Book of Abstracts
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PLENARY SPEAKER

Id-33

Composition -Processing-Microstructure-Property Relationships of High Pressure Torsion Processed Zinc-Magnesium Alloys Targeted for Absorbable Biomedical Implant Applications

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Abstract: Absorbable metals have the potential to serve as the next generation of temporary medical implants by safely dissolving in the human body upon vascular tissue healing and bone regeneration. Their incorporation in the market could greatly reduce the need and risks associated with additional surgeries and other complications often related to permanent devices. Despite the extensive research on magnesium (Mg) and iron (Fe) based alloys over the last two decades, they have not exhibited an optimal combination of mechanical properties, biocompatibility, and controlled degradation rate for absorbable implant applications. Zinc (Zn) and Zn-based alloys have recently emerged as an alternative as they have demonstrated an attractive combination of *in vivo* biocompatibility and degradation behavior. However, their mechanical properties are generally insufficient for load-bearing implant applications. In this work, Zn-xMg (x = 3, 10, 30 wt.%) hybrid samples were synthesized for the first time using high-pressure torsion (HPT) to mechanically bond pure Zn and Mg disks. These samples were characterized to investigate their processing-microstructure-property relationships. The effects of HPT on the microstructural and hardness evolution were systematically studied in all the materials, with especial emphasis in the regions of highest plastic deformation. The effects of post-deformation annealing (PDA) on the Zn-3Mg hybrid were also investigated. In addition, an as-homogenized Zn-3Mg (wt.%) alloy was HPT-processed and subjected to PDA, and the microstructure and hardness evolution was compared with that of the Zn-3Mg hybrid. A significant microstructural refinement was obtained after HPT processing for 30 turns, reaching equiaxed grains of ~ 200 nm in both the Zn-3Mg hybrid and alloy. Unlike in the alloy, HPT induced the nucleation of Mg_2Zn_{11} and $MgZn_2$ intermetallic compounds, as well as the formation of supersaturated solid solutions in the hybrid, both of which led to maximum hardness values in the range of ~ 220-230 HV. PDA resulted in both an increased hardness (up to ~ 250 HV) and strain rate sensitivity. Overall, the insights gained from this research enabled a better understanding of the composition-processing-microstructure-property relationships of the Zn-Mg system and serve as a roadmap for the design of hybrid materials with enhanced mechanical properties.

Keywords: Zinc, Magnesium

PLENARY SPEAKER

Id-41

Tree Breeding: Transforming Sustainable Forest Management Through a Paradigm Shift

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Abstract: Global population growth, shrinking productive forest land, and accelerating climate change are converging to create unprecedented challenges for the world's forests. Meeting the increasing demand for timber, renewable biomaterials, and essential ecosystem services from a diminishing land base is no longer possible through traditional incremental improvements alone. It requires a fundamental paradigm shift in forest tree breeding. For more than half a century, genetic improvement in forest trees has been constrained by lengthy breeding cycles that require repeated rounds of selection, breeding (crossing), and field testing, often spanning decades. Today, advances in genomics offer the opportunity to fundamentally redefine this paradigm. By replacing time-intensive breeding processes with predictive, genome-enabled approaches, we can dramatically accelerate the delivery of superior planting stock while enhancing the resilience and productivity of future forests. In this presentation, I will highlight two transformative genomic strategies that challenge the traditional breeding framework. One strategy compresses the breeding cycle by bypassing the breeding phase, while the other reimagines the entire improvement pipeline by bypassing both breeding and field testing. Through case studies in two conifer species, I will demonstrate how these approaches deliver faster genetic gain, greater breeding efficiency, and more rapid deployment of improved germplasm. While developed in conifers, the concepts are broadly transferable to other forest tree species, offering a blueprint for the next generation of sustainable, climate-resilient forest breeding programs.

Keywords: Tree breeding, genomics, selection, genetic gain.

