction is functionally inert to methanogenesis, the strategic response is no longer residence time but architectural: targeted pretreatment, cascaded valorisation of that fraction and honest theoretical benchmarking of what any given feedstock can yield. Recognising a ceiling is not pessimism; it is a precondition for designing around it. Under a One Health frame, this matters because over-promised digester performance strands infrastructure and returns residues to the disposal routes digestion was meant to replace.

Keywords: Anaerobic digestion; Lignocellulosic biomass; Biochemical methane potential; Oil palm empty fruit bunch; Lignin recalcitrance;

Funding / Acknowledgements: This study is supported by SRIR at CCCU

• ORAL PRESENTATION | 26

Novel Therapeutic Perspectives for Hypertrophic Cardiomyopathy Management

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Abstract: Hypertrophic cardiomyopathy (HCM) is the most common heritable cardiomyopathy with a wide range of phenotypic expression. It is estimated to affect 1 out of 500 adults without a specific relation to geography, ethnicity, or sex. HCM is a typical disorder of a single gene inherited in an autosomal dominant manner. The pathophysiology of HCM is complex and involves varying degrees of septal thickening, mitral leaflet elongation, and subvalvular abnormalities. The different therapeutic strategies for HCM disease management includes pharmacological treatments that target abnormal cellular processes, procedural-surgical approaches that target structural abnormalities in HCM, as well as allele-specific gene silencing and gene-editing which target the genetic foundations of HCM. According to the symptoms and the disease stage, relevant pharmacotherapies should be approached. Since 1960, beta-blockers have remained the first-line therapy, while calcium channel blockers serving as alternatives. Further pharmacotherapies: late sodium current blockers (ranolazine, eleclazine, novel GS-967) for treating HCM-related angina and the metabolic modulator perhexiline targeted refractory angina, while renin-angiotensin-aldosterone system inhibitors, antiarrhythmics, statins, N-acetylcysteine, and oral anticoagulants treated HCM symptoms. The emergence of cardiac myosin inhibitors has revolutionized the treatment of obstructive HCM by directly modulating myosin ATPase activity, through reducing excessive cross-bridge formation and increasing myosin in super-relaxed state in patients with left ventricular outflow tract obstruction. Mavacamten, has demonstrated a significant reduction in the need for invasive septal reduction therapy. Furthermore, aficamten has recently demonstrated clinical superiority over metoprolol in Phase 3 trials, showing greater improvements in peak oxygen consumption and functional capacity. Beyond pharmacotherapy, novel gene based therapies TN-201, an adeno-associated virus serotype 9 (AAV9)-based gene replacement therapy delivering MYBPC3 to cardiomyocytes, is currently undergoing clinical evaluation. Finally, advanced, less invasive interventional techniques such as PIMSRA and SESAME offer breakthrough alternatives to directly target and ablate hypertrophic septal tissue. In conclusion, the continued integration of precision medicine strategies targeting molecular and structural mechanisms in HCM holds promise for more effective, individualized treatment and potential disease modification.

Keywords: Hypertrophic cardiomyopathy (HCM); beta-blockers; Cardiac myosin inhibitors; Gene replacement therapy; Septal Reduction Therapy

• ORAL PRESENTATION | 27

The Role of Intestinal Dysbiosis in Leaky Gut Syndrome

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Abstract: The relationship between the gut microbiota and the intestinal barrier system is an increasingly investigated topic in both human and veterinary medicine. A healthy gut microbiota performs essential functions such as digestion, nutrient absorption, short-chain fatty acid production, and colonization resistance against pathogens. Dysbiosis, defined as an imbalance in the gut microbial ecosystem, negatively affects intestinal barrier integrity, contributing to increased intestinal permeability and the development of “leaky gut.” Tight junction proteins, including claudins, occludin, and zonula occludens (ZO) proteins, are among the major components of the intestinal barrier.

