UNIVERSITY OF AGRICULTURAL SCIENCES AND VETERINARY MEDICINE CLUJ-NAPOCA

the 23rd INTERNATIONAL CONFERENCE
LIFE SCIENCES FOR SUSTAINABLE DEVELOPMENT
26-28 September 2024, Cluj-Napoca, Romania

BOOK OF ABSTRACTS

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”LIFE SCIENCES FOR SUSTAINABLE DEVELOPMENT”

26th – 28th September, 2024
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Sorina DÂRJAN, PhD

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Str. Mănăştur Nr. 3-5, Cluj-Napoca, 400372,România
Tel: +40 264.596.384 ext. 400 Fax: +40 264.593.792
E-mail: simpo@usamvcluj.ro

WELCOME MESSAGE

We are pleased to welcome you to the 23rd International Conference ”Life Sciences for Sustainable Development”, Romania to share our scientific performance and progress during this special scientific event.
The University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca, classified in the first category of “advanced research” universities of Romania, place also confirmed by the European University Association (EUA). The University becomes nowadays one of the most prestigious academic institutions from Romania.
The 23rd International Conference ”Life Sciences for Sustainable Development” is a dynamic forum of exchanges for scientific experiences, innovative ideas and concepts, future prospects in agriculture, plant and animal science, food science and technology, biotechnology, veterinary medicine, as well in other interdisciplinary and transdisciplinary areas.
The 23rd International Conference ”Life Sciences for Sustainable Development” includes invited conferences, presented by known international and national personalities, oral and poster presentations, where recent advanced scientific and technical results can be seen, especially now, in the context of the new European Research Program “Horizon 2020” and of the national Research – Technological Development and Innovation Program, related to Life Sciences.

The conference programme will consist of ten main sessions:

1. Agriculture
2. Environmental Protection
3. Food Science and Technology
4. Horticulture
5. Economics and Rural Development
6. Animal Science
7. Biotechnology
8. Veterinary Medicine - Fundamental and preclinical sciences
9. Veterinary Medicine - Clinical sciences
10. Geodesy, Forestry and Applied Exact Sciences

The participants registered to our conference have the opportunity not only to present their results, published as summary in the “Book of Abstracts” but also to publish in extenso their contributions. The oral presentations, after a previous peer review process, can be published in the journal Bulletin of UASVM-CN – Agriculture, Horticulture, Animal Science-Biotechnology, Veterinary Medicine, Food Science and Technology, and Forestry and Cadastre.

“Book of Abstracts” contain abstracts submitted by participants from different countries. We wish to thank all participants and organizers for making this meeting possible.

With best wishes,

Prof. Cornel CĂTOI, PhD
Rector

Prof. Vlad MUREȘAN, PhD
Vice-rector for Research, Development and Innovation

ANNOTATION

The abstracts and contact information are submitted by the main authors.
Each author explicitly confirms that the abstract meets the ethical standards for authors and coauthors.

CONFERENCE PROGRAMME

Thursday, 26th September 2024		
09:00 -11:00	**Registration of participants**	Hall - Aula Magna "Mihai Șerban", UASMV Cluj-Napoca
09:00 -11:00	**Poster Display** (*For more details, please see the program)*	
09:30-09:45	**Opening ceremony** Rector, Cornel CĂTOI Vice-Rector, Vlad MUREȘAN	Aula Magna "Mihai Șerban", UASMV Cluj-Napoca
09:45-12:40	**Plenary Session** Chairpersons: Sanda ANDREI, Cătălina DAN, Oana POP, Mignon SANDOR, Adriana URCAN Horia VLASIN	Aula Magna "Mihai Șerban", UASMV Cluj-Napoca
09:45-10:10	**LEARNING FROM INNOVATIONS IN EUROPEAN FARMING SYSTEMS: EVIDENCE FROM SUSTAINABILITY ASSESSMENTS WITH THE PUBLIC GOODS TOOL**	**LAURENCE SMITH** United Kingdom
10:10-10:35	**FARM ANIMAL WELFARE IN SUSTAINABLE DEVELOPMENT**	**JENNY YNGVESSON** Sweden
10:35-11:00	**PAPILLOMAVIRUS INFECTION IN RUMINANTS AND HORSES: NEW INSIGHTS AND FUTURE PERSPECTIVES**	**FRANCO ROPERTO** Italy
11:00-11:25	**FROM WASTE TO WEALTH : BIOCONVERSION OF XYLAN FROM SUGAR CANE BAGASSE INTO FUNCTIONAL XYLO-OLIGOSACCHARIDES (XOS)**	**MONTAROP YAMABHAI** Thailand
11:25-11:50	**YEAST'S CONTRIBUTION TO MELATONIN FORMATION FOR BOOST WINE'S NUTRITIONAL VALUE**	**Valeriu COTEA** Romania
11:50-12:15	**3D CADASTRE - A TOOL FOR FIT FOR PURPOSE LAND ADMINISTRATION**	**NIKOLA VUČIĆ** Croatia
12:15-12:40	**INTERNATIONAL COLLABORATION AND MULTILINGUALISM IN AGRICULTURAL SCIENCE – A SCHOLARLY JOURNAL EXAMPLE**	**ZVONIMIR PRPIC** Croatia
13:00 –14:30	***Lunch – Biodiversity Research Center***	
15:00-18:30	**Oral Sessions (sessions I-X)** *For more details, please see the program*	
19:00-24:00	**Gala Dinner *(Restaurant Wonderland Resort)***	
Friday, 27th September 2024		
09:00-12:30	**Poster Presentation and Evaluation** **Oral Sessions (sessions I-X)** *For more details, please see the program*	
12:30-13:00	***Break***	
13:00 –13:10	**Closing ceremony and Best Poster Awards**	Aula Magna "Mihai Șerban", UASMV Cluj-Napoca
Saturday, 28th September 2024		
08:30-21:00	**Post - conference tour (optional) - Transylvania** **Route: Alba-Carolina Citadel and Apoldia Vineyard & Winery Fest**	

LIST OF ABSTRACTS

ORAL PRESENTATIONS

SESSION 1 AND 2: AGRICULTURE AND ENVIRONMENTAL PROTECTION

LEARNING FROM INNOVATIONS IN EUROPEAN FARMING SYSTEMS: EVIDENCE FROM SUSTAINABILITY ASSESSMENTS WITH THE *PUBLIC GOODS* TOOL

Laurence SMITH[1]

[1]*School of Agriculture, Policy and Development, University of Reading, UK*
Corresponding author, e-mail: laurence.smith@slu.se

Introduction: Multi-criteria, indicator-based assessment tools can provide a useful framework for decision making within a range of agricultural systems. The Public Goods Tool (PG tool) represents one-such tool that was originally developed in 2010 to provide a comprehensive and systematic evaluation aid for the optimization of public goods provision in agriculture.
Aims: The aim of this research was to discuss *The Public Good Tool* as a method used to assess sustainability in agricultural systems and to identify key practices and system characteristics that affect performance.
Materials and Methods: We will describe the bottom-up stakeholder led process applied in the original development of the PG tool and results from its application in various projects in the European Research Area.
Results: The study provide an overview of more-recent developments to the PG tool that have taken place within the SLU-led, Horizon 2020 project PATHWAYS (Pathways for transitions to sustainability in livestock husbandry and food systems, https://pathways-project.com/). This ongoing work aims to improve the sustainability and innovative capacity of the European livestock sector through a comprehensive sustainability evaluation.
Conclusion: The Public Good Tool is a method that is able to successfully assess different area of sustainability.

Keywords: agricultural systems, indicators, sustainability, The Public Good Tool

BIOFUMIGATION WITH MUSTARD (*BRASSICACEAE*) CAN ALTER NITROGEN MINERALIZATION AND NITRIFICATION OF ORGANIC FERTILIZERS

Reshma RAMACHANDRAN[2] and Jake MOWRER[1]*

[1] *Faculty of Department of Soil and Crop Sciences, Texas A&M University, USA*
[2] *Graduate Student Department of Soil and Crop Sciences, Texas A&M University, USA*
*Corresponding author, e-mail: jake.mowrer@ag.tamu.edu

Introduction: Biofumigation with mustard (*Brassicaceae*) is a promising approach to managing pests in organic production systems. The practice is known to reduce root-eating nematodes, weed pressures, and plant pathogens. However, little is known about the effects of biofumigation on non-target soil organisms. Successful organic crops require nutrition. Nitrogen is the nutrient required in the largest amounts. Organic fertilizer commonly contains organic nitrogen (N_O), which must be decomposed (mineralized) by bacteria and/or archaea to the inorganic form of ammonium (NH_4^+) for plant uptake. Nitrification by bacteria and archaea produces nitrate (NO_3^-), another plant available form. Non-target effects of biofumigation with mustard on the organisms responsible for these two processes will affect plant availability of nitrogen for organic crops.
Aims: This experiment explored effects on the heterotrophic bacteria responsible for the mineralization of nitrogen from organic fertilizers and the activity of nitrifying communities. Plants may only take up their essential N nutrition as NH_4^+ or NO_3^- following the mineralization of organic N. If these organisms are inhibited or delayed, the delivery of N to organic crops will be compromised.
Materials and Methods: Three soils of contrasting physical properties were incubated with mustard meals and organic fertilizer. Soils were incubated at 23°C. Inorganic nitrogen (N_i) accumulation over a period of 100 days was measured as NH_4^+ and NO_3^-.
Results: The presence of mustard meals caused instances of decreased mineralization of organic N and delayed nitrification. This effect was interactive with soil type/texture.
Conclusion: This work demonstrates that use of mustard as biofumigant will have interactive effects on organic N mineralization and nitrification. These outcomes are dependent upon soil type and will require additional management considerations for organic growers when biofumigation is included in production systems.

Keywords: Biofumigation, Organic Crops, Nitrogen Mineralization, Nitrification

THE INFLUENCE OF THE USE OF GREEN MANURES ON THE ATTACK OF PATHOGENS ON WHEAT.

Peter-Balázs ÁCS[1*], Ioan PĂCURAR[1]

[1]*University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca*
*Corresponding author, e-mail: peter-balazs.acs@student.usamvcluj.ro

Introduction: Green manuring can play an important role in this regard as it showed versatile impacts like improvement of soil physico-chemical and biological properties and fertility, nutrient supply to succeeding crops, checking erosion and plant protection (Sagar Maitra et al. 2018).
Aims: The evaluation of the impact of green fertilizers, including their combinations with chemical fertilizers, on wheat diseases. A comprehensive evaluation was conducted to quantify the incidence and severity of fungal infections across three key anatomical zones of the wheat plant: the ear, leaves, and crown (the transition zone between the root and stem). The dominant fungal pathogens identified were Cladosporium spp. on the ear, Puccinia spp. and Septoria spp. on the leaves, and Pseudocercosporella spp. on the crown.
Materials and Methods: In this experiment, five plant species (triticale, peas, soybeans, sunflower, and rapeseed) intended for incorporation into the soil have been utilized. These will be sown during the summer and then incorporated into the soil at the green stage, before the optimal wheat sowing period. The experiment involves three repetitions, using the split-plot design with three experimental factors: factor A - green manure, factor B - chemical fertilizer, and factor C - fungicide treatment.
Results: This study investigates the potential impact of green manuring on fungal diseases in wheat. Three key anatomical zones (ears, leaves, and crowns) were assessed for disease incidence and severity following green manure incorporation. Data analysis is ongoing, but we anticipate green manuring treatments may influence the distribution and severity of fungal pathogens on the wheat plant.
Conclusion: The present study lays the groundwork for elucidating the impact of green manuring on fungal disease management in wheat. By evaluating disease incidence and severity across key anatomical zones, this research aims to contribute valuable insights for developing sustainable disease control strategies in wheat production. Further analysis will determine the effectiveness of green manuring and pave the way for future investigations into the underlying mechanisms.

Keywords: wheat, green manure, fungal diseases, disease management

References

1. Sagar Maitra, A Zaman, Tanuj Kumar Mandal and Jnana Bharati Palai. Green manures in agriculture: A review. J Pharmacogn Phytochem 2018;7(5):1319-1327.

THE INFLUENCE OF SOME TECHNOLOGICAL FACTORS ON THE PRODUCTION OF TRITICALE

Beniamin-Emanuel ANDRAȘ[1]* și Marcel M. DUDA[1]

[1]University of Agricultural Sciences and Veterinary Medicine, Calea Mănăștur, 3-5, Cluj-Napoca, România
*Corresponding author, e-mail: beniamin-emanuel.andras@student.usamvcluj.ro

Introduction: *Triticosecale* Wittmack results from the hybridization between *Tr. aestivum* and *S. cereale* taking from wheat the high production capacity and a high protein content and from rye the ability to adapt and resist biotic and abiotic stress factors (SOARE A., 2015). They make very good use of lands with low fertility and an acidic pH. It is especially used in poultry and pig feed for its high protein content.
Aims: The current study aims to establish the influence of technological factors on triticale production. We try to highlight the most important technological factors and their effect on production.
Materials and methods: The experience use split-plot experimental design, with three experimental factors: factor A – the variety (Negoiu, Utrifun, Zvelt, Tulnic), factor B – fertilization (chemical, foliar, biostimulator) and factor C – density of sowing (450, 550, 650 germinabil grains/m²). The soil type is a typical preluvosol, with low humus content and acidic reaction.
Results and discussion: Factor A had the greatest influence on production, being distinctly significantly positive. The influence of factor A on production resulted in the variety Tulnic having a distinctly significant negative difference. The influence of factor B on production shows that foliar and biostimulant fertilization show significantly negative differences. The influence of factor C on production did not show significant differences.
Conclusions: In the two years of the study, the technological factor that most influenced production was Factor A, with Utrifun having the largest production. The experimental variants fertilized foliar and with biostimulator registered significantly negative differences in 2021 and positive in 2022. The sowing density did not register significant differences in production in the two years of the study.

Keywords: experience, technology, triticale.

References:

1. SOARE A (2015)., „*Note de curs Fitotehnia cerealelor păioase și leguminoaselor pentru boabe*” Facultatea de inginerie Brăila, Specializarea Agricultură.

ASSESSING THE POTENTIAL FOR HYDROGEL PRODUCTION FROM FLAX SEEDS

Claudia BALINT[1], Antonia ODAGIU*[1], Petru BURDUHOS[1], Alexandra MUREȘAN[1]

[1] *Faculty of Agriculture, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca*
*Corresponding author, e-mail: antonia.odagiu@usamvcluj.ro

Introduction: Hydrogels are hydrophilic polymer capable of retaining large amounts of water, making them valuable in a variety of applications, including agriculture, medicine, and environmental management. Recent studies have explored natural sources for hydrogel production due to their biocompatibility and environmental sustainability (Gan et al., 2020). Flax seeds, known for their high mucilage content, present a promising raw material for hydrogel synthesis (Dhillon et. al., 2022).
Aims: The primary objective of this study is to assess the feasibility of producing hydrogels from flax seeds, focusing on their water retention capacity, mechanical properties, and potential applications. By exploring this natural source, the study aims to contribute to the development of sustainable and environmentally friendly hydrogels.
Materials and Methods: The study involved extracting mucilage from flax seeds, which was then processed to form hydrogels. Several experiments were conducted to evaluate the water retention capacity, swelling behavior, and mechanical properties of the hydrogels. The extraction process was optimized to maximize yield and functionality.
Results: The results indicate that flax seed-based hydrogels exhibit excellent water retention capacity and satisfactory mechanical properties, making them a viable alternative to synthetic hydrogels. The use of flax seeds not only provides an environmentally sustainable option but also enhances the potential for hydrogel applications in agriculture, where water management is crucial.
Conclusion: The study highlights the significant potential of flax seeds as a sustainable and effective raw material for hydrogel production. The superior water retention capacity and adequate mechanical properties of flax seed based hydrogels position them as a viable alternative to conventional synthetic hydrogels. Moreover, the utilization of flax seeds in hydrogel production aligns with the growing demand for environmentally friendly materials, contributing to sustainable development in various industries.

Keywords: flax seeds, hydrogel, mucilage, water management

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INNOVATIVE SOIL WATER RETENTION TECHNOLOGIES DURING DROUGHT: A REVIEW

Petru-Daniel BURDUHOS[1], Antonia ODAGIU*[1], Claudia BALINT[1], Bianca MOLDOVAN[1], Cristian IEDERAN[1], Ioan BRAȘOVEAN[1]

[1] *Faculty of Agriculture, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca*
*Corresponding author, e-mail: antonia.odagiu@usamvcluj.ro

Introduction: Droughts are increasingly recognized as a significant threat to global agriculture, exacerbated by climate change (FAO, 2020). Traditional water management practices often fall short in effectively conserving soil moisture during extended dry periods (Pereira et al., 2019). In response, innovative soil water retention technologies have been developed to mitigate the impact of drought on agricultural productivity.
Aims: The aim of this review is to critically assess the latest developments in soil water retention technologies designed to combat drought, specifically, seeks to: analyze the mechanisms by which these technologies improve soil moisture retention; evaluate the impact of these technologies on crop performance under drought conditions; identify the advantages and limitations of each technology in various agricultural settings.
Materials and Methods: This research is based on a comprehensive analysis of recent literature published within the last five years. Key databases, including Web of Science, Scopus, and Google Scholar, were searched using terms such as "soil water retention," "drought mitigation," "super absorbent polymers," "biochar," and "compost."
Results: The results summarize that super absorbent polymers are highly effective in retaining soil moisture, particularly in sandy soils, leading to significant improvements in crop yield during drought conditions. Biochar has been shown to improve soil structure and increase water holding capacity, especially in degraded soils. Compost and other organic amendments enhance soil organic matter, contributing to better water retention and nutrient availability.
Conclusion: Innovative soil water retention technologies hold considerable potential for mitigating the adverse effects of drought on agriculture. Super absorbent polymers, biochar, and compost each offer unique benefits, with varying degrees of effectiveness depending on environmental and agronomic factors. Future research should focus on optimizing the application methods, understanding the long-term impacts of these technologies on soil ecosystems, and exploring their economic feasibility for large-scale adoption.