PLENARY SPEAKER

Id-46

Maternal Exposure to Polycyclic Aromatic Hydrocarbons (PAHs) Augments Neonatal Hyperoxic Lung Injury and Causes Dysbiosis of Gut and Lung Microbiome: Implications for Bronchopulmonary Dysplasia (BPD) in Premature Infants

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Abstract: Pregnant women exposed to polycyclic aromatic hydrocarbons (PAHs), which are present in the environment (e.g., cigarette smoke, diet, superfund sites) are at increased risk for premature delivery. Premature infants often require supplemental oxygen, a known risk factor for bronchopulmonary dysplasia (BPD). We hypothesize that prenatal PAH exposure exacerbates oxygen-mediated lung injury in neonatal mice, and that this effect is differentially altered in mice lacking the gene for (Cyp)1a1, 1a2, or 1b1. Timed pregnant wild type (WT) (C57BL/6J) mice were orally administered a PAH mixture of benzo[a]pyrene (BP) and benzo[b]fluoranthene (BbF) or the vehicle corn oil (CO) once daily on gestational days 16-19, and the dose response on postnatal lung injury was examined. In addition, timed pregnant mice with one of four genotypes, WT, Cyp1a1-null, Cyp1a2-null, and Cyp1b1-null, were treated orally with CO or PAH on gestational days 16-19 and exposed to hyperoxia or room air for 14 days. Lung injury was assessed on PND15 by radial alveolar count and mean linear intercept. Gene expression of DNA repair genes in lung and liver were measured. 16S rRNA sequencing was conducted in the intestine and lung, Results showed that hyperoxic lung injury is augmented by prenatal PAH exposure in a dose-dependent manner. This effect was differentially altered in the Cyp-null mice, with Cyp1a2-null showing the greatest extent of lung injury. PAHs also caused dysbiosis of gut and lung microbiome and these effects were altered differentially in various CYP knockouts. We concluded that newborn mice exposed to PAH in utero had more significant lung injury in response to hyperoxia than non-PAH exposed pups, and CYP1A1 and CYP1A2 are protective against lung injury while CYP1B1 augments lung injury. Furthermore, gut and lung microbiome appear to play a protective against lung injury. These results have important implications for bronchopulmonary dysplasia (BPD) in premature infants.

Keywords: Polycyclic aromatic hydrocarbons, preterm birth, bronchopulmonary dysplasia, neonatal lung injury, microbiome.

PLENARY SPEAKER

Id-52

One Health in Action: Dog Management and Rabies Prevention in Northern Manitoba, Canada.

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Abstract. Rabies is a quintessential One Health issue, existing at the intersection of human, animal, and environmental health. In northern Manitoba, Canada, Arctic fox–associated rabies presents ongoing challenges for public health, wildlife management, domestic animal health, and community well-being. Addressing this complex disease requires collaboration across sectors and disciplines, making rabies an ideal case study for demonstrating One Health in action.

After an outbreak of Arctic fox rabies in Churchill in 2022, a community-driven approach to rabies management began with engagement of residents, knowledge sharing, and a regional needs assessment. The collaborative approach shaped a 6-prong rabies risk reduction plan, which includes a rabies awareness campaign, dog lay-vaccination, wildlife oral rabies vaccination, dog safety education for children, wildlife deterrents, and ongoing collaboration with government and researchers.

Modelling efforts used to evaluate fox densities and Arctic fox-red fox interaction will be used to examine vaccination strategies in this northern ecosystem. An oral rabies vaccination (ORV) program in northern Manitoba has begun with placebo bait uptake studies and investigation into the acceptance of a bait station delivery method. A province-wide dog and cat lay-vaccination program has been developed for use in remote and Indigenous communities, and extra government grant funding has been provided to aid communities in developing and implementing dog population management programs. Preliminary results from these programs will be presented; highlighting successes, challenges, and future directions for rabies surveillance, vaccination strategies, and community-led disease prevention programs.

The core principles of One Health – transdisciplinary collaboration, meaningful stakeholder engagement, and integration of diverse knowledge systems – can generate effective and sustainable solutions for complex health challenges and are highly transferable beyond veterinary public health. Whether designing climate-resilient infrastructure, managing natural resources, improving public health, or preventing disease outbreaks, solutions are strongest when communities help define the problem and participate in creating the solution. Lessons learned from Manitoba's rabies initiatives offer valuable insights for researchers, practitioners, and policymakers working at the human–animal–environment interface across Canada and beyond.