As a result of dysbiosis, lipopolysaccharide (LPS), particularly derived from Gram-negative bacteria, activates the TLR4/NF-κB pathway and increases the production of pro-inflammatory cytokines such as TNF-α, IL-1β, and IL-6. This process promotes MLCK activation and disruption of tight junction complexes, further increasing intestinal permeability and creating a progressive inflammatory cycle. In contrast, short-chain fatty acids, particularly butyrate, produced by the gut microbiota contribute to the maintenance of intestinal barrier integrity.

Literature data indicate that dysbiosis is associated with intestinal barrier dysfunction, endotoxin translocation, and systemic inflammation. Serum zonulin measurement, the lactulose/mannitol test, FITC-dextran assay, TEER analysis, DAO measurement, and 16S rRNA sequencing are used as diagnostic and research methods. Probiotics, prebiotics, postbiotics, and barrier-strengthening approaches are among the potential therapeutic strategies.

Keywords: Gut microbiota, dysbiosis, leaky gut, intestinal permeability, intestinal barrier, tight junction, zonulin, butyrate

● ORAL PRESENTATION | 28

Biotechnological Innovations in Combating Zoonotic Threats and Antimicrobial Resistance: A One Health Perspective

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Abstract: Today, the interaction between human, animal, and ecosystem health faces severe biological security challenges. Approximately 60% of human infectious pathogens, 75% of emerging diseases, and 80% of potential bioterrorism agents are zoonotic. Compounding this threat landscape, antimicrobial resistance (AMR) represents a 'silent pandemic' projected to cause 10 million annual deaths by 2050 due to routine antibiotic misuse in livestock.

Within the 'One Health' philosophy, modern biotechnology offers critical countermeasures. Advanced vaccine platforms—including mRNA, recombinant subunit, reverse vaccinology, and DIVA systems—provide robust protection while safeguarding international agricultural trade. Complementing immunization, field-type diagnostics such as pen-side molecular tools, digital PCR, and metagenomics enable rapid onsite pathogen identification and early warning systems. To overcome multi-drug resistance, biological alternatives like bacteriophage therapy and antimicrobial peptides offer targeted action without cross-resistance.

Addressing these global threats requires breaking professional silos, standardizing transparent data networks, and establishing comprehensive legal and institutional One Health frameworks. Ultimately, investing strategically in preventative biotechnologies at the animal-environment interface is exponentially more economical and effective than managing global human health crises reactively.

Keywords: *One Health, Zoonotic Diseases, Antimicrobial Resistance, Biotechnological Innovations, Bacteriophage Therapy, One Health Law.*

● ORAL PRESENTATION | 29

Preparing for the Next Pandemic: Emerging Viruses, One Health, Climate Change, and Emerging Technologies

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Abstract: The emergence and re-emergence of viruses remain major threats to human and animal health, food security, and socioeconomic stability. Many emerging viruses originate at the interface of humans, animals, and the environment, where land-use change, increasing contact between wildlife and domestic animals, urbanization, global travel, biodiversity loss, and changing agricultural practices can create opportunities for viruses to cross species barriers. Climate change may further increase these risks by altering vector ecology, host–pathogen interactions, transmission seasons, and the geographic distribution of arboviruses and other climate-sensitive infections. At the same time, human-driven changes to wildlife habitats and the genetic evolution of viruses can facilitate adaptation to new hosts and contribute to the emergence of infections in both animal and human populations. In this context, the One Health approach provides an important framework for integrating veterinary and human medicine with environmental science, public health, and policy. The COVID-19 pandemic, including its impact on Türkiye, highlighted the importance of rapid and accurate diagnosis, effective public health communication, genomic surveillance, healthcare preparedness, equitable vaccine access, and national capacity for vaccine research and development. These experiences underscore the need for early warning and response systems that bring together human, animal, and environmental surveillance. Key priorities include establishing and strengthening research and development centres for viral diseases, including laboratories operating at biosafety levels 3 and 4, before new threats emerge. Equally important is building national capacity for vaccine research, production, and diagnostic development through sustained investment in trained personnel, laboratory infrastructure, essential equipment, validated vaccines and diagnostic assays, and reliable supply chains. Emerging technologies, including metagenomics, next-generation sequencing, artificial intelligence, point-of-care diagnostics, and synthetic biology, can further strengthen pathogen detection, risk assessment, vaccine development, and outbreak response. Building these capacities in advance will improve early detection, rapid response, and preparedness for future viral outbreaks and pandemics.