Keywords: water management technologies, drought, soil moisture

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POLLUTANTS REMOVAL USING COST EFFECTIVE MATERIAL FROM APPLE WASTES

Alin CÂRDAN[1], Maria-Loredana SORAN[2*], Ildiko LUNG[2], Ocsana OPRIŞ[2], Adina STEGARESCU[2], Irina KACSO[2], Maria MIHEŢ[2], Alexandru TURZA[2], Dmitry LAZACOVICH[3], Aliona GHENDOV-MOŞANU[3], Rodica STURZA[3], Cristina MORMILE[4], Francesco MASCHIO[5], Fabio VENTURI[5], Alessio CALABRÒ[5], Stefano BELLUCI[5], Delia GLIGOR[1]

[1] *Faculty of Environmental Science and Engineering, Babeş-Bolyai University, 30 Fântânele, 400294 Cluj-Napoca, Romania*
[2] *National Institute for Research and Development of Isotopic and Molecular Technologies, 67-103 Donat, 400293 Cluj-Napoca, Romania*
[3] *Faculty of Food Technology, Technical University of Moldova, 9/9 Studenţilor Street, MD-2045 Chişinau, Moldova*
[4] *Faculty of Chemistry, University of Rome La Sapienza, P. le Aldo Moro 5, 00185 Rome, Italy*
[5] *RAIT88 srl, Via Nomentana 761, Roma, Italy*
[*]Corresponding author, e-mail: loredana.soran@itim-cj.ro

Introduction: Biochar is a charcoal rich in carbon, which gained attention due to its definite physio-chemical characteristics and applications in multiple fields, such as agriculture, climate change mitigation, environmental remediation etc. Thus, biochar nanocomposites are cost-effective and efficient adsorbents to meet the stringent quality criteria of healthy and pure water availability and also improving soil and water health as well as optimizing crops by sequestering heavy metals and herbicides from soil and irrigation waters.
Aims: The aim of this paper was the preparation and characterization of cost-effective new adsorbent materials based on biochar functionalized with metal oxides and biocompatible polymers (alginate) and preliminary tests for drugs and phthalates retention.
Materials and Methods: The biochar was obtained from apple by-products and was tested for drugs and phthalates adsorption from water samples. The best removal degrees (more than 90%) of paracetamol and ciprofloxacin from water were obtained in the case of the activated biochar (A-ac) and A-ac-Fe_3O_4 materials. In the case of tartrazine, the removal degrees were over 80% obtained with all the obtained materials. The concentration of pollutant used in all experiments was determined using UV-Vis spectrophotometry.
Results: The experimental results were obtained at 40 mg L^{-1} concentration of drugs, pH 2, 25°C, 20 min contact time and 1 g L^{-1} adsorbent dose.
Conclusion: The research brings information regarding the efficient adsorption of pollutant on biochar, which can be employed for practical applications on an industrial scale as an efficient and cost-effective material.

Keywords: adsorption, biochar, depollution.

Acknowledgment: The authors would like to thank the European Commission and UEFISCDI, Romania, for funding in the frame of the collaborative international consortium COFUND-WATER4ALL-DIME, financed under the 2022 Joint call of the European Partnership 101060874 — Water4All.

THE EFFECT OF DIFFERENT STRESSORS ON PLANT'S PHYSIOLOGIC PARAMETERS AND SECONDARY METABOLITES

Lucian COPOLOVICI[1,2*], Andreea LUPITU[3], Flavia BORTES[2,3], Maria COJOCARU-TOMA[4], Angelica OHINDOVSCHI[4], Mihaela NARTEA[4], Cristian MOISA[3], Dana COPOLOVICI[1]

[1]Faculty of Food Engineering, Tourism and Environmental Protection, Aurel Vlaicu University, Elena Dragoi St. 2, Arad, 310330, Romania
[2]Interdisciplinary Doctoral School of Aurel Vlaicu University, Elena Dragoi St. 2, Arad, 310330, Romania
[3]Institute for Interdisciplinary Research, Aurel Vlaicu University, Elena Dragoi St. 2, Arad, 310330, Romania
[4]State University of Medicine and Pharmacy "Nicolae Testemițanu" of the Republic of Moldova, Stefan cel Mare si Sfant Boulevard 165, MD-2004, Chișinău, Moldova
[*]Corresponding author, e-mail: lucian.copolovici@uav.ro

Introduction: Plants are subjected to various stressors, including abiotic factors such as drought, extreme temperatures, and salinity, and biotic factors such as pests, pathogens, and herbivores. Plants employ different defense strategies to cope with these stressors, categorized as direct or indirect. Direct defense strategies include the production of physical barriers like thorns and trichomes and chemical defenses such as synthesizing toxic compounds or enzymes that deter herbivores and pathogens. Indirect defense strategies involve attracting natural enemies of herbivores or pathogens, such as releasing volatile organic compounds to attract predatory insects that feed on the herbivores attacking the plant.
Aims: We studied the influence of different abiotic or biotic stressors on plants from the *Galium* and *Helichrysum* genius to determine how those plants respond to various stresses.
Materials and Methods: Plants from the *Galium* and *Helichrysum* genera have been grown from seeds in growth chambers, and different abiotic stresses (temperature, drought, flooding) and biotic stresses (such as pests, pathogens, and herbivores) have been tested. The secondary metabolites were determined using the HPLC method, and photosynthetic parameters were obtained from the gas exchange system.
Results: We found that photosynthetic parameters, volatile organic compound emissions, chlorophyll content, and total polyphenol concentrations change in plants under environmental stress conditions. Furthermore, all secondary metabolite concentrations have been modified differently for plants grown in different locations.
Conclusion: Our study demonstrated that *Galium* and *Helichrysum* plants exhibit significant changes in physiological and biochemical parameters in response to abiotic and biotic stressors. Photosynthetic parameters, volatile organic compound emissions, chlorophyll content, and total polyphenol concentrations were notably affected under stress conditions.

Keywords: photosynthesis, secondary metabolites, plant stress.

Acknowledgment: This work was supported by a grant from the Romanian National Authority for Scientific Research, CNCS – UEFISCDI, project number PN-IV-P8-8.3-ROMD-2023-0022.

DETERMINATION OF QUALITATIVE INDICATORS OF WORK IN THE APPLICATION OF SOLID CHEMICAL FERTILIZERS

Roland-Sandor DEJŐ[1], Ovidiu MARIAN[1]*, Ovidiu RANTA[1], Alexandru GHEȚE[1]

[1] *Faculty of Agriculture. , The University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania*
*Corresponding author, e-mail: ovidiu.marian@usamvcluj.ro

Introduction: It is well known that in a performant agricultural system, one of the main means of achieving a constant, realiable and high value yield is by correctly applying the fertilizers. The correct use of fertilizers imply the knowledge of the scientific basis also the knowledge of all the factors that influence the efficiency of their application (Vidican et al, 2017).
Aims: The main aim of the experiment was to study the uniformity of fertilizer application at different travel speeds.
Materials and Methods: In the present study the main used piece of machinery was a RAUCH MDS 935 spreader, working in aggregation with a Massey Ferguson 3080 tractor. The fertilizer was collected by using the izo base membrane. The measurements were done with a KERN EMB 600-2 high precision balance.
Results: The obtained results show that at the travel speed of 6 km/h the distribuited quantity of fertilizer was between 24.04 g/m^2 and 31.81 g/m^2 on the membrane verified on 3 different repetitions. Using 11 km/h travel speed the results obtained were between 24.14 g/m^2 and 26.78 g/m^2, by using this results we could determine that this speed was the most apropiate for carrying out the fertilizing process. Lastly the speed that was used was 17 km/h and the obtained quantity of fertilizer was between 16.85 g/m^2 and 31.31g/m^2.
Conclusion: In the present study, we demonstrated that the most suitable travel speed of the tractor is 11km/h while carrying out the fertilization process. From the point of distribuition uniformity we got the most apropiate values, those that were between 96.62% and 98.04% at this speed. The flow stability coefficient was also the highest at this speed with the values between 92.83% and 95.85%.

Keywords: agriculture, fertilizer, spreading

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INVASIVE SPECIES *Corythucha ciliata* SAY AND *Corythucha arcuata* SAY - REVIEW

Diana DRĂGAN[1],* Arnilva MARA[1], Horia BUNESCU[1], Ionuț- Bogdan HULUJAN[1*], Teodora FLORIAN[1]

[1] *Faculty of Agriculture, University of Agricultural Sciences and Veterinary Medicine, Cluj-Napoca, Calea Mănăștur 3-5, Cluj-Napoca 400372, Romania*

[*]Corresponding author, e-mail: diana.poputa@usamvcluj.ro, ionut-bogdan.hulujan@usamvcluj.ro

Introduction: Globalization facilitates the spread of invasive alien species as international commerce develops new trade routes, markets, and products (Meyerson and Mooney, 2007). The ability of a foreign species to overcome various barriers in the new environment is affected, positively or negatively, by the presence of other species, native or foreign, already resident in the area.
Aims: The research aimed to evaluate two species that have recently appeared in our country; these are *Corythucha ciliata* Say and *Corythucha arcuata* Say, both belonging to the Tingidae Family of the Order Hemiptera. *Corythucha ciliata* Say and *Corythucha arcuata* Say originate from North America.
Materials and Methods: A comprehensive literature search was conducted using electronic databases, including PubMed, Scopus, and Google Scholar.
Results: The optimal climatic regime for *Corythucha ciliata* in southern Romania requires temperatures between 20 and 30 °C and a relative air humidity of 40-50 %. Adults and larvae of the oak lace bug feed directly on leaves, causing a reduction in photosynthesis, premature defoliation, and consistent discoloration.
Conclusion: In conclusion, this scientific paper has comprehensively examined various aspects of the morphology, biology, ecology, and management strategies related to the two invasive species. Through extensive research and compilation of expert literature, this study contributes valuable insights and foundational knowledge essential for understanding and addressing the challenges posed by these invasive species *Corythucha ciliata* Say and *Corythucha arcuata* Say.

Keywords: lace bugs, plane tree, oak, morphology, ecology, control methods.

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TRANSFER CAPACITY OF SOME POLLUTANTS - HEAVY METALS FROM SOIL TO *PRUNUS SP.*

Claudiu-Denis FILIP[1], Mirela Ana COMAN[1,2]

[1] *University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca, 3-5 Calea Mănăștur, 400372 Cluj-Napoca, România*

[2] *Technical University of Cluj Napoca, no. 62 A, V. Babeş Str, 430083 Baia Mare, România*

[*]Corresponding author, e-mail: claudiu.filip98@gmail.com / claudiu-denis.filip@student.usamvcluj.ro

Introduction: Heavy metals present in large quantities in soil surface horizons are stable toxic compounds and are complexed with various organic or inorganic ligands, which amplifies their toxicity and, therefore, produce negative effects in the various organs of plants and animals in that area [Lăcătușu et al., 2007; Hreniuc et al., 2020; Filip and Coman, 2023].
Aims: The aim of the present paper is to know the current level of heavy metal contamination, in particular Pb and Cd, in soil and fruit (*Prunus sp.*) in the area of the glacis and contact piedmont of the Baia Mare Depression. The final aim is to determine the most effective measures to rebalance the affected croplands.
Materials and Methods: The area of interest is an area of approx. 588.8 km^2 of the area presented above and, for comparison, a "clean area" in the Maramureș Depression, i.e., the Sighetu-Marmației area. From these perimeters both soil samples from different depths and *Prunus* fruit samples (ripe, healthy plums from different farms) were taken. Laboratory analyses focused on the heavy metal content, i.e., Pb and Cd, in the soil and fruit of the related plants.
Results: The results show contents far exceeding the normal and normalized soil heavy metal limits. For example, in Ferneziu *soil samples* were determined contents of 1.247 mg/kg (5cm), 600 mg/kg (30 cm) for Pb, and values of 11.60 mg/kg (5 cm) 6.73 mg/kg (30 cm) for Cd [Hreniuc and Coman, 2021].
In the *fruit samples* from the studied area, the Pb and Cd concentrations determined were, in all cases, below the maximum permissible limits [Filip and Coman, 2023].
Conclusions: Based on the obtained results we are entitled to state that an integrated soil-crop-plant analysis is required. With this paper we emphasize the importance of compliance with food safety standards at international and national level through Codex Alimentarium and Order 975/1998.

Keywords: Environmental impact, Food safety, Heavy metals

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LIVING LAB APPROACH FOR BETTER UNDERSTANDING AGROFORESTRY SYSTEMS

Adrian GLIGA[1*] Dumitrița DASCĂLU[1] Mignon ȘANDOR[1]

[1] *Department of Engineering and Environmental Protection, Faculty of Agriculture, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania*
[*]Corresponding author, e-mail: adrian.gliga@usamvcluj.ro

Introduction: Agriculture in rural areas emerges as a crucial point of intervention. Several challenges must be addressed when considering agriculture in rural areas (Sánchez-Zamora et al., 2014). Recent research suggests that a continuous exchange between farmers and researchers, results in knowledge creation (Toffolini et al., 2023). In the field of agriculture, Living Labs (LLs) can be used to address various sustainability challenges and climate change adaptation (Cascone et al., 2024).
Aims: The paper aims to present the LLs concept and reflects on its use in Pathways research project. The idea of LLs is presented as a framework for studying and acting in living settings and the wider environment.
Materials and Methods: We propose the analysis of two agroforestry farms located at different altitude where extensive grazing is being carried out during the summer period. For comparative analyses we will use a farm where cows are keep indoors most of the time and fed silage, hay and concentrate. Milk samples will be collected monthly and analyzed in a specialized laboratory. In total, 15 milk sample will be analyzed. Grassland specialist will analyse pasture plant diversity during 2024. Species of ecological and economic importance will be identified, recorded and analyzed.
Results: The cooperation between all involved actors in the management of agroforestry systems will ensure a good understanding of the problems. We expect that our results will determine other small producers to join association, to sell their products better and to understand the natural and social importance of the agroforestry systems.
Conclusion: Romanian farmers can use such results to optimize the economic and environment performance of their farms.

Keywords: Living Lab, agroforestry, quality analyses.

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COMPARISON OF DENSITIES AND FEATURES OF LEAF PELTATE GLANDULAR TRICHOMES IN FOUR *SALVIA* SPECIES

Robert Adrian HAAS[1], Ioana CRIŞAN[1*], Dan VÂRBAN[1], Rodica VÂRBAN[1]

[1]*Faculty of Agriculture, University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca, Calea Mănăștur Street No. 3-5, 400372 Cluj-Napoca*
[*] Corresponding author: ioana.crisan@usamvcluj.ro

Introduction: Glandular trichomes are secretory structures on the surface of many economically important species from the *Lamiaceae* family. Among these structures, peltate trichomes are most relevant for specialized metabolites produced by the genus *Salvia*, yet there is a lack of comparative studies between species in this regard.
Aims: The aim of the research was to explore the relationship between leaf area and presence of peltate trichomes in four important medicinal *Salvia* species. To reach this aim were defined two objectives: 1) determining the leaf area, 2) determining density of peltate trichomes on the leaf.
Materials and Methods: The biologic material of study was represented by four species of *Salvia*, cultivated in 2024 in the experimental field from Agro-Botanical Garden USAMV Cluj-Napoca. Leaf area and number of glandular trichomes were determined on the leaves of species: *Salvia officinalis* L., *Salvia sclarea* L., *Salvia verticillata* L. *Salvia nemorosa* L. Based on determinations were calculated the densities of glandular trichomes on the leaves from the base of the plants, from the middle and from the top. For *Salvia sclarea* L. the determinations were conducted only for leaves from basal rosette.
Results: Among the four studied species, *S. officinalis* showed the highest leaf trichomes density with an average of 433,32 trichomes/cm^2 on abaxial surface. For the specie *S. nemorosa* has been recorded 148,28 trichomes/cm^2 on the abaxial leaf surface and for *S.verticillata* and *S. sclarea* 78,10 trichomes/cm^2 and respectively 54,90 trichomes/cm^2 were found. There was observed a variability in the peltate trichomes density according to leaf position on the plant, with highest densities for leaves from the top of the plant.
Conclusion: The peltate trichomes density varies with species and leaf position on the plant (base, middle or top of the plant) having potentially practical implications in optimizing cultivation technology, harvesting of plant material or essential oil extraction in *Salvia* species.

Keywords: *Salvia* sp., *Lamiaceae*, leaf, glandular trichome, essential oil.

RESEARCHERS ON THE PRODUCTIVE PERFORMANCE OF SOME ROMANIAN PEA VARIETIES IN ECOLOGICAL AND CONVENTIONAL SYSTEMS

Cristina MOLDOVAN[1], Loredana SUCIU[1], Anca PLEȘA[1*], Anamaria MĂLINAȘ[1], Roxana VIDICAN[1]

[1] *Faculty of Agriculture, University of Agricultural Sciences and Veterinary Medicine, Cluj-Napoca, Romania*
[*]Corresponding author, e-mail: anca.plesa@usamvcluj.ro

Introduction: Pea is one of the most important crop plants (second after soybean) in the Fabaceae family (Shanthakumar *et al*., 2022) being considered a safe and cheap source of protein, starch, fiber, vitamins and minerals, low-fat, gluten-free, and low-allergenic (Munialo *et al*. 2014). Leaving the field early and leaving the soil enriched in nitrogen thanks to the symbiosis between the pea roots and *Rhizobium spp.* bacteria creates ideal conditions for the plants that follow in the rotation.
Aims: In the present work, we aimed to test the influence of the biological cultivation method on the productivity elements of native yellow pea varieties in the eco-pedological conditions of Transylvania, elaboration of recommendations regarding the applied technology on some morphological and productivity elements in autumn peas.
Materials and Methods: Pea crops were placed in two different locations (SDE Cojocna and private farm), under the same pedoclimatic conditions. The soil and plant analyzes were carried out according to the methods approved in the specialized laboratories. During the vegetation period, measurements and observations were made regarding the productivity elements at the variations taken in the study. Three autumn pea varieties were studied: Olguța, Ghittia and Olguța created at INCDA Fundulea.
Results: In the organic farming system, the Olguța variety showed a reduced number of pods/plant, number of grains in the pod and the highest value of the MMB. In the organic farming system, the most productive pea variety was Ghittia with a production of over 2300 kg/ha and in the conventional farming system Olguța with a production of over 5000 kg/ha.
Conclusion: Based on the valuable productivity elements that are of interest to agricultural producers, farmers, but also on some quality characteristics such as the protein percentage, a selection of pea varieties to be cultivated in the Transylvanian Plain can be made.

Keywords: peas, production, protein, farming system

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STUDY REGARDING METHODS AND TECHNIQUES USED FOR ANALISYS OF SPRAY DRIFT AND DROPLET SIZE DISTRIBUTION BY AGRICULTURAL SPRAYING MACHINES

Adrian MOLNAR-IRIMIE[1], Ovidiu RANTA[1], SORIN STĂNILĂ[1] and Ovidiu MARIAN[1]

[1] *Faculty of Agriculture, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania*
[*]Corresponding author, e-mail: adrian.molnar@usamvcluj.ro

Introduction: Spray drift is the effect of droplet transport to non-targeted surfaces by air circulation near sprayer nozzles used for pesticides application in field crops, orchards and vineyards. This can result in a reduction of treatment efficiency, economic impact, increase of air and water pollution, negative effects on animal and plant health.
Aims: This paper analyses state-of-the art methods and techniques for spray drift studies in field and laboratory conditions, in order to quantify the parameters related with droplet deposition on target surfaces. Also, researches methods and techniques for precise measurement of droplet size distribution of agricultural nozzles used for pesticide application.
Materials and Methods: Review of the standards, requirements or rules related with proper sprayer testing in problems related with drift and nozzles. Review of the scientific literature focused on spray drift studies or for droplet size measurements, depending on various parameters that reliably quantify nozzle spray working conditions.
Results: This review shows the most important parameters that have influence on spray drift and droplet size distribution, so the spraying machine is properly set up, used and adjusted in order that pesticide is applied as efficient as possible, to reduce losses and environment pollution.
Conclusion: In this research work there were showed the latest and reliable methods and techniques to be used to characterize quality working parameters of spraying machines with a view on spray drift and droplet size, with emphasize on the one that are user friendly so that can be used in field conditions by farmers, but also on the one latest one that are used for research purposes.