Keywords: One Health, rabies, collaboration, engagement, dog management.

PLENARY SPEAKER

Id-55

Laser Photobiomodulation on Hard-To-Heal Ulcers in Frail Older Adults

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Abstract: Hard-to-heal ulcers in older adults are a challenging and complex condition. In a quasi-experimental project, we investigated three treatment approaches to hard-to-heal arterial leg ulcers in older adults (≥70 years): Photobiomodulation, conservative treatment and revascularisation. The purposes were to investigate the healing time, the importance of factors associated with healing and the 24 month recurrence of ulcers after healing with photobiomodulation.

Participants who received photobiomodulation (n = 51) were frail older adults recruited from municipal home healthcare and matched with participants who received revascularisation (n = 71) or conservative treatment (n = 153). The latter two groups were retrieved from the Swedish Quality Registry RiksSår for ulcer treatment.

Photobiomodulation was performed at wavelengths of 635 nm (targeting ulcer edges and area) and 904 nm (targeting lymphatic and ulcer areas), twice a week, with an interval of 3-4 days.

Table1. Laser Photobiomodulation characteristics

Laser type handpiece	12 GaAs laser diodes	4 GaAllnp laser diodes
Wavelength	904nm	635nm
Power output	60mW	75mW
Peak power output	25000mW	
Pulse frequency	700Hz	250Hz
Beam	divergent	divergent
Aperture diameter in contact application	5mm	9mm

The technical specifications refer to each laser diode. PBM equipment was Mid-Laser (Spectro Analytic Irradia AB, Fagerstagatan 9, 163 53 Spånga, Sweden).

The results showed that the photobiomodulation group had a significantly shorter healing time (p < 0.001) and a higher proportion of healed ulcers: 66.7% for photobiomodulation, 50.7% for revascularisation, and 41.2% for the conservatively treated group. The median healing times for the photobiomodulation group were 135 days (confidence interval 95–175), compared to 252 (confidence interval 181–323) and 316 (confidence interval 192–440), in the revascularized and conservatively treated groups, respectively. Neither ulcer duration nor other pretreatment factors exerted clinically relevant effects on healing time. In this study, recurrence within 24 months of healing with photobiomodulation was <12%.

In conclusion, photobiomodulation has the potential to heal hard-to-heal arterial leg ulcers markedly faster than revascularisation or conservative treatment. It could be a suitable treatment alternative for frail older adults, showing to be effective even in the presence of characteristics typically associated with prolonged healing. The non-invasive nature, low recurrence rate, and feasibility for use in home healthcare settings suggest meaningful clinical advantages over more invasive or resource-intensive treatment approaches.

The findings emphasise the value of long-term, real-world studies to determine the role of photobiomodulation in comprehensive wound care strategies for the population of older adults with frailty.

Keywords: Photobiomodulation, older adults, hard-to-heal ulcers, wound treatment.

PLENARY SPEAKER

Id-56

Two-Trace Two-Dimensional (2T2D) Correlation Spectroscopy In Early Medical Diagnosis

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Abstract. In recent years, Raman spectroscopy has proven to be an effective tool for analyzing macromolecules characteristic of living organisms. Raman spectroscopy is a rapid, non-destructive method that provides molecular information with minimal sample preparation requirements in a reproducible manner. This is a direct way of observation. The interaction of a beam of photons with their target molecules results in inelastic Raman scattering with an energy difference reflecting the specific chemical bonds and structure. This spectral fingerprint can indicate the identity of the target molecule. The spectrum is therefore a representation of the intensity values (dependent on the degree of polarizability change) as a function of the x-axis showing the Raman shift characteristic in the unit of wavenumber [cm^{-1}]. The wavenumber is the reciprocal of the wavelength and is therefore directly proportional to the photon energy.