Keywords: *Emerging viruses, Genomic surveillance, One Health, Public health, Pandemic, Viral vaccine, Zoonotic diseases*

• POSTER PRESENTATION | 01

Molecular Valorization and diversity of Saharan Bread Wheat and Durum Wheat in Algeria.

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Abstract: Climate change and rising temperatures significantly threaten global cereal yields, making the valorization of desert wheat resources crucial for developing climate-resilient varieties. In this context, molecular studies utilized ten preselected SSR markers to assess the genetic diversity of local Algerian Saharan wheat resources, encompassing twenty-eight bread wheat (*Triticum aestivum* L.) genotypes and durum wheat (*Triticum durum* L.) accessions. For bread wheat, the SSR markers produced 20 alleles (100 to 400 bp), yielding an average Polymorphism Information Content (PIC) of 0.34 and an average observed heterozygosity (*H_o*) of 0.55. Molecular variance (AMOVA) revealed that 97% of the differentiation occurred intra-population. Statistical analyses (PCoA, NJ method, and STRUCTURE) grouped the genotypes into four major classes. Whereas, the molecular analysis of durum wheat identified 19 alleles with an average PIC of 0.32. AMOVA indicated that 73% of the variation was within individuals, while 17% was between individuals. Cluster and structural analyses identified two to four primary genetic groups, noting mixed traits in the "Manga" accession. Crucially, specific drought-resistance-associated markers, notably WMC327 and WMC238, were highlighted across the studies.

Corroborating previous morphological findings, these results establish the first comprehensive genetic fingerprinting of Saharan wheat resources in Algeria. By identifying the critical genetic diversity necessary for drought resilience, this combined research provides a foundational basis for future breeding programs aimed at securing yield stability and improving the sustainability of wheat production in challenging desert ecosystems.

Keywords: Biodiversity, climate change, SSR markers, *Triticum aestivum* L, *Triticum durum*

• POSTER PRESENTATION | 02

Differences in nodule and shoot development in forage pea and lentil are linked to the rhizobial genotype

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Abstract: The interaction of legumes with nitrogen-fixing bacteria results in the development of root nodules, in which rhizobia provide fixed nitrogen to their host legumes; in return, rhizobia receive nutrients and energy produced by the plant. This study evaluates the variability of symbiotic efficiency on growth of two cultivars of pea and lentil inoculated with 16 different rhizobial genotypes originating from sub-humid and semi-arid regions of eastern Algeria. The genotypes being defined by the combination of haplotypes characterized by rRNA intergenic spacer (IGS) and a nodulation gene marker (nodD region). Analysis of shoots and nodules is an effective method to examine plants growth. The results revealed that efficiency is linked to the rhizobial genotype. Shoot development of forage pea and lentil was affected by rhizobial genotype. On average, the strains of genotype originating from sub-humid zones were more effective than the strains of genotype originating from the semi-arid zone for both tested plants. A statistically significant interaction between cultivar and rhizobial genotype was only found for nodule number, size and biomass in forage pea. A low number of large sized nodules and high biomass of shoot characterized pea plants inoculated by rhizobial genotypes originating from sub-humid zones. The formation of nodules and nitrogen fixation are energy-consuming processes, where by legumes develop a minimal necessary number of nodules for an optimal growth. In conclusion, the inoculation of plants cultivated in a semi-arid soil with effective strains from a sub humid origin might be more beneficial under severe environmental.

Keywords: Rhizobial genotype, *Pisum sativum*, *Lens culinaris*, nodule development, shoot development.

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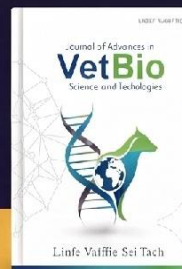


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