Keywords: agricultural sprayer nozzles, droplet size, pesticides, spray drift, spraying equipment

EXPLORING THE NUTRITIONAL SIGNIFICANCE OF WILD MUSHROOMS: A CASE STUDY OF *Boletus edulis* AND *Cantharellus cibarius*

Alexandra-Cristina MUREȘAN[1], Antonia ODAGIU*[1], Claudia BALINT[1]

[1] *Faculty of Agriculture, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca*
*Corresponding author, e-mail: antonia.odagiu@usamvcluj.ro

Introduction: Wild mushrooms are valuable sources of nutrients and bioactive compounds, playing a significant role in human nutrition and offering therapeutic potential. *Boletus edulis* and *Cantharellus cibarius* are among the most highly regarded edible mushroom species due to their nutritional value and properties.
Aims: This study aims to investigate the nutritional composition of these species, with a focus on their high levels of proteins, fibers, and essential minerals such as potassium, phosphorus, and iron.
Materials and Methods: Boletus (*Boletus edulis)* and Chanterelle (*Cantharellus cibarius)* mushrooms were collected during their peak growing season, ensuring correct identification and recording of collection locations. After collection, the mushrooms were cleaned of impurities and dried to prevent degradation of bioactive compounds. The analysis of the nutritional composition is realized by determining the protein content using the Kjeldahl method, which measures the nitrogen content, which is then converted into protein equivalent. Lipid content is determined by Soxhlet extraction using the organic solvent petroleum ether. Additionally, the carbohydrate and mineral content will be measured to provide a comprehensive nutritional profile.
Results: The data obtained were statistically analysed using specialized software to determine the significance of differences between samples. Correlation analyses will be conducted to investigate the relationships between the chemical composition and the nutritional properties of the species studied.
Conclusion: The study demonstrates that *Boletus edulis* and *Cantharellus cibarius* provide significant nutritional benefits due to chemical composition. Thus, including these mushrooms in the diet may contribute to the prevention of diseases and promote overall health. These findings suggest the need for continued research to fully explore the potential of these wild mushrooms in nutritional contexts.

Keywords: *Boletus edulis, Cantharellus cibarius*, proteins, minerals, nutritional benefits.

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COMPREHENSIVE NOISE RISK ASSESSMENT IN HIGH-DENSITY URBAN AREAS: IMPLICATIONS FOR PUBLIC HEALTH AND ENVIRONMENTAL MANAGEMENT

Antonia ODAGIU[1], Claudia BALINT*[1], Bianca MOLDOVAN[1], Cristian IEDERAN[1], Dragoș OROIAN[1]

[1] *Faculty of Agriculture, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca*
*Corresponding author, e-mail: claudia.balint@usamvcluj.ro

Introduction: Urbanization has led to increased noise pollution, which negatively affects human health and environmental quality. Research has consistently shown that prolonged exposure to high decibel environments can lead to a variety of health problems, including hearing impairment, sleep disturbances, cardiovascular diseases, and heightened stress levels (Smith at al., 2021). Additionally, the World Health Organization (WHO) has highlighted noise as a significant environmental stressor that undermines the quality of life in urban settings (WHO, 2020).
Aims: This study aims to quantify and analyze the risk associated with noise pollution in congested urban areas, contributing to the growing body of literature on urban environmental hazards.
Materials and Methods: Using a mixed-methods approach, sound levels were monitored across various congested urban sites. A combination of quantitative measurements and qualitative surveys was employed to assess noise exposure and its perceived impact on the local population. The tools used for risk assessment are risk assessment matrices by combining probability and severity to rank risks and simulating the spread of noise in congested areas.
Results: The results indicated that noise levels in congested urban areas consistently exceeded WHO recommended limits, particularly during peak traffic hours. Following the results obtained from the risk matrices for recording noise levels, contingency plans shall be drawn up with clear procedures for the management of noise pollution incidents.
Conclusion: The study confirms that congested urban areas are at a high risk of noise pollution, which poses significant health risks to residents. These findings suggest the need for stricter noise regulation and the implementation of effective noise mitigation strategies in urban planning.

Keywords: noise, pollution, risk matrices, environmental hazards

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MICA BASED METAL-OXIDE ADSORBENTS FOR WATER PURIFICATION

Stelian PINTEA[1], Adina STEGARESCU[1]*, Ildiko LUNG[1], Ocsana OPRIȘ[1], Maria MIHEȚ[1], Alexandru TURZA[1], Septimiu TRIPON[1], Maria-Loredana SORAN[1], Maria PRUNEAN[2] and Delia GLIGOR[2]

[1] *National Institute for R&D of Isotopic and Molecular Technologies Cluj-Napoca, Romania*
[2] *Faculty of Environmental Science and Egineering, Babes-Bolyai University,Cluj-Napoca, Romania*
*Corresponding author, e-mail: adina.stegarescu@itim-cj.ro

Introduction: Micas are a group of silicate minerals possessing an almost perfect cleavage plane that give rise to elastic plates with overall negative surface charge. Its specific surface area can be strongly increased by surface modification/decoration. Among the options for materials to be used in the process of surface modification we have the nanoparticles of different metal oxides as previously applied for modifying the surfaces of other class of materials.
Aims: Based on our previous experience, adsorbent materials for pollutant removal from aqueous solutions were synthesized and characterized. The correlations between the increase in specific surface area and the adsorption efficiency for different classes of pollutants were investigated in our study. One of the key points of the study was to prove the possibility to reuse muscovite mica waste materials from different sources (microwave mica plates, electric insulators, and glass for high temperature furnace windows) in a completely different manner than its primary use. Reusing mica from waste material makes it very cost-effective and prevents/diminishes its further mining that comes with high environmental costs.
Materials and Methods: Mica recovered from different sources was grinded, sieved and functionalized with nanoparticles of manganese and iron oxide. The samples were characterized by X-ray diffraction, BET, SEM, TEM and adsorption measurements.
Results: Preliminary test measurements showed that muscovite mica based adsorbents decorated with manganese and iron oxide nanoparticles could be used as adsorbent materials for ciprofloxacin removal from aqueous solutions. Although it comes with smaller removal efficiency from aqueous solutions, its low cost could play an important role for further developments and applications.
Conclusion: The present investigation proves the possibility to develop cost-effective, easily available and environmentally friendly adsorbent materials based on mica waste materials from several industrial products.

Keywords: Cost-effective adsorbent material, metal oxide nanoparticles, muscovite mica, pollutant removal, waste recovery

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EVALUATION OF THE MAIN PRODUCTION ELEMENTS OF THE VARIETY OF INDUSTRIAL HEMP (*CANNABIS SATIVA* L. VAR. *SATIVA*) *MARA 21*, UNDER THE CONDITIONS OF THE SUCEVAVA PLATEAU

Laurențiu PINTRIJEL[1], Costel SAMUIL[2], Constantin LUNGOCI[2], Iuliana MOTRESCU[3,*], Ioan PUIU[2] Carmen Simona GHIȚĂU[2], Constantin Lucian HARAGA[2] and Teodor ROBU[2]

[1]Brado Agri S.R.L., Vascauti, 727394, Suceava, Romania
[2] Faculty of Agriculture, Iasi University of Life Sciences "Ion Ionescu de la Brad" (IULS), M. Sadoveanu Alley 3, Iasi, 700490, Romania
[3]Department of Exact Sciences, Faculty of Horticulture, "Ion Ionescu de la Brad" University of Life Sciences, 3 Mihail Sadoveanu Alley, 700489 Iasi, Romania
[*]Corresponding author, e-mail: iuliana.motrescu@iuls.ro

Introduction: One of the strategies for carbon sequestration aims, in various forms, to encourage agricultural practices that help to sequester carbon from the atmosphere and fix it in the soil or biomass in a sustainable way. Among the alternatives, industrial hemp (*Cannabis sativa* L. var. *sativa*) emerges as a key crop in supporting humanity's journey towards sustainability. A highly versatile plant, industrial hemp has numerous uses in the textile, food, pharmaceutical and energy industries, soil decontamination or erosion control, etc.
Aims: This paper analyses the main biometric and yield parameters of the *Con H* line, from which the industrial hemp variety *Mara 21* (*Official Catalogue of Varieties and Hybrids, 2021*) was developed.
Materials and Methods: The research involved three factors (row spacing, intervention method and foliar fertilization). The experiment was laid out according to the current rules of experimental technique, in the form of randomized blocks. Data were processed by the method of limiting differences (LD). Among the parameters analysed were plant height, number of branches, seed weight per plant, TGM, vegetable oil content and yield, and finally an economic efficiency of the applied methods was performed.
Results: During the two years of the observations, the largest height was found to be 197.35±0.0 cm, with a maximum number of branches of 56.5±2.12 and a maximum amount of 133.05±4.17 g seeds per plant. The maximum TGM was 23.4** g, the vegetable oil content was 294.0*** mL/kg, and the seed yield was 1636*** kg/ha in 2018. The highest gross profit was obtained in 2019 and was 3906.8 lei.
Conclusion: The *Con H* line responded satisfactorily in all TICSPM test points. It was therefore certified as a variety under the name *Mara 21*.

Keywords: *Cannabis sativa* L. *var. sativa,* foliar fertilization, TGM, vegetable oil

THE VARIABILITY OF YIELD AND QUALITY PERFORMANCE OF SOME WHEAT GENOTYPES IN DIFFERENT ECOLOGICAL CONDITIONS

Ionut RACZ[1,2], Rozalia KADAR[1] Diana HIRISCAU[1] Adina VARADI[1] Darius MORAR[1] Simona Florina ISTICIOAIA[3], Beniamin ANDRAS[4], Indira GALIT[5], Gabriela GORINOIU[6]

[1] *Agricultural Research and Development Station Turda*
[2] *Faculty of Agriculture, University of Agricultural Science and Veterinary Medicine Cluj Napoca*
[3] *Agricultural Research and Development Station Secuieni*
[4] *Agricultural Research and Development Station Livada*
[5] *National Agricultural Research and Development Institute Fundulea*
[6] *Agricultural Research and Development Station Lovrin*
[*]Corresponding author, e-mail: ionut.racz@scdaturda.ro

Introduction: wheat is one of the main crops worldwide and the creation of new wheat variety imply testing of its performances in a wide range of conditions.
Aims: the main purpose of this paper is to identify the best performing wheat genotypes both in terms of grain production and their quality in different ecological conditions.
Materials and Methods: 25 wheat genotypes (four control genotypes and 22 perspective lines) were tested in a field condition in five different ecological condition (ARDS Turda, ARDS Secuieni, ARDS Livada, NARDI Fundulea respectively ARDS Lovrin) for their grain yield potential and grain quality.
Results: the obtained experimental results highlighted different genotypes for each of the five locations, but the centralization of the data allowed the identification of four genotypes for yield performance respectively six genotypes for grain quality.
Conclusion: the testing of wheat genotypes in different ecological conditions allowed the identification of the perspective line T. 61-19 and t. 95-16 as having a high productivity and a superior grain quality, combining the two agronomic characters in a favourable way.

Keywords: adaptability, grain quality, grain yield, wheat

ASSESSMENT OF THE EFFECTS OF SLOW-RELEASE FERTILIZERS APPLICATION OVER THE DEVELOPMENT OF WINTER WHEAT UNDER CONTROLLED CLIMATE CONDITIONS

Lucian RĂUS[1], Diana BOLOHAN[1]

[1] *Faculty of Agriculture, Iasi University of Life Sciences (IULS), Romania*
[*]Corresponding author, e-mail: diana.bolohan@iuls.ro

Introduction: Nitrogen fertilizers—used to grow crops around the globe—have a problem. After they're applied to soil, more than three-quarters of their nutrients get washed away before plants can absorb them. Urea an Amoniun Nitrate are a common nitrogen source in fertilizer, but it quickly breaks down into ammonia and nitrate, which evaporate or rainfalls and it quickly flushes away. To account for that loss, farmers need to apply extra fertilizer to crops, which is expensive.
Aims: Slow-release fertilizers provide a steady supply of plant nutrients over an extended period of time. They contain plant nutrient(s) (mostly nitrogen) in a form that delays their initial availability. Due to that fact real slow-release fertilizers are providing a sustainable and continuous N supply for up to 4 months even in uncertain weather conditions. The objective of these investigations was to study what was the amount of nitrogen leached after the administration of nitrogen fertilizers and how it influenced the development of plants during the vegetation period.
Materials and Methods: The experiment was carried out in pots of vegetation with winter wheat. The experiment was conducted in the Green house with controlled climate conditions within ICAM Iasi - USV Iasi. We have used pots with constant volume, filled with 2 types of soil with different reaction. Methods used for analytical characterization and research of soils – according to ICPA instructions of pedologic mapping.
Results: This paper presents the results obtained regarding the influence of 5 nitrogen fertilizers, 2 classic fertilizers and 3 slow-release nitrogen fertilizers. The experiment was carried out in pots of vegetation with winter wheat. In these investigations we have study what was the amount of nitrogen leached after the administration of nitrogen fertilizers and how it influenced the development of plants during the vegetation period.
Conclusion: The amount of nitrogen leached after the administration of nitrogen fertilizers is influenced by the chemical forms of nitrogen included in the chemical composition of the fertilizers, but also by the structure, texture, chemistry of the soil and its fertility status. The amount of nitrogen leached is significantly lower for Sulfamo 25 and 30 variants compared to N2017TAR, Ammonium Nitrate, Ureea and the control, for both experiments.

Keywords: slow-release fertilizers, nitrogen leached, soil chemistry

COMPARATIVE ANALYSIS OF PLASMA TREATMENT TECHNOLOGIES ON SEED GERMINATION AND EARLY GROWTH OF *TRITICUM AESTIVUM* L. CV. GLOSA

Ioana Cătălina NICOLAE[1], Oana VENAT[1], Roxana CICEOI[1*], Bogdana MITU[2], Monica MAGUREANU[2]

[1]*Research Center for Studies of Food Quality and Agricultural Products, University of Agronomic Sciences and Veterinary Medicine of Bucharest (USAMVB), Romania*
[2]*National Institute for Laser, Plasma & Radiation Physics (INFLPR), Magurele, Romania*
[*]Corresponding author, e-mail: roxana.ciceoi@qlab.usambv.ro

Introduction: Plasma treatment is an emerging technique for enhancing seed sprouting and plant growth. It shows potential for increasing seed viability and lowering pathogen presence, making it a compelling alternative to traditional pre-sowing seed treatments in agriculture.
Aims: Assessing the impact of two plasma methods on the germination and early development of *Triticum aestivum* L. cv. Glosa seeds.
Materials and Methods: The seeds underwent treatment at INFLPR using either a pulsed voltage DBD (Dielectric Barrier Discharge) reactor (PV-DBDR) or an RF plasma fluidized bed reactor (RF-PFBR). They were then evaluated for growth parameters at USAMVB. The Petri dishes were maintained at 22°C with a half-day light cycle in a growth chamber.
Results: The biometric indices measured included the number of germinated seeds, number of roots, root length, and sprout length. In terms of germination, the control group had the lowest rate at 92.5%, similar to RF-PFBR (7 minutes), followed by RF-PFBR (10 minutes) at 95%, and PV-DBDR at 100%. The average number of roots was lowest in the control group at 4.13 and highest in the PV-DBDR group at 4.49. The control also had the shortest average root length at 136.95 mm, whereas RF-PFBR (7 minutes) had the longest at 167.63 mm. For sprout length, the control exhibited the least growth at 28.72 mm, while RF-PFBR (7 minutes) showed the most significant growth at 36.56 mm.
Conclusion: These initial findings indicate that both plasma technologies positively influence seed germination and growth compared to untreated seeds. PV-DBDR demonstrated the greatest impact on seed germination and root number, while RF-PFBR (7 minutes) showed the most substantial effect on early plant growth, average root length, and average sprout length. To achieve optimal results, it is essential that seeds are uniformly treated by the plasma flux. Further studies will explore various energy and power levels.

Keywords: wheat plant, plasma technology, seed germination, DBD reactor, RF-generated plasma

Acknowledgement. This work is part of program Ader 2.1.7. - Research on the use of plasma technologies in pests and diseases of stored agricultural products and evaluation of its effects on seeds and plants, for sustainable and quality productions.

SESSION 3: FOOD SCIENCE AND TECHNOLOGY

FROM WASTE TO WEALTH : BIOCONVERSION OF XYLAN FROM SUGAR CANE BAGASSE INTO FUNCTIONAL XYLO-OLIGOSACCHARIDES (XOS)

Montarop YAMABHAI[1*]

[1]*School of Biotechnology, Suranaree University of Technology, Nakhon Ratchasima, 30000, Thailand*
[*]Corresponding author, e-mail: montarop@g.sut.ac.th

Introduction: Agro-based industries generate significant amounts of waste biomass, which holds immense potential for profitable valorization. Utilizing agricultural waste not only adheres to the "reduce, reuse, recycle, and recovery" principles of the zero-waste policy but also increases the bioavailability of these wastes in the form of biofuels, value-added products, and biorefinery job opportunities.
Aims: This study explores the potential of valorizing sugarcane bagasse, a major agricultural waste in Thailand, by converting it into functional xylo-oligosaccharides (XOS) with prebiotic and anti-inflammatory properties.
Materials and Methods: Sugarcane bagasse, rich in xylan, is used as the primary biomass for this research. Enzymes, acting as biocatalysts within green and clean technologies, are employed to break down the bagasse into functional XOS. The process involves enzyme-based hydrolysis to extract XOS and evaluate its prebiotic and anti-inflammatory activities.
Results: The valorization process successfully converted sugarcane bagasse into XOS. The XOS demonstrated significant prebiotic activity by promoting the growth of beneficial gut bacteria. Additionally, anti-inflammatory effects were observed in preliminary biological assays, indicating potential applications in functional foods and pharmaceuticals.
Conclusion: The valorization of sugarcane bagasse into XOS presents a promising pathway for the sustainable use of agricultural waste. This approach contributes to waste reduction and creates new value streams for industries such as functional foods and pharmaceuticals, aligning with principles of the bio, circular, and green economy.