Using the sensitivity and polarizability properties of biomarkers and the technique of confocal Raman microspectroscopy, we observed the process of lymphocyte activation after contact with the virus. It can therefore be said that the presence and concentration of immunoglobulins causes lymphocytes to be spectroscopically “labeled”. The activated form is “stained” by the 521 cm^{-1} band.

Lymphocytes activation during exposure to Epstein–Barr virus (EBV) was studied. Lymphocytes were obtained from patients treated for acute phase of infectious mononucleosis at the Jagiellonian University Hospital in Kraków. Complex changes in the averaged Raman spectra of lymphocytes during the treatment of patients on days 1, 3, 5, 9 and 12 of hospitalization were analyzed using the 2D-COS method. The dynamics of this experiment consisted in examining the averaged spectra of lymphocytes on the above-mentioned days of hospitalization. The cause of the observed changes was an external factor - time and, of course, the treatment carried out at that time. A 2D correlation spectroscopy experiment designed in this way was performed, using time as a relatively slow external perturbation in the system of interest. Generalized 2D correlation formally defines the intensity of synchronous and asynchronous correlation. 2D correlation is a quantitative comparison of the spectral intensity changes observed for two different spectral variables over a finite observation interval between T_{min} and T_{max}. The accepted convention is to treat 2D correlation intensity X (v_1, v_2) as a complex number consisting of two orthogonal components (i.e., real and imaginary), called the synchronous and asynchronous 2D correlation intensities, respectively. The synchronous 2D correlation intensity Φ (v_1, v_2) represents the overall similarity between two separate spectral intensity changes measured at different spectral variables when the value of t is changed. On the other hand, the asynchronous 2D correlation intensity

$\Psi(\nu_1, \nu_2)$, can be considered as a measure of the dissimilarity of the spectral intensity changes. It turned out that synchronous maps monitor the process of formation of receptor complex. Asynchronous maps indicate the development of Ig-secreting B cells during the immune response.

Another alternative analysis approach was undertaken. 2T2D correlation spectra were constructed solely from a pair of spectra. The asynchronous spectrum directly provides discriminating information. The two-trace two-dimensional (2T2D) correlation method was used to determine the differences between EBV-infected cells in the first hours of hospitalization and healthy cells. For the 785 nm excitation line, the presence of a phosphorylated tyrosine marker was detected, which provides important information regarding the activation state of white blood cells. Tyrosine vibrations generate a prominent cross-peak in the asynchronous map for the 514.5 nm excitation laser line.

The 2T2D correlation method of discrimination also allows for differentiation of tissue-related issues. Thus, the 2T2D method allowed us to understand the influence of the storage temperature of brain tissue on the analysis of the obtained spectra. Such examples will be discussed.

Keywords: Lymphocyte; Epstein–Barr virus (EBV); Raman spectroscopy; 2D-COS; 2T2D.

Acknowledgment: The study was supported by the research part of the subsidy of the Faculty of Chemistry of the Jagiellonian University in Krakow, Poland. The study was carried out using research infrastructure funded by the European Union in the framework of the Smart Growth Operational Program Measure 4.2; Grant No POIR.04.02.00-00-D001/20, “ATOMIN 2.0 – Center for materials research on ATOMic scale for the INnovative economy”.

PLENARY SPEAKER

Id-60

Mechanism of the Activation of HSV-1 DNA Replication

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Abstract: Herpes simplex virus type 1 (HSV-1) causes lifelong infections in human cells and is associated with a range of diseases. HSV-1 DNA replication requires seven viral proteins, including the major DNA-binding protein ICP8, the origin-binding protein UL9, and proteins that comprise the helicase–primase and DNA polymerase complexes. UL9 functions as a DNA helicase that specifically recognizes and binds to the viral origins of replication, OriS and OriL. Here we report the cryo-EM structure of the UL9/ICP8/DNA/ATPγS complex at an overall resolution of 3.18 Å. This structure revealed that UL9 employs an α-helix to separate the DNA strands and captures the initial step of OriS unwinding, in which the C-terminal domain of UL9 specifically binds to the major groove of a DNA double helix, while the N-terminal helicase domain engages the unwound leading and lagging strands. ICP8 interacts with the extreme C-terminal region of UL9, preventing UL9 dimerization. Simultaneously, it binds and stabilizes the leading-strand DNA adjacent to UL9. Together, these findings provide mechanistic insight into UL9-driven DNA unwinding and the cooperative action of UL9 and ICP8 at HSV-1 replication origins, establishing a structural framework for the rational interpretation of prior biochemical data and for the design of new antiviral drugs.

Keywords: Herpes Simplex Virus Type 1, DNA Replication, Origin Binding Protein UL9, ICP8, Cryo-EM.

INVITED SPEAKER

Id-40

Contribution of Endophytic Bacillus subtilis to Wheat Photosynthetic Performance and Growth Under Combined Drought, Salinity, and Heat

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Abstract. Combined abiotic stresses (CAS) are a major environmental challenge in global agricultural production, severely constraining the growth and yield of stable food crops such as wheat. As the area of land affected by CAS continues to expand, developing effective strategies to mitigate these stresses and enhance crop tolerance has become an urgent priority for food security. In recent years, plant growth-promoting endophytic bacteria (PGPEB), such as Bacillus subtilis, have attracted considerable attention as a promising eco-friendly strategy for improving crop resilience to abiotic stresses due to their beneficial properties and physiological regulatory functions. However, the mechanisms underlying their effects remain unclear, and most studies have focused on single stressors, leaving the impact of CAS largely unexplored. This study addresses this gap by evaluating the endophytic strain B. subtilis 10-4 (Bs) for its ability to improve growth, photosynthesis, and grain yield in two wheat cultivars with contrasting drought tolerance [tolerant cv. Ekada109 (DT) and sensitive cv. Zauralskaya Zhemchuzhina (DS)] under CAS (drought, salinity, and heat) in both pot and field experiments. Pre-sowing seed inoculation with Bs significantly improved growth parameters (linear dimensions, fresh and dry biomass, root system architecture) of DT plants under CAS, partially or completely offsetting their negative impacts. In contrast, the protective effect of Bs on DS plants was limited. Bacterial inoculation also reduced CAS-induced degradation of photosynthetic pigments chlorophyll (Chl) a and Chl b in both cultivars, with a stronger effect in DT plants. The priority data were obtained on the influence of Bs on Chl fluorescence parameters (Fo, Fm, Fv/Fo, Y(NO), Y(NPQ), qN, etc.) under combined drought, heat, and salinity. The photosynthetic apparatus of DT plants proved more resilient to both single stresses (drought, heat, salinity) and their combinations compared to DS plants. Bs inoculation normalized the light-phase processes of photosynthesis under most stress combinations, with the minimal effect observed under the salinity+heat+drought combination. These findings suggest that Bs application can improve photosynthetic electron transport efficiency in wheat, particularly in DT cultivar, and thereby help plants to cope with adverse CAS effects, leading to enhanced growth and grain yield under both laboratory and field conditions. Overall, this study provides new insights into the multifunctional role of

PGPEB B. subtilis 10-4 in wheat stress adaptation to CAS and lays the groundwork for developing microbial-based strategies to mitigate climate-driven agricultural losses.

Keywords: Endophytic bacteria; Bacillus subtilis; Combined abiotic stresses; Triticum aestivum; Photosynthesis; Stress resilience.

Acknowledgment: The study was supported by the grant of the Russian Science Foundation No. 25-16-00188, https://rscf.ru/en/project/25-16-00188/.

INVITED SPEAKER

Id-61

Natural Fibers for Sustainable Biocomposites: From Renewable Resources to Green Construction

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Abstract: The transition toward more sustainable materials has become a major challenge in the construction and materials sectors. In this context, the development of environmentally friendly building materials from renewable resources is receiving increasing attention. Gypsum-based biocomposites reinforced with natural fibers and/or cords represent promising alternatives to conventional materials such as concrete and steel. Their attractive combination of low density, low thermal conductivity, high flexural strength, and improved impact resistance offers significant potential for lightweight and energy-efficient construction applications. The reduced weight of these materials can facilitate transportation, handling, and installation, while their low thermal conductivity can contribute to reducing the energy required for heating and cooling buildings.