Keywords: agricultural waste, biocatalysts, prebiotic, sugarcane bagasse, xylo-oligosaccharides (XOS)

FOODOMICS: EMERGING TECHNOLOGY TO INTEGRATE FOOD CHEMISTRY IN THE SYSTEMS' BIOLOGY CONCEPT

Carmen SOCACIU

[1] *Faculty of Food Science and Technology, University of Agricultural Sciences and Veterinary Medicine, Cluj-Napoca,Romania*
[2] *Dept.Biotechnology, RTD Centre Biodiatech-Proplanta Ltd, Cluj-Napoca, Romania*
[*]Corresponding author, e-mail: carmen.socaciu@usamvcluj.ro

Introduction: The development of the systems biology, especially by various omics tools, is beneficial to the study and impact of food composition on human health. The traditional food research and analysis emerged the last decades towards Foodomics technology, studying the relationship between food composition, quality/safety and its impact on nutrition, using omics tools (genomics, transcriptomics, proteomics, and metabolomics).
Aims: This review provides updated information reflecting the added value of foodomics, which combine the advanced analytical techniques with bioinformatics. It will focus especially on food metabolomics and its impact on personalized nutrition, discovery of new dietary biomarkers, current opportunities and challenges.
Materials and Methods: Literature data combined with experimental results are presented, including a summary of achievements in the Department of Food Chemistry at USAMV Cluj-Napoca, as well at Biodiatech Centre where UHPLC-QTOF-ESI$^+$-MS, coupled with bioinformatics are applied in different food matrices.
Results: Different case studies are presented, showing the performance of metabolomics to characterise and authenticate foods (based on bioactive ingredients), or food supplements.
Conclusion: Food metabolomics represents an important part of foodomics and offers a high-throughput analytical platform to identify, by untargeted or targeted techniques, the fingerprint or key metabolites profiles and quantitation, as important tool in food science and technology.

Keywords: food analysis, foodomics, food metabolomics, systems biology

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OXIDOREDUCTASE-BASED BIOSENSORS FOR FOOD APPLICATIONS

Dietmar Haltrich

Department of Food Science and Technology, BOKU University Vienna, Muthgasse 118, 1190 Wien, Austria
*Corresponding author, e-mail: dietmar.haltrich@boku.ac.at

Introduction: Food analysis and control are critical in food research and production to ensure the quality and safety of food products. Electrochemical biosensors using enzymes as bioreceptors are emerging as promising tools due to their high selectivity, sensitivity, fast analysis time, and cost-effectiveness compared to conventional methods (Wijayanti *et al.*, 2023a).
Aims: This study aims to present two examples of oxidoreductase-based electrochemical biosensors for measuring carbohydrate analytes in food, focusing on lactose and maltose detection.
Materials and Methods: A biosensor using cellobiose dehydrogenase (CDH) was developed for lactose detection. CDH oxidizes lactose with minimal interference from glucose, enabling accurate measurement of lactose concentrations in lactose-free products. A third-generation biosensor was constructed based on CDH's ability to transfer electrons directly to an electrode (Scheiblbrandner *et al.*, 2020). A FAD-dependent glucose dehydrogenase from Trichoderma virens (TvGDH) was investigated for maltose detection. TvGDH was immobilized on a graphite electrode method (Wijayanti *et al.*, 2023b), and its electrochemical properties were studied, focusing on its substrate preference for maltose over glucose.
Results: The third-generation lactose biosensor, Lactosens, developed by DirectSens, accurately measures low lactose concentrations in food matrices, meeting EU standards for lactose-free labeling (<0.1 g/L). For maltose, the TvGDH-based biosensor demonstrated a linear detection range of 0.5–15 mM with a detection limit of 0.45 mM. However, it also showed activity with glucose and maltotriose, indicating the need for further optimization to improve specificity.
Conclusion: The lactose biosensor based on CDH offers a reliable solution for measuring residual lactose in food products, while the maltose biosensor based on TvGDH shows promise but requires further refinement to enhance selectivity. These biosensors represent significant advancements in food analysis technology, contributing to more efficient and accurate carbohydrate measurement.

Keywords: biosensor, electrochemical, lactose, maltose, oxidoreductase

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METABOLIC PROFILING OF PLANTS AS A TOOL FOR NEW BIOACTIVES DISCOVERY AND QUALITY CONTROL

Ludger A. WESSJOHANN[1*]

[1*]*Leibniz Institute of Plant Biochemistry (IPB), 06120 Halle (Saale), Germany*
[*]Corresponding author, e-mail: wessjohann@ipb-halle.de

Introduction: Modern analytical and computational methods allow the fast generation and analysis of large data sets of small molecules in plants. However, important for high value generation with plant ingredients are commonly defined (single) components. Profiling the metabolome of plants and plant based preparations in combination with computational tools and bioactivity assays can pinpoint the most relevant constituents even in complex metabolomes and processes.
Aims: To elucidate the relevant metabolites even from complex extracts and to identify adulterations through metabolic profiling.
Materials and Methods: Hops (*Humulus*), St. John's wort (*Hypericum*), oleander (*Nerium*) and other medicinal plants were collected and processed using solvent extraction (methanol etc.). Metabolomic profiling was performed via UPLC-MS and NMR, and bioactivity was assessed using different cell based assays. Biotransformation methods were applied to convert plant waste into valuable compounds using microbial or enzymatic systems.
Results: The concept of combining differential metabolic profiling with bioassays and/or phylogenetic or genetic data allows to pinpoint defined relevant compounds in plants even in complicated cases. It also allows to determine the most suitable clones, harvesting time or adulterations/impurities. Examples for selected species will be presented and a short glimpse will be given, how biotransformation can help to produce larger amounts of commercial plant constituents from plant waste.
Conclusions: Metabolic profiling effectively identifies key bioactives and ensures quality control, while biotransformation boosts valuable compound yields from plant waste.

Keywords: biocatalysis, food plants, medicinal plants, metabolomics, phytochemistry

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USING EXTERNAL FIELDS TO RECOVER MICROALGAL FUNCTIONAL INGREDIENTS

Ruoxi ZHANG[1], Jacques KIEFFER[1], Michel EPPINK[1], Rene WIJFFELS[1,2], Vittorio SAGGIOMO[3] and Iulian Z. BOBOESCU[1]*

[1] Bioprocess Engineering Chair, Wageningen University, Wageningen, the Netherlands
[2] Faculty of Biosciences and Aquaculture, Nord University, Bodø, Norway
[3] BioNano Technology Group, Wageningen University, Wageningen, the Netherlands
*Corresponding author, e-mail: Iulian.boboescu@wur.nl

Introduction: Microalgae are single cell plants which convert carbon dioxide into functional ingredients such as proteins, carbohydrates, lipids, pigments and secondary metabolites. Their conversion efficiency is higher than higher plants, while the use of fertilizers, fresh water and pesticides is significantly lower. However, due to high cultivation and processing costs, wide-scale adoption of these novel ingredient sources is still not viable.
Aims: One strategy to tackling this issue is to both simplify the processing of this biomass as well as look towards multiproduct biorefineries. Using mild treatment strategies such as external fields could enable this. For instance, when combining microfluidic channels with laser, electric, inertia and acoustic fields, precise manipulation, extraction and even separation of microalgal cells and their structures can occur.
Materials and Methods: The present research employs high frequency (≈2MHz) acoustic standing waves to harvest microalgal cells in a targeted fashion based on their biomass composition. Subsequently, lower frequency (≈0.5MHz) acoustic pulsing waves are used to gently disrupt the microalgal cells, providing access to their inner components. The separation potential of the released cell structures based on their acoustic properties was investigated both *in silico* as well as *in vitro*.
Results: Acoustic fields were used to manipulate and mildly open *Tisochrysis lutea* microalgal cells in order to further fractionate their main cell components. Precisely designed microfluidic chips were manufactured and tested to assess and maximize the separation efficiency of these approaches.
Conclusion: Learning how to harness these phenomena could enable various bioprocess applications, from novel functional food ingredients to the development of bioactive compounds.

Keywords: acoustophoresis; algal multiproduct biorefinery; external fields; microfluidics

PRELIMINARY STUDY ON THE DEVELOPMENT OF WAFFLE CONES FORMULATED WITH POWDER FROM ROSEHIP WASTE

Alexandra Raluca BORŞA (BOGDAN)[1], Raluca Alexandra MATEI[1], Adriana PĂUCEAN[1], Melinda FOGARASI[1], Andrei BORȘA[1], Maria Simona CHIŞ[1] and Cristina Anamaria SEMENIUC[1]*

[1] *Faculty of Food Science and Technology , University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca, 3-5 Calea Mănăştur, 400372 Cluj-Napoca, Romania*
*Corresponding author, e-mail: cristina.semeniuc@usamvcluj.ro

Introduction: The waste that remains after processing the rosehips to obtain rosehip purée (raw material for rosehip jam) can be a valuable source of fibres, carotenoid pigments, phenolic compounds, and micro- and macro-elements (Borşa (Bogdan) *et al*., 2023; Borsa (Bogdan) *et al*., 2024). Therefore, it could be recovered as a powder (Rp) for later use as an ingredient in the food industry.
Aims: The aim of this study was to use such a powder in the formulation of ice cream waffle cones by partially replacing (10, 15, and 20%, respectively) the wheat flour in a consecrated manufacturing recipe that uses a minimum amount of sugar necessary to obtain this type of product.
Materials and Methods: Four waffle cone formulations were prepared: control (WCc), with 3.7 (WC3.7%rp), 5.6 (WC5.6%rp), and 7.5% rosehip powder (WC7.5%rp) to fulfil the purpose. They were analysed for proximate composition, pH, colour, and sensory to identify the formula preferred by consumers.
Results: The use of Rp in the proportion of 7.5% caused a significant increase in the moisture content of waffle cones, the ash and fibre content, and a decrease in the fat and protein content, as well as the pH; instead, it did not significantly influence the carbohydrate content because wheat flour and Rp had close levels. The total colour difference (ΔE^*) of WC7.5%rp was obvious from that of WCc; however, consumers rated them to the same extent, with the difference between overall scores not being significant (8.1-8.4).
Conclusion: Rp is suitable for preparing ice cream waffle cones by replacing wheat flour in a proportion of up to 20%. Our further studies will evaluate these formulations' textural attributes, hydration properties, as well as polyphenol and carotenoid content.

Keywords: colour, proximate composition, rosehip powder, sensory analysis, waffle cones

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EXPLORING THE PHYTOCHEMICAL AND PHYSICAL STABILITY OF ANTHOCYANINS, PHYCOCYANIN, AND BETACYANIN IN A CHEESECAKE PRODUCT

Călina CIONT (NAGY) [1,2], Cristina SELIN[1], Anda TANISLAV[1,3], Bernadette-Emőke TELEKY[1], Florica RANGA[1], Vlad MUREŞAN[3], Andruţa MUREŞAN[3], Dan Cristian VODNAR[1] and Oana Lelia POP[1,2*]

[1] Department of Food Science, University of Agricultural Sciences and Veterinary Medicine, 400372, Cluj-Napoca, Romania;
[2] Molecular Nutrition and Proteomics Laboratory, Institute of Life Sciences, University of Agricultural Sciences and Veterinary Medicine, 400372, Cluj-Napoca, Romania;
[3] Department Food Technology, University of Agricultural Sciences and Veterinary Medicine, 400372, Cluj-Napoca, Romania;
[*]Corresponding author, e-mail: oana.pop@usamvcluj.ro

Introduction: In the context of continuous evolution, more and more people focus on food that goes beyond the sensory demands of taste and aroma, favoring products that contribute to improved nutrient intake and health benefits (Ertan *et al.*, 2018). The incorporation of functional ingredients into food products presents challenges related to ingredient stability during processing and storage.
Aims: To address this need, this study aimed to design and characterize a novel cheesecake recipe enriched with anthocyanins, betacyanins, and phycocyanin while investigating the stability of these functional ingredients in relation to different sweeteners commonly used in confectionery.
Materials and Methods: The cheesecakes were formulated using various sweeteners, including sucrose, fructose, sorbitol, and xylitol. The samples were investigated for nutritional composition using AACC methods, and sensory analysis was performed using a quantitative descriptive analysis approach. Microbiological safety was assessed through comprehensive analysis, and the phytochemical stability of pigments was evaluated by extraction and spectrophotometric methods.
Results: The results showed that the stability of anthocyanins, betacyanins, and phycocyanin varied significantly depending on the type of sweetener used. Sugar alcohols such as sorbitol and xylitol demonstrated superior protective effects, maintaining higher pigment concentrations and color intensity than sucrose and fructose.
Conclusion: In conclusion, the choice of sweetener in cheesecake formulations significantly affects the stability of biological compounds.

Keywords: bioactive compounds, cheesecake, sensory analysis, sweeteners, phytochemical stability.

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LACTOBACILLUS PLANTARUM ADAPTABILITY ON SWEET POTATO SUBSTRATES

Cristina CHIOREAN[1], Adriana PĂUCEAN[2], Carmen POP[2], Rodica SIMA[1], Alexandru APAHIDEAN[1] and Simona CHIȘ[2]

[1]Faculty of Faculty of Horticulture and Business in Rural Development, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania
[2] Faculty of Food Science and Technology, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania
*Corresponding author, email: simona.chis@usavcluj.ro

Introduction: Sweet potato (*Ipomoea batatas*), or Batata, is a plant from the *Convolvulaceae* family with root colors ranging from white to orange or purple and with a unique chemical composition, texture, and taste. *Lactobacillus Plantarum* ATCC 8014 is a versatile bacterium with a wide range of applications in food production and human health.
Aims: This research aimed to evaluate the adaptability of the *Lactobacillus Plantarum* ATCC 8014 strain on the fermentation of sweet potato substrates.
Materials and methods: The fermentation process was monitored on three experimental variants: a substrate of 100% yellow sweet potato flour (P1), a substrate of 100% purple sweet potato flour (P2), and a mixed substrate of equal parts of yellow sweet potato flour and type 650 wheat flour (P3). Samples were withdrawn at different fermentation times (0, 12, 24, 48 hours) and pH, total titratable acidity (TTA), and cell growth were measured according to the methods described by (Chiş *et al.* 2020).
Results: P3 sample showed a more pronounced decrease in pH, indicating faster acidification, and consequently had the highest increase in TTA value, especially noticeable after 12 hours of fermentation. Almost the same trend was observed in P1 and P2 samples. With respect to cells growth, the best adaptability was highlighted by P3 sample.
Conclusions: This research demonstrates that *Lactobacillus Plantarum* ATCC 8014 strain can growth on sweet potato substrates with positive influence on pH and TTA values.

Keywords: fermentations, lactic bacteria, sweet potato.

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PARTIAL LEAST SQUARES DISCRIMINANT ANALYSIS (PLS-DA) MODEL FOR EGGS DIFFERENTIATION ACCORDING TO HEN'S GROWING SYSTEM

Gabriela CRISTEA[1], Adriana DEHELEAN[1], Ariana-R. HATEGAN[1] and Romulus PUȘCAȘ[1]

[1]*National Institute for R&D of Isotopic and Molecular Technologies, Cluj-Napoca, Romania*
[*]Corresponding author, e-mail: gabriela.cristea@itim-cj.ro

Introduction: The egg is one of the most nutritious staple foods, due to its nutritional and biological value, being a source of protein, fat, and minerals. Eggs are a low-cost source of protein, cheaper than other types of protein. The notion of quality associated with the origin of the product and the way the chickens were raised appeared.
Aims: The aim of this study was to develop PLS-DA models to differentiate the edible egg parts (egg white and yolk) coming from two hen's rearing systems (yard backyard and barn industrial farms), considering both isotopic and elemental composition of egg constituents.
Materials and Methods: Isotope Ratios Mass Spectrometry (IRMS) and Inductively Coupled Plasma – Mass Spectrometry (ICP-MS), followed by statistical data treatment were corroborated for tracing the animal's diet and growing regime.
Results: The variables that were identified as having the highest differentiation potential, both for egg white and yolk samples, were: $\delta^{13}C$, Li, B, Mg, K, Ca, Mn, Fe, Co, Zn, Rb, Sr, Mo, Ba, La, Ce, Pb. As cereals constitute an important part in the poultry diet, and grains contain a low content of B, it is recommended for hen's feed. Also, the lying hen's diet must be enriched with vitamins, minerals, enzymes, and amino acids. In general premixes are used, which for laying hens must include Zn, Fe, Mn. Thus, is not surprising to obtain these elements as principal markers of differentiation for laying hen's rearing system.
Conclusion: In order to differentiate the hen eggs coming from the backyard rearing system from those originating from barn system, differentiation models based on PLS-DA were developed. Building on the most significant features identified, PLS-DA led to a total accuracy score of 96% for egg white classification according to the hen's rearing system. Regarding yolk samples, based on the most important differentiation markers, a percentage of 100% was obtained.

Keywords: chemometrics, elemental content, egg white, stable isotopes, yolk

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THE ROLE AND IMPACT OF NUTRACEUTICALS IN THE MANAGEMENT OF METABOLIC SYNDROME: AN INTEGRATED APPROACH

Cristina Georgiana MARCHIȘ[1,2], Călina CIONT (NAGY)[1,2], Ramona SUHAROSCHI[1,2] and Oana Lelia POP[1,2*]

[1]*Department of Food Science, University of Agricultural Sciences and Veterinary Medicine, 400372, Cluj-Napoca, Romania*
[2]*Molecular Nutrition and Proteomics Laboratory, Institute of Life Sciences, University of Agricultural Sciences and Veterinary Medicine, 400372, Cluj-Napoca, Romania*
[*]Corresponding author, e-mail: oana.pop@usamvcluj.ro

Introduction: Nutraceuticals, combining "nutrition" and "pharmaceutical," are foods or ingredients with medicinal benefits that support normal body functions. They improve health and help prevent diseases like diabetes, cancer, cardiovascular conditions, and obesity. Metabolic syndrome (MS), or syndrome X, includes central obesity, high blood sugar, cholesterol, and atherosclerosis, increasing the risk of hypertension, heart disease, and stroke, leading to higher morbidity and mortality.
Aims: This study aims to explore the role of nutraceuticals in managing metabolic syndrome, focusing on their potential to improve clinical and biochemical outcomes in patients.
Materials and Methods: A systematic literature review was conducted by analyzing studies from electronic databases including PubMed, Scopus, Web of Science, Cochrane Library, and Google Scholar. The search terms used were “nutraceuticals,” “metabolic syndrome,” “insulin resistance,” “obesity,” “omega-3,” “polyphenols,” and “cardiovascular health.”
Results: The review identified several compounds beneficial for managing metabolic syndrome and obesity, such as antioxidant vitamins (C and E), flavonoids, vitamin D, conjugated linoleic acid, omega-3 fatty acids, chromium, magnesium, alpha-lipoic acid, phytoestrogens, and dietary fibers. These compounds aid in improving both clinical and biochemical outcomes related to metabolic syndrome (Sharma et al., 2016; Pérez-Sánchez *et al.*, 2018; Shenoy *et al.*, 2022).
Conclusion: Numerous nutraceuticals have been demonstrated to effectively address the underlying mechanisms of metabolic syndrome and related conditions, such as diabetes and obesity. These nutraceuticals improve various clinical and biochemical markers, making them useful in clinical practice for disease management and prevention.

Keywords: cardiovascular disease, nutraceutical, nutrition, obesity, prevention

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IMPACT OF TECHNOLOGICAL PARAMETERS IN EXPANDED RICE PRODUCTS

Mădălina O. MARINCAȘ[1], Romina A. MARC*[1] and Crina C. MUREȘAN[1]

[1]*Faculty of Food Science and Technology, University of Agricultural Sciences and Veterinary Medicine, Cluj-Napoca, Romania*
*Corresponding author, e-mail: romina.vlaic@usamvcluj.ro

Introduction: White rice is the predominant type of rice cultivated. These grains are commonly consumed in their natural state, cooked, expanded, extruded or for alcohol. Expanded rice is a snack with high carbohydrate content, making it an excellent source of energy. The process of expanding rice does not necessitate substantial expenses (Saha and Roy 2022). The physiochemical properties that affect the quality of puffing are the amount of amylose, protein, moisture, and the level of gelatinization (Kamaraddi and Prakash 2015).
Aims: Considering the technological parameters of wheat puffing as control sample, we deducted 8 samples for puffing of rice. We considering that expanding ratio is produced at higher pressure and duration of expansion than wheat. Among different strategies to increase production rate, we analyzed chemical and physical profile to compare the samples.
Material and Methods: Rice was delivered by SC Scotti SRL. Expanded rice was made in puffing gun at SC Boromir SRL, Romania. The measurements were done in Laboratory of Quality and Food Safety from Faculty of Food Science and Technology from Cluj-Napoca. We analyzed chemical, physical profile and popped volume expansion.
Results: Correlating their chemical and physical properties of expanded rice it could had been seen at lower pressure and short expansion time than control sample were seen unexpanded grains and bulks, on the other side, the popped grains where burned. At chemical level could not be seen differences. Ash, humidity, texture and expansion ration were proper at the samples with higher pressure and lower time.
Conclusion: In the present research work, we demonstrated that pressure and time have an influence on the quality and expansion of rice.

Keywords: chemical composition, expanding ratio, expended rice

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INVESTIGATION OF PHYTOCHEMICAL COMPOUNDS IN APPLE FRUIT FROM WILD SPECIES, TRADITIONAL AND MODERN VARIETIES USING ADVANCED ANALYTICAL TECHNIQUES

Alexandra Mădălina MATEESCU[1]*, Andruța E. MUREȘAN[1], Vlad MUREȘAN[1], Radu E. SESTRAS[2], Adriana F. SESTRAS[2], Sevastița MUSTE[1], Adriana PĂUCEAN[1] and Marcel DUDA[3]

[1] Faculty of Food Science and Technology, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, 3–5 Calea Mănăștur Street, 400372 Cluj-Napoca, Romania
[2] Faculty of Horticulture, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, 3–5 Calea Mănăștur Street, 400372 Cluj-Napoca, Romania
[3] Faculty of Agriculture, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Calea Mănăștur 3-5, 400372 Cluj-Napoca, Romania
*Corresponding author, e-mail: alexandra.mateescu@usamvcluj.ro

Introduction: Apples are globally popular for their sweet taste and crisp texture, making them the second most produced fruit tree crop in 2020 with 86.44 million metric tons, behind bananas and ahead of oranges. They are a year-round staple in European stores, offered in various cultivars. The cultivated apple (*Malus* × *domestica* Borkh.), likely from interspecific hybridization, includes around 10,000 cultivars in the European Apple Inventory, showing wide variability in quality.
Aims: This study uses chemometric analysis to classify 22 apple genotypes by texture and physicochemical qualities, offering finer distinctions than traditional descriptors.
Materials and Methods: Twenty-two apple genotypes with varying textures, colors, and chemical compositions, suitable for different uses, were selected. Physicochemical attributes were measured using standard methods for fruit mass, volume, moisture, total soluble solids, and titratable acidity. Color was assessed with a portable colorimeter, and texture was analyzed with a Brookfield Texture Analyzer. Statistical analyses included ANOVA, PCA, and HCA.
Results: The 22 selected apple genotypes exhibited significant variability in fruit quality traits. Mean water content was 85.05% (CV 2.74%), ash content 2.32% (CV 22.1%), and total soluble solids 16.22% (CV 17.78%). Large differences were observed for fruit weight, volume, and titratable acidity (means: 119.52 g, 155 mL, 0.55% malic acid; CVs: 35.17%, 34.58%, 54.3%). Peel hardness ranged from 3.80 to 13.69 N, toughness from 0.2 to 1.07 mm, flesh hardness from 0.97 to 4.76 N, and hardness work from 6.88 to 27.84 mJ. These findings highlight the potential for selecting suitable apple cultivars for crossbreeding, helping breeders choose parent plants. Multivariate analysis effectively assessed relationships among *Malus* genetic resources.
Conclusion: PCA identified four clusters based on texture and physicochemical qualities: Cluster I had the smallest fruits, Cluster II had medium-sized fruits with low texture values, Cluster III had the largest fruits with medium texture values, and Cluster IV had the hardest peel and flesh. The study shows that PCA and cluster analysis effectively classify apple genotypes and reveal similarities, aiding in comparing the 22 genotypes.

Keywords: apple quality; apple genotype classification; apple textural attributes.

CITRUS ESSENTIAL OILS NANO-EMULSIONS: FROM A TOXICOLOGICAL POINT OF VIEW

Mădălina MEDELEANU[1*], Antonio CASCAJOSA[3], Silvia PICHARO[3], Ana Belen CEREZO[3], Giorgiana CĂTUNESCU[2] and Sonia Socaci[1]

[1]*Faculty of Food Science and Technology, University of Agricultural Sciences and Veterinary Medicine, Cluj-Napoca, Romania*
[2]*Faculty of Agriculture, University of Agricultural Sciences and Veterinary Medicine, Cluj-Napoca, Romania*
[3]*Faculty of Pharmacy, University of Seville, Spain*
[*]Corresponding author, e-mail: madalina.medeleanu@usamvcluj.ro

Introduction: Ten principal compounds identified in bergamot, lemon, orange and tacle® essential oils nano-emulsions were selected for a comprehensive toxicological evaluation: sabinene, *γ*-terpinene, *α*-terpineol, *β*-linalool, *β*-cis-ocimene, linalool acetate, *α*-terpinene, *o*-cymene, terpinolene, and methyl *m*-methyl anthranilate.
Aims: This work establishes if the CEO-NEs can be used as a food additive based on their chemical fingerprint.
Materials and Methods: The effects of the compounds found in CEO/CEONEs significantly differ based on their chemical structure, leading to considerable variability in absorption, distribution, metabolism, and excretion/toxicity. Determining and measuring the metabolic profile of these drugs will facilitate comprehension of their detrimental consequences. In silico (Biotransformer 3.0, ADMET Lab, PASS online) and in vitro (Ames assay, Micronucleus assay) methods were used.
Results: Biotransformer 3.0 predicts 22 metabolites from sabinene, 14 from g-terpinene, and 30 from a-terpineol. According to PASS Online, the analysed compounds have low gastrointestinal absorption. Among the examined toxicological consequences, sabinene metabolites exhibited the greatest likelihood of respiratory toxicity, succeeded by carcinogenicity, AMES toxicity, and skin sensitization. The results obtained from Ames and Micronucleus assays were in the range recommended by OECD.
Conclusion: The results obtained *in vitro* confirmed the results from *in silico* analysis. EO nano-emulsions did not present genotoxic or mutagenic problems within the tested concentration range (0.3-5%) for mutagenicity and (0.001-0.023%) for genotoxicity.

Keywords: essential oils, food additives, *in silico*, risk assessment

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Acknowledgments: This work was supported by grants from the National Authority for Scientific Research and Innovation, CNCS-UEFISCDI, project number PN-III-P1-1.1-TE-2021-1585, and EUBA-EFSA-2022/ENREL-02–GA12;Selection of hosting sites and fellows for EFSA's European Food Risk Assessment Fellowship Programme.

DESIGNING THE TECHNOLOGICAL PROCESS FOR PRODUCING CHOCOLATE BONBONS WITH MARZIPAN USING PETRI NETS

Ion Dan MIRONESCU[1*], Ioana PICIU[1] and Monica MIRONESCU[1]

[1]*Faculty of Agricultural Sciences Food Industry and Environmental Protection, University Lucian Blaga of Sibiu, Romania*
[*]Corresponding author, e-mail: ion.mironescu@ulbsibiu.ro

Introduction: Almonds are an important source of nutrients and offer numerous health benefits to consumers and can be used to obtain marzipan. Modelling the process of producing chocolate bonbons with marzipan core (CBM) can be useful in gaining a deep understanding of the production flow and interactions between the operations.
Aims: The research aims to optimize the technology for producing CBM to achieve the highest possible number of finished pieces per time unit, streamline the time during a production cycle, and minimize energy consumption. Taking into account current regulations regarding the increase of Romanian taxes for food containing more than 10 grams added sugar/100 grams of product, we propose a new recipe for producing CBM with erythritol.
Materials and Methods: Sugar was replaced with erythritol in the receipt for marzipan. Erythritol is a synthetic sweetener with moderate sweetening power and low caloric content i.e. a healthier alternative to sugar. Petri nets were used as a discrete event modelling and simulation method. Petri nets use token flowing through the nodes of a bipartite graph to visually describe the structure and behaviour of the modelled system
Results: Two recipes for marzipan were chosen, one for sugar-based and the other for erythritol-based, based on the sensorial acceptance of the consumers; then, the recipe necessary to obtain the CBM and the optimal ratios between the ingredients were established, and were then used in the simulation. The processing options determined through simulation, resulted in the increase of productivity without modifying the production line and the consequent reduction of the production costs. Thus, at the end of an 8-hour norm, 4000 CMB, respectively 400 bags of the finished product, were obtained.
Conclusion: Petri nets can be used, to simulate the technology of obtaining CBM starting from the raw material, namely almonds. Modelling and simulation are an effective tool for the improvement of the operation of complex technological processes that are not suitable for the use of classical mathematical optimisation methods

Keywords: chocolate, erythritol, marzipan, Petri nets, simulation.

USE OF CHOCOLATE AS SUPPORT FOR NATURAL BIOACTIVE INGREDIENTS

Monica MIRONESCU[1*], Ciprian JOSAN[1], Ion Dan MIRONESCU[1], Cecilia GEORGESCU[1], Szintia JEVCSAK[2] and Endre MATHE[2]

[1] *Faculty of Agricultural Sciences Food Industry and Environmental Protection, University Lucian Blaga of Sibiu, Romania*
[2] Faculty of Agricultural and Food Sciences and Environmental Management, Institute of Food Technology, University of Debrecen, Hungary
[*]Corresponding author, e-mail: monica.mironescu@ulbsibiu.ro

Introduction: Chocolate can be used as support matrix for bioactive ingredients, due to the technology, its sensory acceptance and the protective effect on bioactive compounds during digestion; one of the advantages of using chocolate as a carrier for the release of bioactive compounds is that it can mask off-flavours (Faccinetto-Beltrán *et al.*, 2021).
Aims: In this research, a large number of natural compounds are tested in chocolate, as powders and extracts, in order to appreciate their influence on the chocolate main characteristics.
Materials and Methods: Powders derived from dried plants (moringa, matcha), algae (spirulina), seeds (hemp seeds and malt), and extracts (strawberry aqueous extract, hemp oil, thyme, and dill essential oils) were used. Dark chocolate was obtained in the lab. The chocolate containing different contents of each of these compounds (from traces to 3%) was analysed at the sensorial level, flavonoid and polyphenols content, antioxidant action (DPPH), rheological behaviour.
Results: All products can be sensorial accepted by the consumers; the quantity to be added depends on the type of additive: aqueous extracts can be used in concentrations no higher as 1.5%, whereas the plants are accepted in higher concentrations (3%) and essential oils in very small amounts (traces). All products tested show high flavonoid and polyphenols content and antioxidant activity. Viscosity curves show that chocolate with different additions has a pseudoplastic behaviour with flow limit.
Conclusion: In the present research work, we demonstrated that chocolate can be successfully used as career for different natural bioactive compounds, with enriching the health-related characteristics and with enlarging the product range.

Keywords: antioxidant, bioactive, chocolate, rheology

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IMPACT OF ACID AND ALKALINE PRETREATMENTS ON WHEAT BRAN NUTRITIONAL QUALITY AND BIOACTIVITY

Silvia-Amalia NEMES[1], Bernadette-Emőke TELEKY[1], Lavinia-Florina CĂLINOIU[1], Deborah-Gertrude-Alice ELEKES[2], Diana PLĂMADĂ[1], Anca Corina FARCAȘ[1], Răzvan ODOCHEANU[1], Laura MITREA[1], Mihaela Stefana PASCUTA[1], SZABO Katalin[1], Anita VARVARA[1], Bianca STEFANESCU[1], Ana-Maria COCEAN[1], Adrian Gheorghe MARTAU[1], Francisc-Vasile DULF[2] and Dan-Cristian VODNAR[1]*

[1] *Food Science and Technology, University of Agricultural Sciences and Veterinary Medicine, Cluj-Napoca 400372, Mănăștur 3-5, Romania*
[2] *Faculty of Agriculture, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca*
*Corresponding author, e-mail: dan.vodnar@usamvcluj.ro

Introduction: The processing of wheat bran (WB) through chemical treatments, such as acid and alkaline pretreatments, can significantly modify its nutritional and bioactive properties. Understanding these changes is essential for developing sustainable methods to utilize WB in producing health-beneficial compounds.
Aims: This research aims to systematically investigate the effect of chemical processing technology, such as acid and alkaline pretreatment, on the phenolic profile, lipid components, and protein composition in WB.
Material and Methods: WB samples underwent acid and alkaline pretreatments. The TRS, phenolic content, antioxidant potential (via the DPPH assay), HPC, and fatty acid profile were analyzed. Identified sugars, phenolic compounds, and fatty acids were documented and compared between treated and untreated samples.
Results: Acid pretreatment resulted in over a twofold increase in TRS, identifying maltose, glucose, and fructose. Total phenolic content rose by 41.95% compared to untreated samples. Antioxidant potential increased significantly from 95.08 ± 1.13 μM TE/g DW in untreated samples to 575.83 ± 2.41 μM TE/g DW after acid pretreatment. Alkaline treatment increased total HPC from 4.01 ± 0.17 mg/100 g DW to 16.58 ± 0.38 mg/100 g DW. The fatty acid profile showed oleic acid (C18:1, n-9), linoleic acid (C18:2, n-6), and palmitic acid (16:0) as major components. Both treatments significantly affected all 13 identified phenolic compounds, including avenanthramides, cinnamic acids, and benzoic acids.
Conclusion: Chemical pretreatments significantly enhance the bioactive properties of WB, making it a valuable resource for developing sustainable and health-promoting bioactive compounds. These findings contribute to the comprehensive utilization of cereal bran in functional food applications.

Keywords: antioxidant activity, chemical processing, cereal by-product, polyphenols, *Triticum aestivum L.*

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FREQUENCY OF *E. COLI* IN MILK AND DAIRY PRODUCTS

Lucia Elena PANAIT[1*] and Roxana VIDICAN[1]

[1*]*Faculty Agriculture, University of Agricultural Sciences and Veterinary Medicine, Manastur Way 3-5, Cluj-Napoca, 400372, Romania*
[*]Corresponding author, e-mail: lucia.panait@usamvcluj.ro

Introduction: In the large intestine, the microbiota achieves high densities, 99% of the component bacteria being anaerobic (hundreds of species, few of which are cultivated and identified (Laidler *et al.*, 2013).
Aims: The purpose of this article is to discuss the bacteria that colonize the intestinal flora, that can be found in milk and dairy products.
In humans and animals, the microbiota is made up of microorganisms that populate the skin, cavities, vagina, or digestive and respiratory tract, making populations with a very high density of *Lactobacillus, Bacteroides, Candida, Streptococcus, and Escherichia* (Roshan *et al.*, 2020; Ababu *et al.*, 2020).
Materials and Methods: For the studies performed, samples were taken from milk and dairy products from 2 types of factories and the frequency of germ growth on the culture medium was monitored **.**
Results: Production conditions can contaminate dairy products due to improper hygiene of industrial equipment or humans. In conclusion to obtain a product with a minimal bacterial requires a very rigorous monitoring of the production flow.
Conclusion: Because of this study, we came to the conclusion that hygiene in a milk processing factory it's crucial in order to avoid any contamination and anihilate any sources of infection from the very first stages of milk processing and further until acquiring the final products.

Keywords: bacteria, dairy products, microbiota, microorganism

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NUTRITION IN THE CONTEXT OF SUSTAINABILITY: THE IMPACTS OF THE PLANT-BASED DIETS

Andreea PAVEL[1*], Mădălina CHIOREAN[1] and Ramona SUHAROSCHI[1]

[1] *Department of Food Science, Faculty of Food Science and Technology, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Cluj-Napoca, Romania*
[*]Corresponding author, e-mail: andreea-fulvia.pavel@student.usamvcluj.ro

Introduction: The European Commission articulates the principle of sustainable development as fulfilling the necessities of the current generation without impeding the capability of future generations to fulfil their requirements. The domain of sustainable nutrition is characterized by the adoption of dietary practices that yield notable health advantages alongside fostering environmental conservation and promoting both social equity and economic viability. In the past few years, the interest in plant-based diets has markedly increased within both the general population and the scientific community. This surge in popularity is driven by a blend of historical, ethical, and empirical factors, alongside the recognition of the economic, socio-cultural, environmental, and health benefits associated with diets rich in plant-derived foods.
Aims: This review aims to systematically identify and delineate the environmental impacts, socio-cultural aspects, and health implications of plant-based diets within the framework of sustainable development.
Materials and Methods: This review comprehensively examines the scientific literature to analyse the implications of nutrition and the advantages of adopting plant-based diets in the context of sustainability.
Results: This review's results highlight that plant-based diets offer significant environmental, economic, social, and health benefits, contributing positively to all pillars of sustainable development.
Conclusion: In the present review, we presented the current knowledge on the multifaceted benefits of plant-based diets in relation to sustainable development. The evidence underscores that plant-based dietary patterns can substantially enhance environmental sustainability, economic efficiency, social equity, and public health. By integrating findings across various domains, this review illustrates how transitioning to plant-based diets can address pressing global challenges and support the overarching goals of sustainability.

Keywords: plant-based diets, sustainable development, sustainable nutrition

MAPPING THE INTERPLAY BETWEEN PHENOLIC COMPOUNDS, GUT MICROBIOTA, AND BIOTRANSFORMATION

Diana PLĂMADĂ[1], Bernadette-Emőke TELEKY[1], Silvia Amalia NEMEȘ[1,2], Laura MITREA[2], Katalin SZABO[2], Lavinia-Florina CĂLINOIU[2], Mihaela Stefana PĂȘCUȚA[1], Rodica-Anita VARVARA[1], Călina CIONT (NAGY)[1], Ana-Maria COCEAN[1], Răzvan ODOCHEANU[1], Gheorghe Adrian MARTĂU[1,2], Francisc Vasile DULF[3] and Dan Cristian VODNAR[1*]

[1]*Life Science Institute, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, 400372 Cluj-Napoca, Romania*
[2]*Faculty of Food Science and Technology, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Calea Mănăștur 3-5, 400372 Cluj-Napoca, Romania*
[3]*Faculty of Agriculture, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Calea Mănăștur 3-5, 400372 Cluj-Napoca, Romania*
[*]Corresponding author, e-mail: dan.vodnar@usamvcluj.ro

Introduction: This *in vitro* study explored the health benefits of freeze-dried apple pomace from Red Delicious and Granny Smith apples, focusing on its impact on gut microbiota and overall health.
Aim: The research aims to ascertain the prebiotic index of the identified phenolic compounds, offering a nuanced understanding of their ability to stimulate the growth and activity of beneficial gut microorganisms selectively.
Materials and Methods: Apple pomace was processed, phenolic compounds were extracted and analyzed by HPLC, and *in vitro* digestion was simulated. Sugars were quantified before and after digestion using HPLC, antioxidant activity was assessed by DPPH, and prebiotic potential was evaluated through fermentation with probiotic and enteric strains.
Results: Red Delicious had the highest phenolics (13.81 mg GAE/g), primarily procyanidins and epicatechin, and the most glucose and fructose, which decreased during digestion. It showed the strongest antioxidant activity and prebiotic potential, especially at 1% concentration. These findings highlight the specific health benefits of apple pomace and its interaction with gut bacteria.
Conclusion: Overall, the study provides valuable insights into apple pomace's bioaccessibility, functionality, and potential for promoting gut health through prebiotic effects. This paves the way for further exploration of its nutritional value.