This plenary presentation focuses on the development and characterization of gypsum-based biocomposites reinforced with natural fibers, with particular emphasis on cactus fibers and sisal cellulose fibers. The study investigates the role of alkaline treatment using sodium hydroxide (NaOH) in improving the quality and performance of these natural reinforcements. A comprehensive set of analytical and mechanical characterization techniques was employed to evaluate the effectiveness of the treatment in removing impurities and modifying the properties of the fibers. Tensile testing demonstrated a significant increase in the tensile strength of the treated fibers, confirming the beneficial effect of the alkaline treatment on their quality. In addition, three-point flexural testing revealed a significant enhancement in the flexural strength of the gypsum-based composites. This improvement is attributed to enhanced matrix–fiber adhesion resulting from the optimization of the fiber-treatment conditions.

Overall, the findings demonstrate the considerable potential of alkali-treated cactus and sisal cellulose fibers as renewable reinforcements for the development of sustainable, lightweight, and high-performance gypsum-based biocomposites. The results also highlight the importance of tailoring fiber-treatment conditions and considering the intrinsic properties of natural fibers to maximize their contribution to composite performance. More broadly, this work illustrates how the valorization of renewable natural resources can support the development of environmentally responsible advanced materials, opening new perspectives for their integration into greener construction solutions and contributing to more sustainable approaches in materials engineering.

Keywords: Natural fibers, gypsum-based biocomposites, alkaline treatment**,** cactus and sisal fibers, sustainable construction.

POSTER PRESENTATION

Id-58

Endophyte-Induced Root Architectural Remodeling Drives Genotype-Specific Zn/Fe Biofortification In Wheat Under High-Moisture Field Conditions

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Abstract. Wheat (Triticum aestivum L.) feeds nearly 40% of the global population, yet its grain often lacks essential micronutrients, particularly iron (Fe) and zinc (Zn), contributing to widespread "hidden hunger". Biofortification offers a sustainable solution, and plant growth-promoting endophytic bacteria represent a promising tool. However, the root-level mechanisms driving genotype-specific responses under real field conditions remain poorly understood. Furthermore, most studies focus on water deficiency, while the efficacy under excessive soil moisture, an increasingly common extreme due to climate change, has received little attention. This study aimed to determine the effect of endophytic Bacillus subtilis 10-4 (BS) on root architecture and nutrients biofortification in wheat under field conditions. A field trial was conducted on leached chernozem in the Predural steppe zone (Russia) during the extremely wet season of 2025, characterized by excessive rainfall and high humidity throughout the second half of vegetation. Two spring wheat cultivars contrasting in dehydration tolerance (sensitive Zauralskaya Zhemchuzhina (ZZ) and tolerant Ekada 109 (E109)) were inoculated with BS (test) and non-inoculated (control). Root architecture (total root length (TRL), root volume (V), number of root tips (NRT), and branching factor (BF)) was assessed using RhizoVision 2.0.3 program; grain macro-/microelements (N, P, K, Zn, Fe, Cu) were quantified by atomic absorption spectroscopy. It was revealed that BS inoculation induced radical root architectural restructuring in ZZ: NRT increased 4.3-fold, TRL 2.8-fold, V 2.6-fold, and BF 2-fold. In contrast, E109 showed only moderate root stimulation (TRL +1.5-fold, V +1.6-fold, NRT +1.5-fold) with preserved architecture (BF +1.1-fold), indicating a qualitative genotype-specific difference. Grain P, Cu, and Zn concentrations increased in both cultivars following BS inoculation. However, Fe concentration increased significantly in BS-inoculated ZZ (+31–37%), having the most extensive root branching. The 4.3-fold proliferation of root tips (NRT) (the primary sites of Fe and Zn uptake) in ZZ directly corresponded to this unique Fe biofortification, whereas E109's preserved architecture failed to enhance Fe translocation to grain. Notably, the BS-induced root remodeling in ZZ was accompanied by a progressive biomass accumulation during the second half of vegetation, resulting in a grain yield gain of +13% compared to the non-inoculated control, while E109 showed no final yield advantage. This study demonstrates that BS-mediated biofortification is genotype-dependent and root architecture-driven. The dehydration-sensitive ZZ, which displayed radical root