Keywords: apple pomace, gut microbiota, phenolic compounds

THE FUNCTIONALITY OF A MIXTURE OF PEA/SOY PROTEIN ISOLATES AND GUMS AS AFFECTED BY THERMAL DENATURATION IN DEVELOPING FAT REPLACING SYSTEMS

Andreea PUȘCAȘ[1], Anda Tanislav[1], Anca Fărcaș[2], Andruța MUREȘAN[1] and Vlad MUREȘAN [1]*

[1]Food Engineering Department, [2] Department of Food Science,
University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania
Corresponding author, e-mail: vlad.muresan@usamvcluj.ro

Introduction: Emulgels can be designed by emulsionating hydrogel (Hy) with oils. They are a step in designing oleogels in the indirect path. Emulgels, along with oleogels, are systems used to replace saturated fats and for obtaining low-fat products.
Aims: To evaluate the influence of thermal treatment on the structure of Hy obtained with ternary systems of proteins (2%), guar gum (0.5%) and xanthan gum (0.5%), on the emulgels and on the oleogels.
Materials and Methods: FTIR spectra, turbidity, rheology, and Hy's texture were determined. To change the functionality or the interaction of pea (P) or soy (S) protein with gums, hydrogels were subjected to thermal denaturation (D) (70ºC- 20 min. or 85ºC -15 min.) or not (ND), Emulgels were obtained using the Ultraturrax at 13500 rpm/8 min., from Hy mixed with 40% or 60% sunflower oil.
Results: FTIR revealed protein-polysaccharide interactions, turbidity test confirmed that for SD70 and PD85. PD85 and PD70 formed stronger gels (G‘- 464.81 Pa and 127.35 Pa, respectively). Hy from soy were weaker, but with higher stability to shear and with no G cross-over point (where G″ > G'). At low shear rates, SND presented higher values of viscosity, followed by SD70 and SD85, while in the entire share rate domain, for pea-based hydrogels, a similar hierarchy was obtained. In terms of emulsions, SND_40%, PD85_40% and PD85_60% presented higher values of hardness. Samples presented high cohesiveness. In terms of adhesive force, PD85_40% and PND_40% registered lower values of adhesive force, which is desirable for the application of emulsions in foods.
Conclusion: Tuned properties through thermal denaturation of hydrogels were obtained for hydrogels and emulgels. Oven drying is conducted to oleogels, but is not economically feasible, freeze drying leading to higher oil fractions in the sample.

Keywords: emulgels, hydrogels, oleogels, protein denaturation

ACORNS (*QUERCUS* SPP.) - CHEMICAL AND STRUCTURAL INSIGHTS

Eugen Dan RADU[1], Teodora Emilia COLDEA[1], Vlad MUREȘAN[1], Corina Maria ȘUTEA[1], Edward MUNTEAN[1], Floricuța RANGĂ[1], Dorina SIMEDRU[2] and Elena MUDURA[1*]

[1]Faculty of Food Sciences and Technology, University of Agricultural Sciences and Veterinary Medicine, 400372 Cluj-Napoca, Romania
[23]INCDO-INOE2000, Subsidiary Research Institute for Analytical Instrumentation Cluj-Napoca, 400293 Donath 67, Cluj-Napoca, Romania
*Corresponding author, e-mail: elena.mudura@usamvcluj.ro

Introduction: Acorns are commonly known as the fruit of trees within the *Quercus* genus witch is composed of over 600 species of woody angiosperms distributed across various habitats in the northern hemisphere. Acorns are now uncommon in the human diet, being used just in some traditional Mediterranean recipes, mainly as flour for cakes and breads. However, acorn flour has attracted growing interest in scientific studies as it has been employed as a component in various food items.
Aims: The objective of this study is to provide a detailed description of the acorns from the Northern red oak (*Quercus rubra*) and English oak (*Quercus robur*) species, as well as the starch found within their structure, in order to provide a valorisation perspective of this sustainable forest product.
Materials and Methods: To achieve the objective, various analyses were conducted on acorns, including standard physico-chemical determination, total starch content, simple carbohydrates by HPLC, and determination of β-glucan using enzymatic analysis. The starch obtained from the acorn matrix was used to conduct rheological measurements, determine water and oil absorption capacities, evaluate water solubility index and swelling power, and establish gelation temperature. The structure of starch granules was determined using polarized light microscopy and scanning electron microscopy, while the crystallinity of the granules was determined using X-ray diffraction.
Results: The results regarding *Quercus robur* showed values of 33.09% moisture, 3.12% ash, 3.59% protein, 38.05% starch, 5.70 pH, 0.005 mg/g extract maltose and 0.347mg/g glucose, while the dimensions of the starch granules range from 17.26 – 159.54 μm^2 for the area, 4.04 – 21.04 μm for the length and 3.57 – 11.76 μm for the width. Analysis of the images captured by SEM revealed circular and elongated starch granules in *Quercus rubra* and irregular shapes in *Quercus robur*.
Conclusion: Based on the obtained results, it can be concluded that acorns can be effectively valorize by using their starch as a nutritional source in food, for producing biofilm, or to obtain the fermentable substrate utilized in the alcohol industry.

Keywords: acorn, *Quercus,* starch, valorization

VALUE ADDED PROCESSES FOR CIRCULAR FOOD ECONOMY IN THE FRUIT SECTOR

Steliana RODINO[1,*]

[1]*Institute of Research for Agriculture Economy and Rural Development, Bucharest, Romania*
[*]Corresponding author, e-mail: steliana.rodino@yahoo.com

Introduction: The sustainable development of the food industry through the circular economy approach is related to managing the waste associated with food production.
Aims: The present paper reviews the potentials of byproducts and waste valorization connected with fruit species as a source for developing value-added products, such as food ingredients, biofuels, and biodegradable packaging materials.
Materials and Methods: The study involved an analysis of available technologies for extracting bioactive compounds and dietary fiber from fruit by-products. The use of fruit sector waste and byproducts as raw materials for biofertilizers and biofuels was also investigated.
Results: The analysis has demonstrated the positive impact of the approaches to valorification of by-products from fruit sector on the overall production process efficiency. The drivers and enablers with regard to the implementation of such practices in the food sector were discussed, primarily because the circular economy paradigm shift to achieve the overall goal of the model depends greatly on close cooperation between research, industry, and public policies for its implementation.
Conclusion: The valorisation of fruit sector by-products and waste is involving multiple technologies for increasing of the efficiency and sustainability of the food production process. To sustain such an approach, a key element is establishing a science-policy-industry dialogue in advancing and promoting good practice models of the circular economy.

Keywords: circular active processes, economic efficiency, fruit byproducts valorisation, food production waste, value added products

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ARGUMENTS FOR THE CONTINUITY OF MEAT PRODUCTION IN CONDITIONS OF CLIMATE CHALLENGES

Steliana RODINO[1*], Rodica CHETROIU[1*] and Lidia IURCHEVICI[1]

[1,] *Research Institute for Agriculture Economy and Rural Development, 61 Marasti Blvd, District 1, Bucharest, Romania*
[*]Corresponding authors, e-mail: steliana.rodino@yahoo.com and rodica.chetroiu@iceadr.ro

Introduction: Currently, society is faced with a whole series of challenges, including those related to securing food resources (El Bilali *et al.*, 2019). In Romania, farmers in the meat production sector operate in a competitive economic environment, to which are added the climatic challenges related to the provision of the most important inputs for animal production, which are the forages (Kipling *et al*., 2016).
Aims: The aim of the present work is to bring arguments for the continuity of meat production, using alternatives to ensure fodder resources for beef production activity, in drought conditions, with fodder resilient to low hydrological regimes.
Materials and Methods: Thus, considering a young bull fattening farm, fodder rations adapted to climate change conditions were developed. These rations were optimized both in terms of covering the energy and protein requirements for animal maintenance and meat production and, from an economic point of view, in the sense of obtaining positive economic results and calculating profitability indicators for meat production.
Results: The results of the calculations, by different technical-economic indicators, showed that by using in the farm fodder adapted to the conditions of climate change, the beef production activity can obtain profitability.
Conclusion: In the present research, we demonstrated that continuity of meat production in climate change conditions can be ensured by properly managing inputs and adapting fodder to the current environmental and climate conditions.

Keywords: economic, farm, food, forages, profitability

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FATS EXTRACTED FROM OIL PRESS CAKES, FISH MEAT, AND CHICKEN HEARTS AS POTENTIAL COQ10 SUPPLEMENTS

Cristina Anamaria SEMENIUC[1]*, Mara MANDRIOLI[2], Andersina Simina PODAR[2], Floricuța RANGA[1], Maria Ioana SOCACIU[1], Simona Raluca IONESCU[1], Melinda FOGARASI[1], Anca Corina FĂRCAȘ[1], Tullia Gallina TOSCHI[2], Dan Cristian VODNAR[1] and Sonia Ancuța SOCACI[2]*

[1] *Faculty of Food Science and Technology,University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca, Romania*
[2] *Department of Agricultural and Food Sciences, Alma Mater Studiorum - Università diBologna, Bologna, Italy*
*Corresponding authors, e-mail: cristina.semeniuc@usamvcluj.ro and sonia.socaci@usamvcluj.ro

Introduction: Coenzyme Q10 (CoQ10) is a liposoluble compound naturally occurring in plant and animal cells, with some benefits for health, mainly due to its antioxidant properties. The food industry gives large quantities of by-products and waste; these could be used to recover the natural form of CoQ10, which has a higher bioavailability than synthetic (Semeniuc *et al*., 2024).
Aims: This study aimed to characterise the fats extracted from rapeseed press cakes (RPC), sunflower press cakes (SPC), pumpkin press cakes (PPC), linseed press cakes (LPC), walnut press cakes (WPC), hempseed press cakes (HPC), whole fish (WF), and chicken hearts for their potential use as dietary supplements based on CoQ10.
Materials and Methods: The Folch method modified by Boselli was used to extract fats from these matrices. These were analysed regarding the content in CoQ10, tocopherols, and tocotrienols, cannabinoids (only for HPC fat), main lipid classes, and fatty acids; their antioxidant capacity and oxidative status were also evaluated. Several lipid quality indices were calculated to estimate the benefit-harm balance of each potential dietary supplement.
Results: The highest CoQ10 content was found in fats extracted from chicken hearts-CH (2041.74 μg/g) and pumpkin press cakes-PPC (661.40μg/g). Both vegetable and animal fats are triglycerides but have a low CVD risk (AI values below the recommended limit). CH fat is dominated by oleic acid (*n*-9) and PPC fat by linoleic acid (*n*-6). PUFAs/MUFAs ratio is above the recommended minimum in both fats; however, the *n*-6/*n*-3 PUFAs ratio in CH fat exceeds the maximum value. These fats also contain tocopherols (PPC-138.09 μg/g and CH-54.22 μg/g) that, along with CoQ10, give them antioxidant properties; therefore, they meet the criteria of a food supplement.
Conclusion: The matrices tested in this study represent a source of CoQ10, except for hempseed press cakes and fish meat. Chicken hearts and pumpkin press cakes are the richest in CoQ10.

Keywords: chicken hearts, coenzyme Q10, fats, fish meat, oil press cakes

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FROM ODORANTS TO OFF-FLAVOURS IN BEER: THE MAIN AROMA COMPOUNDS AND STRATEGIES FOR IMPROVEMENT

Corina Maria ȘUTEA[1], Elena MUDURA[1], Carmen Rodica POP[1], Eugen Dan RADU[1], Paul Cristian CĂLUGĂR[1], Ioana DUMITRAȘCU[1] and Teodora Emilia COLDEA[1]*

[1] *Faculty of Food Science and Technology, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Cluj-Napoca, Romania*
*Corresponding author, e-mail: teodora.coldea@usamvcluj.ro

Introduction: Beer aroma plays a vital role in defining the product, alongside appearance, taste, and mouthfeel. For consumers, aroma is deeply connected to emotional responses and memory and pleasant aromas can enhance the drinking experience, while off-flavours may indicate potential quality issues. Pleasant aromas enhance the drinking experience, whereas off-flavours, such as "skunky", "buttery" or "metallic", can signal potential quality issues. Beer consumers have specific preferences for beer aroma, such as "hoppy", "malty", "fruity" or "floral" which can affect their choices.
Aims: This review aims to identify and describe key aroma compounds found in various beer styles. Additionally, it seeks to develop a troubleshooting guide to identify and address common off-flavours and their causes, providing effective solutions to enhance beer quality.
Materials and Methods: This review involved an examination of existing literature on beer odorants. Relevant studies and research papers were analysed to identify key aroma compounds associated with different beer styles. The review also involved synthesising information on common off-flavours, their causes and potential solutions based on previously published findings.
Results: In this review, 27 of the most common aroma compounds that are present in beers were identified from the literature and a troubleshooting guide was developed with the possible causes and practical solutions were provided to address these issues.
Conclusion: This review synthesises current knowledge on the key odorants found in beers, their causes, and possible solutions. By integrating insights from various studies, this review aims to guide brewers and researchers in the industry towards informed decisions and sustainable practices for maximising the quality of beers.

Keywords: aroma compounds, beer, off-flavours, odorants

FERMENTED BEVERAGES WITH FUNCTIONAL POTENTIAL: EXPLORING THE POSSIBLE USE OF GRAPE AND APPLE POMACE IN BEERS

Corina Maria ȘUTEA[1], Elena MUDURA[1], Carmen Rodica POP[1], Eugen Dan RADU[1], Paul Cristian CĂLUGĂR[1], Ioana DUMITRAȘCU[1] and Teodora Emilia COLDEA[1]*

[1] *Faculty of Food Science and Technology, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Cluj-Napoca, Romania*
*Corresponding author, e-mail: teodora.coldea@usamvcluj.ro

Introduction: Fermented beverages have a rich history, playing a significant role in societies worldwide. Today, there is a growing focus on sustainability in the beverage industry, especially through the utilisation of by-products. By-products offer a sustainable approach to creating new products, reducing waste, and enhancing the health benefits and flavour of the final products.
Aims: This review aims to identify by-products from the alcoholic beverages industry and assess their potential and the effects they can have when added to other beverages, such as sour beers.
Materials and Methods: This literature review involved searching relevant scientific databases, including Scopus, ScienceDirect, Google Scholar, and PubMed, for articles related to the use of grape pomace, apple pomace, and their integration into different beer styles. Keywords used in the search included “grape pomace”, “apple pomace”, “fermentation”, “beer”, and “sour beer”.
Results: The literature suggests that incorporating grape and apple pomace into beers is feasible and could enrich the flavour profiles. However, there is a gap in research, as few publications have explored the application of fruit pomace in beers, and none have specifically focused on sour beers with fruit pomace.
Conclusion: This review synthesizes current knowledge on the addition of grape and apple pomace into beer, and based on the literature, the use of these by-products in sour beer production appears to be a promising approach to creating innovative and sustainable beverages. Based on the fruit pomace composition found in literature, incorporating them into sour beers can create fruit sour beers with unique characteristics. Further research is needed to explore and validate these possibilities more thoroughly.

Keywords: fermented beverages, sour beer, grape pomace, apple pomace

COMPARISON OF STRUCTURAL BEHAVIOR IN THE PROCESS DYNAMICS OF THREE DIFFERENT OLEOGEL BASED MEAT PRODUCTS

Anda Elena TANISLAV[1], Anca Alexandra CORNEA[1], Dorin ȚIBULCĂ[1], Maria-Ioana SOCACIU[1], Cristina Anamaria SEMENIUC[1], Francisc DULF[2], Elena MUDURA[1], Vlad MUREȘAN[1*]

[1]Faculty of Food Science and Technology, Department of Food Engineering, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Calea Mănăştur 3-5, 400372 Cluj-Napoca, Romania.
[2]Faculty of Agriculture, Department of Environmental and Plant Protection, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Calea Mănăştur 3-5, 400372 Cluj-Napoca, Romania.
*Corresponding author: vlad.muresan@usamvcluj.ro

Introduction: The vulnerability to develop various medical conditions is enhanced by the higher level of saturated fat content in processed meat products, which can reach up to 30% in emulsified meat products. Although it is difficult to find a good substitute for saturated animal fats, researches on a particular technique known as oleogelation has gained attention.
Aims: This research aimed to evaluate the impact of replacing saturated fat with unsaturated fatty acids through the production of oleogels obtained from sunflower oil and glycerol monostearate/candelilla wax. The substitution effect with oleogels was evaluated during the production of three different types of meat products- Bologna, Traditional Romanian and Frankfurter sausages.
Materials and Methods: The meat composition was subjected to physical analysis (texture profile, emulsion stability, rheological measurements) and the sausages were analyzed both raw and prepared for consumption. The fat from Frankfurter sausages was extracted trough Folch method and analyzed: peroxide index, FTIR spectra, fatty acids.
Results: The results showed that the oleogels were stable and well structured, with an oil loss below 0.8%. Through the lipid reformulation, although the hardness of the meat compositions decreased, did not significantly change their adhesiveness, cohesiveness, and springiness index. The rheological analysis of the meat compositions showed that the storage modulus G′ was higher than the loss modulus G″ and both moduli increased with increasing frequency. Colour results of the cross-section colour indicate the potential for consumer acceptance due to the reduced colour differences between the conventional and oleogel samples. The fat extracted from the Frankfurter cooked sausages presented mainly unsaturated fatty acids: 35.42% MUFA and 38.69% PUFA for glycerol monostearate oleogel and 38.14% MUFA and 42.03% PUFA for candelilla wax oleogel.
Conclusion: Candelilla wax-based oleogels tend to be more appropriate for developing meat products with a reduced saturated fat content, as they possess a higher ability to preserve the characteristics of the conventional product.

Keywords: fat substitution, meat composition, oleogel, stability.

QUALITY AND AUTHENTICITY OF SAFFRON AND SENSORY ASPECTS

Maria Jenica URS[1], Mara MANDRIOLI[2], Cristina Anamaria SEMENIUC[1]* and Tullia Gallina TOSCHI[2]*

[1] *Faculty of Food Science and Technology, University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca, Romania*
[2] *Department of Agricultural and Food Sciences, Alma Mater Studiorum - Università di Bologna, Bologna, Italy*
*Corresponding authors, e-mail: cristina.semeniuc@usamvcluj.ro and tullia.gallinatoschi@unibo.it

Introduction: Saffron (*Crocus sativus* L.) is highly valued for its distinct sensory properties and chemical composition, including bioactive substances such as safranal, picrocrocin, and crocin (Naidis *et al*., 2023). These compounds are responsible for saffron's characteristic aroma, bitterness, and vibrant colour, and they provide health benefits through antioxidant, neuroprotective, and anti-inflammatory effects (Cerdá-Bernad *et al*., 2022). Given saffron's high cost and susceptibility to adulteration, ensuring its quality and authenticity is crucial.
Aims: This review aims to discuss the current classification of saffron and the official methods, often out-of-date, applied for its quality control to prevent fraud; it also proposes feasible and effective alternatives.
Materials and Methods: The Web of Science and Scopus databases were searched using keywords like "saffron," "quality control," "authenticity," and "sensory analysis." Only articles that investigated saffron's quality control methods, authenticity issues, or sensory properties were included, reducing the number of relevant articles to 50 in Web of Science and 37 in Scopus.
Results: Saffron is classified based on its chemical composition and sensory properties. The ISO standards stipulate the quality criteria for this spice, including some parameters such as the moisture and ash content or the absorbance values of safranal, picrocrocin, and crocin. Microscopic examination, colourimetry, and UV/visible spectroscopy are used to assess saffron's purity and authenticity to ensure high standards and prevent fraud. Despite their utility, ISO methods have limitations in detecting sophisticated adulteration. Advanced techniques, while more precise, are not yet standardised.
Conclusion: High-performance liquid chromatography (HPLC) accurately measures safranal and picrocrocin concentrations, surpassing UV-Vis spectrophotometry, often overestimating contents. Gas chromatography-mass spectrometry (GC-MS) identifies crocin and minor metabolites, which is useful for traceability. Headspace solid-phase microextraction coupled with mass spectrometry (HS-SPME/GC-HRMS) can characterise some volatile compounds that are authentication markers. Since these advanced methods provide more precise results, their standardisation would be essential to ensure the quality and authenticity of saffron.

Keywords: crocin, nutraceutical properties, picrocrocin, quality control, safranal, saffron.

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SESSION 4: HORTICULTURE

YEAST'S CONTRIBUTION TO MELATONIN FORMATION FOR BOOST WINE'S NUTRITIONAL VALUE

Valeriu COTEA[1,2,*], Elena Cristina SCUTARAȘU[1], Camelia Elena LUCHIAN[1], Cătălin Ioan ZAMFIR[2], Bogdan Ionel CIOROIU[2], Lucia Cintia COLIBABA[2] and Laurian VLASE[3]

[1]„Ion Ionescu de la Brad" Iași University of Life Sciences, Faculty of Horticulture, Iași, Romania
[2] Research Center of Oenology, Romanian Academy, Iași, Romania
[3] „Iuliu Hațieganu" University of Medicine and Pharmacy, Faculty of Pharmacy, Cluj-Napoca, Romania
[*]Corresponding author, e-mail: valeriu.cotea@iuls.ro

Introduction: Antioxidants are a class of substances that help trap and neutralize free radicals, thereby they can decrease the damage to the body caused by free radicals. Melatonin is a hormone that our brain produces in response to darkness. In plants, melatonin is usually produced from tryptophan, resulting from the conversion of serotonin.
Aims: The current study aims to produce wines with a high antioxidant capacity that complement balanced diets. Accordingly, the goal of the study was to optimize the technology used in the manufacturing of some wines, by observing the impact of various yeasts, both *Saccharomyces* and non-*Saccharomyces*, on the melatonin synthesis.
Materials and Methods: For this experiment, two types of white wines were analysed. The principal phenolic compounds were determined using an Agilent 1100 HPLC Series system (Agilent, USA) coupled with an Agilent Ion Trap VL mass spectrometer (Agilent, USA), following the method of Scutarașu *et al*. (2021). Identification and quantification of melatonin was performed according to the method of Scutarașu *et al*. (2024), with some modifications, using a Transcend XT Ultimate 3000 UHPLC system.
Results: Depending on the type of inoculation yeasts, the examined wine samples displayed varying concentrations of bioactive substances. Depending on the type of inoculation yeasts, the examined wine samples displayed varying concentrations of bioactive substances.
Conclusion: Significant quantities of phenolic compounds were found in wine samples that had greater melatonin contents. Thus, it may be concluded that melatonin's antioxidant qualities support phenolic compounds' stability, preserving both their concentration and biological activity in wine. The value of this compound greatly influenced the rise in antioxidant capacity, despite the fact that it was present in wine, in modest concentrations.

Keywords: bioactive substances, nutritional value of wine, white wines, yeasts

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PLANTS BIOSTIMULANTS AND CIRCULAR ECONOMY IN A CLIMATE CHANGE SCENARIO

Javier ZUZUNAGA ROSAS[1], Monica BOSCAIU[2] and Oscar VICENTE[3]*

[1] Department of Plant Production, UPV, Valencia, Spain
[2] Mediterranean Agroforestry Institute (IAM), UPV, Valencia, Spain
[3] Institute for the Conservation and Improvement of Valencian Agrodiversity (COMAV), Universitat Politècnica de València (UPV), Valencia, Spain
*Corresponding author, e-mail: ovicente@upvnet.upv.es

Climate change is increasingly causing more frequent, intense and prolonged droughts, and also accelerating the salinisation of irrigated cropland, especially in arid and semi-arid regions. This poses a significant threat to global food security, as all our major crops are susceptible to water scarcity and salt stress. Much effort is being invested in the biotechnological improvement of crop drought and salt tolerance by classical plant breeding and genetic transformation or genome editing techniques, with limited success. The so-called plant biostimulants represent a complementary approach to mitigate the adverse effects of environmental stress on crops. Plant biostimulants are a disparate collection of inorganic elements, natural and synthetic organic compounds or mixtures of compounds, biological extracts and beneficial microorganisms, defined by their positive effects on crops, enhancing nutrition efficiency, improving quality traits and boosting tolerance to abiotic stress. One specific class of non-microbial biostimulants, protein hydrolysates, deserve special mention. These complex mixtures of amino acids and oligopeptides are gaining popularity in sustainable agriculture for significantly improving crop yields under stressful conditions like high temperatures, water scarcity, or high soil salinity. Protein hydrolysates are typically produced through the chemical and/or enzymatic hydrolysis of proteins found in by-products, residual sources or wastes from agro-industrial processes. They can be derived from plant materials (crop residues such as seeds, husks, biomass, pomace or fruits) or animal by-products (including blood, feathers, viscera, bones, skins, and other waste). This production process is also relevant from an environmental point of view, contributing to the management and disposal of waste that may be toxic and cause soil and water contamination. Moreover, manufacturing protein hydrolysates for use as plant biostimulants represents a paradigmatic example of a circular economy model, transforming waste into valuable agricultural inputs. In the present work, we demonstrated the beneficial apport that protein hydrolytes used as biostimulant can have on different crops, especially when cultivated in arid and semi-arid regions.

Keywords: agro-industrial waste, drought, food security, protein hydrolysates, salt stress

CONVERSION OF A VASE CANOPY INTO A PLANAR PARALLEL U ONE IN AN ALMOND ORCHARD – PRELIMINARY RESULTS

Mihaela BĂLUȚĂ[1]* and Florin STĂNICĂ

University of Agronomic Sciences and Veterinary Medicine of Bucharest,
59 Mărăşti Blvd, 011464, Bucureşti, Romania
*Corresponding author, email: miha.baluta@yahoo.com

Introduction: The almond (*Prunus dulcis* (Miller) D.A. Webb) is a species that enjoys a real appreciation due to its nutritional properties, showing interest to fruit growers. This makes it necessary to adopt modern culture technologies.
Aims: It was investigated if the species benefits from a parallel U one shape.
Materials and Methods: In this study is presented the conversion of a vase canopy into a parallel U one, in an almond orchard at RSFG Constanta. The conversion was performed in 2021 and 2022 in vegetative seasons, to Veronica, Mirela, Tuono and Supernova varieties. To make the conversion of the open vase into a parallel U, we made manual pruning. The paper presents the amount of wood fell during cutting and the benefits of this conversion. This study is useful for fruit growers who want to have an easier management of their orchard.
Results: During the pruning in 2021 where the trees had the initial Open Vase canopy, the amount of wood fell during the pruning was higher, compared to the second pruning, where we adopted the Parallel U canopy. The canopy of the Parallel U simplified the technology and facilitated the increase of productive elements.
Conclusion: The varieties Supernova and Mirela proved to be more vigorous than Veronica and Tuono.

Keywords: almond culture, canopy, conversion, u parallel

BREEDING A NEW APPLE HYBRID POPULATION WITH THE *VF* GENE THROUGH MARKER-ASSISTED SELECTION

Georgeta Maria BIVOLARIU (GUZU)[1,2], Ioan ZAGRAI[1], Claudiu MOLDOVAN[1], Luminița Antonela ZAGRAI[1], Anca Maria CHIOREAN[1] and Mirela Irina CORDEA[2]*

[1] *Fruit Research & Development Station Bistrița, Romania*
[2] *Faculty of Horticulture and Bussines in Rural Development, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania*
*Corresponding author, e-mail: mcordea@usamvcluj.ro

Introduction: The apple scab, caused by *Venturia inaequalis,* is recognized as one of the most devastating diseases of apples because it drastically affects leaves, fruits and other aerial parts of the susceptible cultivars. Consequently, apple breeding programs frequently aim to develop cultivars exhibiting resistance to scab. This is also the case of a breeding program initiated at FRDS Bistrița, to obtain progenies that inherit the *Vf* resistance gene to scab, accompanied by superior fruit qualities and a later harvest period. Currently, Marker-Assisted Selection (MAS) assay is usually used as a better alternative or complementary approach to the classical selection for early-stage identification of progenies carrying the *Vf* gene, particularly at the seedling stage.
Aims: The primary objective of this study is to generate apple progenies through a hybrid combination and to utilize MAS to identify the presence or absence of the *Vf* gene.
Materials and Methods: The experiment was conducted at Fruit Research and Development Station (FRDS) Bistrița, where controlled pollinations were performed on apple trees. In this experience was used as a female genitor cultivar Salva (a valuable local genotype in terms of fruit, donor for *Vf* gene) and a male genitor Jonathan (cultivated on a large scale both in Romania and worldwide). Seeds obtained from these crosses were germinated to produce seedlings, which were then assessed for their success rate. To quickly identify the *Vf* gene in an early development stage of progenies, three pairs of SSR primers were used: one dominant (AM19) and two codominants (AL07 and VFC), which allow the differentiation between homozygous and heterozygous genotypes.
Results: From approximately 87 seeds produced by the hybrid combination Salva × Jonathan, 79 seedlings (90.8%) were suitable for transplanting into individual pots. The heterozygous *Vfvf* genotype was observed in 24 hybrids out of the 67 tested. Therefore, the *Vf* gene was transmitted from the maternal parent to 35.8% of the tested hybrids. The remaining hybrids (43) did not inherit the dominant gene, thus presenting a homozygous recessive genotype (*vfvf*).
Conclusions: The results of this study have led to the establishment of a hybrid field comprising the hybrid plants, which are currently undergoing the selection process for other traits.

Keywords: MAS, molecular markers, monogenic resistance, *Venturia inaequalis*

THE EFFECT OF NITROGEN FERTILIZATION ON QUALITY INDICES OF RASPBERRY YIELD IN RELATION TO HIGH TEMPERATURES

Diana Elena BOLOHAN, Ioana BUȚERCHI and Lucian RĂUS*

Faculty of Agriculture, Iași University of Life Sciences
*Corresponding author, e-mail: lucian.raus@iuls.ro

Introduction: Raspberry (*R. idaeus* L.) fruits are highly appreciated by consumers due to the taste, but also for the benefits it has on human health. In recent years, in Romania, the areas cultivated with raspberries have increased due to market demand, but also due to the profitability of the crop. Raspberry fruit is rich in vitamins and fiber, which attracts consumers looking for healthy living ((Lopez-Corona *et al*., 2022).
Aims: In this study, were monitored the effects of the nitrogen fertilizers, in different doses, on the quality of the fruits. The results were set in correlation with the high temperatures of the harvest period.
Materials and Methods: The mineral fertilizer, ammonium nitrate, was chosen according to the soil analysis and had been used in three doses: 30, 60 and 90 kg/ha N active substance. A number of 5 samples were extracted from the harvested fruits, Heritage and Rosalinda variety, and subjected to laboratory analysis in order to determine: soluble dry matter, titratable acidity, total dry matter, average fruit weight.
Results: The application of high doses of fertilizer led to an increase in raspberry production, bigger fruits, but lower dry matter 11.6%. The highest dry matter content was obtained in the case of the unfertilized variant, scoring 14.97%. Titratable acidity was not influenced by the application of fertilizers, but there was a decrease, which might be due to the high temperatures during the harvest period.
Conclusion: The application of nitrogen fertilizers led to higher yields. The high temperatures during harvest period have substantially changed the fruit quality indices.

Keywords: ammonium nitrate, dry matter content, high temperatures, quality production

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THE RESPONSE OF SOME SWEET CHERRY CULTIVARS TO THE ATTACK OF MINING LARVAE AND MOTHS IN THE ECOLOGICAL CONDITIONS OF NORTHWEST ROMANIA

Daniel CALANCEA[1], Cătălina DAN[1], Adriana F. SESTRAS[1]*, Mădălina MILITARU[2] and Radu E. SESTRAS[1]

[1] *University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca, Romania*
[2] *Research Institute for Fruit Growing ICDP Pitesti-Maracineni, Romania*
*Corresponding author, e-mail: adriana.sestras@usamvcluj.ro

Introduction: The sweet cherry (*Prunus avium* L.) is a fruit tree whose fruits are particularly appreciated by consumers. The cherry meets favourable conditions in the northwest of Romania, but production and fruit quality can be strongly influenced by ecological conditions and the abiotic and biotic stressors (Sestras, 2004). Among the biotic stressors, apart from pathogens, harmful insects can cause quantitative and qualitative declines (González-Núñez *et al*., 2022).
Materials and Methods: Monitoring cherry orchards near Cluj-Napoca, in northwest Romania, revealed an increase in leaf miners and moths. The insect incidence was determined by assessing the leaves impacted by the larvae of the main identified species throughout two consecutive years, on ten varieties of sweet cherry.
Results: The most frequent mining insects were the pear leaf blister moth - PLBM (*Leucoptera malifoliella*), the spotted tentiform leaf miner - STLM (*Phyllonorycter blancardella*), and the summer fruit tortrix - SFT (*Adoxophyes orana*). STLM has not been detected so far in the orchard where the observations were made. It seems that the warm weaather favoured the invasion of insects or the continuity of PLBM from the previous years when it appeared suddenly (with a severe attack of 60% of the foliage) in both apple and cherry orchards. Most leaves affected by PLBM were in the middle part of the tree crown, with up to 10% of leaves with larvae, especially in Katalin and Carmen, and less in Regina genotype. The incidence of STLM larvae was both in the middle and lower part of the crown of the trees, with a frequency of up to 30%, Kordia and Lapins being more susceptible. SFT attacks predominated in the upper part of the trees, at about 5% of the leaves, with a higher incidence in Karina. The best reaction to pest assault was reported in the varieties Burlat, Sylvia and Karina.
Conclusion: Understanding how cultivars respond to pest infestations and monitoring insects in the orchard are key prerequisites for ensuring superior and high-quality fruit output. Promotion of pest-resistant or tolerant cultivars, along with proper phytosanitary treatments, can assure the success of cherry crops in the investigated area.

Keywords: fruit, leaves, pest attack, phytosanitary treatments, yield

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THE EFFECTS OF CLIMATE CHANGES ON THE PHENOLOGY OF SOME CHOKEBERRY (*ARONIA MELANOCARPA*) CULTIVARS

Anca Maria CHIOREAN[1,2], Zsolt JAKAB- ILYEFALVI[1], Smaranda ROȘU- MAREȘ[1], Georgeta GUZU[1], Claudiu MOLDOVAN[1], Ioan ZAGRAI[1] and Mirela Irina CORDEA[2]*

[1] *Fruit Research & Development Station Bistrița, Romania*
[2] *Faculty of Horticulture and Bussines in Rural Development, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania*
*Corresponding author email: mcordea@usamvcluj.ro

Introduction: In recent years, global climate change has led to extreme drought and severe weather like hail, heavy rainfall, floods, frost and storms, prompting researchers, breeders and producers to develop and grow new plant varieties that can thrive in changing climate and soil conditions. The adverse effects of climate change have a significant impact on the yield and quality of the fruits. There is a specific emphasis on cultivating berry fruits that are drought resistant. Chokeberry (*Aronia melanocarpa* (Michx.) Elliot) is a deciduous shrub renowned for its adaptability to various soil and climate conditions, as well as for its resistance to both drought and humidity.
Aims: This research aimed to reveal the impact of climate change on the phenology of four chokeberry cultivars over the study years, 2023 and 2024, in Bistrita, Northern Transylvania.
Materials and Methods: The biological material was represented by four chokeberry cultivars, 'Nero', 'Melrom', 'Galicjanka' and 'Viking' from the experimental plot located at Fruit Research and Development Station Bistrita (FRDS Bistrița) in Northern Transylvania. For phenological descriptions it has been used the Biologische Bundesantalt, Bundessortenamt and Chemische Industrie (BBCH) scale, correlated with the data from the FRDS Bistrita weather station.
Results: Observations revealed that there were variations between the two study years (2023-2024) in terms of the dormancy, flowering and fruiting periods. Therefore, due to warmer weather in the 2024 year, the main phenophases occurred one month earlier compared to 2023. Inflorescence buds swelling (BBCH 51) was observed between 01 February and 12 February 2024, whereas it occurred between 1 March and 10 March in 2023. Full flowering (BBCH 65) happened between 12 April and 15 April in 2024, compared to 10 May and 13 May in 2023. Fruits reaching 90% of their final size were observed between 30 June and 08 July in 2024, while in 2023, this stage occurred between 08 July and 31 July. However, there were no significant differences in the phenology between cultivars, in the same year, as they all went through these stages at similar times.
Conclusion: The study's results indicate that chokeberry cultivars phenology timing is highly reliant on climatic conditions and adaptable to different growing areas.