restructuring, achieved both Zn and Fe enrichment with a concurrent yield gain, while the dehydration-tolerant E109 accumulated only Zn and Cu without significant changes in yield. Crucially, these findings were obtained under excessive moisture, revealing that root branching plasticity (not drought tolerance per se) is a key trait for successful endophyte-assisted biofortification. We propose that root tip proliferation in response to endophytes represents a promising selection trait for breeding programs and for designing genotype-specific inoculation strategies, irrespective of the water regime.

Keywords: Triticum aestivum; Bacillus subtilis; Root architecture; Biofortification; Genotype-specific response; Wet field season.

Acknowledgment: The study was supported by the grant of the Russian Science Foundation No. 25-16-00188, https://rscf.ru/en/project/25-16-00188/.

POSTER PRESENTATION

Id-66

Prospects for the Application of Chlorella Vulgarıs as a Biologically Actıve Feed Additive and Biofertilizer

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Abstract. The effectiveness of a modified *Chlorella vulgaris* suspension as a biologically active feed additive and biofertilizer for young cattle and quail, as well as for pre-sowing treatment of Beta vulgaris BORO F1 beet seeds, was studied. The microalgae were cultivated on a chemically modified Bogdanov medium containing FeNPs. A 17,5% increase in the average daily weight gain of calves and a 3,3% increase in the absolute live weight gain of quail were observed. The quail also demonstrated earlier egg production, increased egg weight, and increased protein content. Pre-sowing treatment of beet seeds increased germination energy from 30 to 54%, and laboratory germination from 74 to 94%. The results confirm the potential of using modified *Chlorella vulgaris* biomass in livestock and crop production.

Keywords: Microalgae, Chlorella vulgaris, iron nanoparticles, biologically active feed additive, biofertilizer.

All Submissions & Topics

Topic	Submission
Biomedical Sciences	Id-33 - Composition -Processing-Microstructure-Property Relationships of High Pressure Torsion Processed Zinc-Magnesium Alloys Targeted for Absorbable Biomedical Implant Applications
	Id-55 - Laser Photobiomodulation on hard-to-heal ulcers in frail older adults
	Id-56 - Two-Trace Two-Dımensıonal (2t2d) Correlatıon Spectroscopy In Early Medıcal Dıagnosıs
Genomics, Proteomics	Id-41 - Tree Breeding: Transforming Sustainable Forest Management Through a Paradigm Shift
Environmental and Agricultural Life Sciences	Id-40 - Contribution of Endophytic Bacillus subtilis to Wheat Photosynthetic Performance and Growth Under Combined Drought, Salinity, and Heat
	Id-46 - Maternal Exposure to Polycyclic Aromatic Hydrocarbons (PAHs) Augments Neonatal Hyperoxic Lung Injury and Causes Dysbiosis of Gut and Lung Microbiome: Implications for bronchopulmonary dysplasia (BPD) in premature infants
	Id-58 - Endophyte-Induced Root Architectural Remodeling Drives Genotype-Specific Zn/Fe Biofortification In Wheat Under High-Moisture Field Conditions
	Id-66 - Prospects For The Applıcatıon Of Chlorella Vulgarıs As A Bıologıcally Actıve Feed Addıtıve And Bıofertılızer
Microbiology and Infectious Diseases	Id-52 - One Health in Action: Dog management and rabies prevention in northern Manitoba, Canada
	Id-60 - Mechanism of the Activation of HSV-1 DNA Replication
Biotechnology and Bioengineering	Id-61 - Natural Fibers for Sustainable Biocomposites: From Renewable Resources to Green Construction