Keywords: BBCH scale, climate, rising temperatures, vegetation stages

CHARACTERIZATION OF GRAPEVINE GENOTYPES BY SIMPLE SEQUENCE REPEATS (SSR) MARKERS AND DEVELOPMENT OF A MICROSATELITE DNA-BASED BARCODES DESIGN

Monica HÂRŢA[1], Rodica POP[1], Liliana ROTARU[2], Alin Ionel DOBREI[3], Doina CLAPA[1]*

[1] Faculty of Horticulture and Business in Rural Development, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania
[2] Faculty of Horticulture, 'Ion Ionescu de la Brad' Iaşi University Life Sciences, Romania
[3]Faculty of Engineering and Applied Technologies, University of Life Sciences "King Mihai I of Romania" Timişoara, Romania
*Corresponding author, e-mail: doina.clapa@usamvcluj.ro

Introduction: Romania is a country with a valuable viticultural heritage. Thus, genetic evaluation of grapevine genotypes from national *Vitis* germplasm collections is very important.
Aims: In the present study, nine SSR loci were used to characterize 22 grapevine genotypes, including five international reference varieties. The genetic SSR profiles were used to construct a barcode design, in order to compare the number and allele sizes between the grapevine samples analysed.
Materials and Methods: Total genomic DNA isolation and PCR amplifications were performed following the protocols described previously by Hârța and Pamfil (2013). Allele sizes/locus were determined using the CEQ fragment analysis software. Genetic parameters (allele frequencies, expected and observed heterozygosity, estimated frequency of null alleles and probable identity) were calculated using Identity 1.0 software. DNA barcodes were constructed using Microsoft Excel tool.
Results: A total of 97 SSR alleles were amplified with nine SSR primer pairs, with an average number of 10.77 alleles/locus, revealing a high level of polymorphism. The cumulative probability of identity was also high (7.403 × 10−13). The values of He were in agreement with those recorded for probability of identity (PI) for all analysed SSR loci. VVMD28 was the most informative (He = 0.991; PI = 0.014) SSR marker, with 19 alleles generated. Conversely, VvZag62 locus generated the lowest number of alleles (6) with recorded values for He = 0.748 and PI = 0.105. DNA microsatellite analysis was used to construct a barcode design. The results of this study showed that this system of data grouping was useful for characterisation of the investigated Romanian grapevine genotypes.
Conclusion: A valuable SSR genotyping supplemented with a useful way of grouping data can be effective for genetic diversity analysis of *Vitis* germplasm resources.

Keywords: genetic resources, microsatellites, molecular analysis, polymorphism, *Vitis* × *vinifera*

EFFICACY OF SOME BIOLOGICAL AND CONVENTIONAL PRODUCTS IN FIRE BLIGHT MANAGEMENT IN *MALUS DOMESTICA* BORKH

Smaranda Doina ROŞU-MAREŞ[1*], Ioan ZAGRAI[1], Claudiu MOLDOVAN[1], Anca Maria CHIOREAN[1,2], Georgeta GUZU[1,2] and Zsolt JAKAB- ILYEFALVI[1]

[1] *Fruit Research & Development Station Bistrita, Romania*
[2] *University of Agricultural Sciences and Veterinary Medicine Cluj Napoca, Romania*
[*]Corresponding author, e-mail: smaranda.boila@usamvcluj.ro

Introduction: *Erwinia amylovora* Burrill., the causal agent of fire blight, is one of the most devastating diseases affecting fruit trees in the Rosaceae family, particularly apple (*Malus domestica*). Effective control of this bacterium is essential to protect both yield and fruit quality. Copper-based products are often used due to their bactericidal action, but alternative biological and chemical products are also being explored to diversify management strategies.
Aims: The aim of this study was to evaluate the efficacy of various substances in controlling fire blight, applied to the Jonathan apple cultivar, which is known for its susceptibility to the disease.
Materials and Methods: The experiment was conducted in 2021 in an apple orchard planted with the Jonathan cultivar. Five experimental treatment variants were tested alongside an untreated control variant. The substances included in the study were copper hydroxide, copper oxychloride, *Bacillus subtilis* strain QST 713, fluopyram + fosetyl-aluminum, and prohexadione calcium. Applications were made according to the producer recommendations for fire blight control, and the efficacy of each substance was evaluated based on the reduction in disease incidence compared to the untreated control. The data analysis was performed on Microsoft Office with Excel tools, using One-way Anova test, followed by the Duncan`s multiple range test and the Least Significant Difference Test.
Results: The results indicated that copper-based products (copper hydroxide and copper oxychloride) were the most effective in reducing the incidence of *E. amylovora* infections. These treatments demonstrated superior efficacy compared to alternative treatments, providing significant protection against fire blight.
Conclusion: Under the experimental conditions of 2021, copper hydroxide and copper oxychloride showed significantly higher efficacy than the other tested biological and chemical alternatives, underscoring the importance of these products in integrated crop protection strategies.

Keywords: *Bacillus subtilis*, bacterial disease, copper hydroxide, copper oxychloride, *Erwinia amylovora*, fluopyram, fosetyl-aluminum, prohexadione calcium

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ASSESSMENT OF GENETIC STABILITY AMONG MICRO PROPAGATED *PRUNUS DULCIS* PLANTLETS USING SCOT MARKERS IN DUHOK PROVINCE KURDISTAN REGION, IRAQ

Diana SALEH[1], Jaladet JUBRAEL[2]* and Mosleh SALEH DUHOKY[3]

[1] *Biology department, College of Science, University of Duhok, Iraq*
[2] *Scientific Research Center, College of Science, University of Duhok, Iraq*
[3] *Horticulture department, College of Agricultural Engineering Sciences, University of Duhok, Iraq*
*Corresponding author, e-mail: jaladet.jubrael@uod.ac

Introduction: Almond [*Prunus dulcis* (Miller) D.A. Webb] tree is a species in the subgenus Amygdalus belonging to genus *Prunus*, Rosaceae family. Plant tissue culture techniques are commonly used when there is a need for large numbers of high-quality plant material from a specific genotype, as traditional methods of cultivation and natural propagation are unable to fulfill the necessary needs. The long-term viability of the regeneration systems relies on preserving the genetic integrity of micro propagules. However, occurrence of tissue culture induced variations at any stage of plantlets' development is one of the major problems associated with micropropagation among donor plant and its clones. To analyse genetic stability in micropropagated plants, molecular markers present powerful and valuable tools. SCoT markers have been extensively used to assess and detect DNA modifications. They are simple, novel DNA markers based on the short-conserved region flanking the ATG translation start codon in plant genes, which were developed by Collard and Mackill (2009).
Aims: The purpose of the current study was the use of SCoT polymorphic markers to assess genetic fidelity of *in vitro* regenerated plantlets integrity.
Materials and Methods: The plantlets were produced by multiplication of the axillary buds and from callus regeneration. In these experiments, eight different almond genotypes collected from different parts in Duhok Province KGR- Iraq as mother plants were used. DNA was extracted and 16 micropropagated plantlets were produced following at least one year of culturing and subculturing. All DNA samples were subjected to molecular analysis, using 15 primer sets of SCoT PCR markers.
Results: A high degree of polymorphism was detected among the plantlets obtained both from the buds and from the indirect callus regeneration, revealing a vast array of genetic changes compared to the mother plants. The results of DNA banding patterns between the eight almond mother plants produced a total of 181 reproducible and scorable bands, out of which 169 bands were polymorphic, leading to a rate of polymorphism ranging 72.7 to 100 %. The UPGMA Cluster analysis based on SCoT marker systems categorized the 8 almond genotypes into two main groups. The first group was subdivided into three subgroups clustering seven genotypes, whereas the second group included one genotype.
Conclusion: The results of this study found that SCoT markers are reliable for genetic stability analysis and may suggest their application in the commercial micropropagation production for detection of true-to-type plantlets to mother plants.

Keywords: genetic stability, micropropagation, *Prunus dulcis*, start codon targeted (SCoT)

BUCKWHEAT (*FAGOPYRUM ESCULENTUM* L.) CULTIVATION UNDER DROUGHT STRESS

Panteleimon STAVROPOULOS, Aikaterini SARSENTOU, Konstantinos PANTALEON, Sotiria PATSIALI, Antonios MAVROEIDIS, Ioannis ROUSSIS and Ioanna KAKABOUKI*

Faculty of Crop Science, Agricultural University of Athens, Greece
*Corresponding author, e-mail: i.kakabouki@aua.gr

Introduction: *Fagopyrum esculentum* is one of the 30 species of Polygonaceae with high economic importance. It is mainly cultivated for its seeds, which have high nutritional value (Rodriguez *et al*., 2020). Buckwheat shows tolerance to drought stress (Martínez-Goni *et al*., 2024).
Aims: The aim of this study was to evaluate the effect of different types of N - fertilizers on growth and yield of buckwheat, under drought stress.
Materials and Methods: A field experiment was set up at the field of Agricultural University of Athens. The area had 250 m^2. The experimental design was split–splot, with 2 factors and 3 replicates. The first factor was the N–fertilization: one was Urea (U) (46–0–0) and the second was Urea with Urease inhibitor (UI) (46–0–0 + urease inhibitors). The amount of fertilizer added was 65 kg ha^{-1}. The second factor was the irrigation. For the full irrigation (X) 250 mm of water were used, while 180 mm for the reduced (Z). Cv. Novosadska seeds were sowed on the 28th of April 2024. Right before sowing, fertilizers were put in the field and integrated with plough and drip irrigation system was set up. The harvest took place on 30th of August by hand (duration 92 DAS). During the experiment, plants were measured every 15 days. The measurements were about plants height, fresh and dry weight, number of leaves, number of branches, number of inflorescences, seeds per plant, Thousand Seeds Weight (TSW) and yield.
Results: According to the results, buckwheat was mainly influenced by fertilization. All the agronomic traits were statistically significant higher on treatments with N – fertilization. Yield increased, with the use of fertilization. Drought did not significantly affect crop's yield and TSW, while it influenced plant's height and weight.
Conclusion: In the present study, we demonstrated that buckwheat can be used as an alternative to summer - season crops. The tolerance to drought stress and the insignificant influence on crop's yield can lead to an agricultural system that saves more water.

Keywords: buckwheat, drought stress, *Fagopyrum esculentum*, inhibitors, N – fertilization

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INTERNATIONAL COLLABORATION AND MULTILINGUALISM IN AGRICULTURAL SCIENCE – A SCHOLARLY JOURNAL EXAMPLE

Zvonimir PRPIĆ[1*], Lyubka KOLEVA-VALKOVA[2], Luboš ZÁBRANSKÝ[3], Károly DUBLECZ[4], Magdalena STANEK[5], Mirela Irina CORDEA[6], Snežana TANASKOVIĆ[7], Branislav GÁLIK[8], Jože VERBIČ[9], Andreja ŽIBRAT GAŠPARIČ[9], Nikolina KELAVA UGARKOVIĆ[1] and Nikola KEZIĆ[1]

[1] *University of Zagreb Faculty of Agriculture, Zagreb, Croatia*
[2] *Agricultural University Plovdiv, Plovdiv, Bulgaria*
[3] *University of South Bohemia, Faculty of Agriculture and Technology, České Budějovice, Czech Republic*
[4] *Hungarian University of Agriculture and Life Sciences, Keszthely, Hungary*
[5] *Bydgoszcz University of Science and Technology, Bydgoszcz, Poland*
[6] *University of Agricultural Sciences and Veterinary Medicine, Cluj - Napoca, Romania*
[7] *University of Kragujevac, Faculty of Agronomy Čačak, Čačak, Serbia*
[8] *Slovak University of Agriculture in Nitra, Faculty of Agrobiology and Food Resources, Nitra, Slovakia*
[9] *Agricultural Institute of Slovenia, Ljubljana, Slovenia*
[*]Corresponding author, e-mail: zprpic@agr.hr

Introduction: The social changes that took place in Central Europe at the end of the last century led to major changes in agriculture. The beginning of the new millennium and the spread of new electronic technologies created new fields in research publishing and facilitated access to knowledge from remote places. In addition, there is a need to share problems and solutions with neighbouring countries, but it is also important to preserve and develop national languages and identities.
Material and methods: The *Journal of Central European Agriculture* (JCEA) was founded in 1999 by three universities from Croatia, Hungary and Slovakia. In addition to sharing problems and solutions in the region, the idea behind the JCEA was to preserve and develop national languages in agriculture as a profession, as a part of soft skills competencies.
Results: The Editorial Board has grown over the years and now includes 9 member countries, i.e. universities and institutes from Central European, countries with a similar socio-economic history. To avoid the obsolescence of agricultural vocabulary and to keep the native languages alive, authors from member countries can publish in their national language or English. Each member country organises a National Editorial Board, which is responsible for reviewing articles in its national language and the organisation of peer review of other papers. Due to the similarity of the languages of some member countries, articles written in one of the national languages can also be reviewed internationally.
Conclusion: The Editorial Board, which is made up of representatives from all 9 institutions, enables JCEA to have a broad base of reviewers. The multilingual strategy reflects the global intention to preserve and promote the use of national languages in sciences. The inclusion of JCEA in bibliographic databases (WoS, Scopus, etc.) gives authors international visibility and the opportunity to further disseminate their research results.

Keywords: agriculture, Central Europe, multilingualism, digital publishing

SESSION 5: ECONOMICS AND RURAL DEVELOPMENT

PARTICIPATORY APPROACHES FOR SUSTAINABLE LIVESTOCK PRODUCTION

Agnes VAN DEN POL-VAN DASSELAAR

Grassland and Grazing Group, Aeres University of Applied Sciences, the Netherlands
Corresponding author, e-mail: a.van.den.pol@aeres.nl

Introduction: Livestock systems are essential for meeting global demand for animal products but are criticised for their negative impacts. Future systems should capture the positive effects and minimize negative effects. Participatory approaches, which give affected parties a voice, can help align systems with local needs and improve sustainability.
Aims: This study explores the characteristics and benefits of participatory approaches used to enhance the sustainability of livestock production.
Materials and Methods: The study utilises examples from EU-funded projects PATHWAYS (www.pathways-project.com; GA 101000395) and Grazing4AgroEcology (G4AE; www.grazing4agroecology.eu, GA101059626), employing quantitative (surveys) and qualitative research methods (focus groups, farm networks and Living Labs).
Results: Surveys were used to explore the opinions of relevant stakeholders (e.g. Ankersmit *et al*., 2024; Van den Pol-van Dasselaar *et al*., 2024). They were preceded by stakeholder analyses to identify those that are involved in or affected by decisions. Focus groups were used to gather in-depth data from actors in the Agricultural Knowledge and Innovation System (e.g. in G4AE where relevant aspects to modernise the sector were identified and prioritised). Farm networks were established to facilitate the exchange of information around a certain theme of innovation (e.g. 8 Partner Farm Networks in G4AE and 15 Practice Hubs in PATHWAYS focusing on innovative practices related to sustainable livestock production). Connected to the Practice Hubs in PATHWAYS, 15 Living Labs were established to test practical improvements in on- or off-farm farmer-initiated trials.
Conclusion: Participatory approaches enhance collaboration, ownership and decision-making in livestock production. By integrating diverse perspectives, these methods contribute to more sustainable systems that better meet stakeholder needs and capabilities.

Keywords: farm networks, focus groups, living labs, participatory approaches, surveys

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THE IMPACT OF THE DEVELOPMENT OF NON-AGRICULTURAL ACTIVITIES ON THE SUSTAINABLE DEVELOPMENT OF THE ROMANIAN RURAL SPACE

Tabita ADAMOV, Tiberiu IANCU*, Gabriela POPESCU, Ramona CIOLAC, Dragoș CHENDE and Marius GORDAN

Faculty of Management and Rural Tourism, University of Life Sciences "King Mihai I" from Timișoara, Romania
*Corresponding author, e-mail: tiberiuiancu@usvt.ro

Introduction: Entrepreneurship is considered the engine of the economic and social growth of society, for which the development of this sector, in the rural area, represents a major opportunity in the sustainable development of rural areas. The issue of sustainable rural development has in mind a complex approach to rural space, focusing on the entire potential of these areas, not just the agricultural one. Rural entrepreneurship is therefore an essential factor in the economic development of communities.
Aims: The purpose of this paper was to analyse the implications that non-agricultural entrepreneurship generates on the development of Romanian villages and on the quality of life of the inhabitants of these areas.
Materials and Methods: For fulfilment of the proposed objectives, was used the quantitative method of data collection, based questionnaire. The information processing was done through computer programs (Excel, Paint, hi-square test R).
Results: The development of businesses in rural areas increases the income of the inhabitants of rural communities and implicitly increases the standard of living. It is known that, SMEs play an important role in achieving the GDP and generating new jobs for a significant part of the active population.
Conclusion: Currently, Romanian rural entrepreneurship unfortunately faces numerous vulnerabilities. There is a need to support and encourage rural entrepreneurs in identifying financial resources, to support access to these resources and, finally, to provide them with consultancy in business initiation and development. Thus, the development of SMEs in rural areas is an important economic factor with an impact on Romanian rural communities.

Keywords: entrepreneurship, rural space, sustainable development

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ECOMUSEUM OF ȚARA MOȚILOR. A SUSTAINED EFFORT TO SAFEGUARD THE SURROUNDING LANDSCAPE AND FOSTER RURAL DEVELOPMENT WITHIN THE APUSENI NATURAL PARK

Felix H. ARION[1], Alin MOS[2]*, Oana BRINZAN[3] and Iulia Diana ARION[1]

[1] University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania
[2] Apuseni Nature Park Administration
[3] "Aurel Vlaicu" University of Arad
*Corresponding author, e-mail: alinmos@parcapuseni.ro

Introduction: Ecomuseums are community-driven initiatives designed to preserve and interpret local, cultural and natural heritage within its original context. Unlike traditional museums, ecomuseums cover entire landscapes and communities, highlighting the interaction between people and their environment.
Aims: This study explores the historical and cultural background of Țara Moților (Moți Land), focusing on its distinctive karst landscapes, biodiversity and traditional practices.
Materials and Methods: It addresses the challenges faced by rural communities, such as depopulation and cultural identity loss, proposing ecomuseums as a viable solution for sustainable development and heritage preservation.
Results: By examining eco-museology principles and comparing them to the management strategies of protected areas, particularly those under the Category V IUCN management category for protected landscapes, the study underscores the significance of community involvement, sustainable resource use, and the integration of cultural and natural heritage in both approaches.
Conclusion: The establishment process of the Țara Moților ecomuseum is detailed, highlighting the collaboration between local authorities, the Apuseni Natural Park Administration and community stakeholders. Thus, ecomuseums have the potential to serve as effective tools for sustainable rural development and heritage conservation.

Keywords: Apuseni Mountains, conservation, ecomuseum, rural communities

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"TURN AROUND, DON'T DROWN" - LESSONS LEARNT FROM THE 2023 FLOOD IN MAGNESIA, GREECE

Efthimios BAKOGIANNIS[1], Konstantina-Despoina ATHANASIA[2], Anna DIONYSOPOULOU[2], Gabriela PLAKA[2], Vasilleios SIDIRAS[2], Maria XIROGIANNIS[2] and Charalampos KYRIAKIDIS[1]*

[1] Department of Geography and Regional Development, School of Rural, Surveying and Geoinformatics Engineering, National Technical University of Athens, Greece
[2] Postgraduate Programme "Environment & Development" (c.M.Sc.), National Technical University of Athens, Greece
[3] School of Architectural Engineering, National Technical University of Athens, Greece
*Corresponding author, e-mail: kyriakidisharry@gmail.com

Introduction: In recent years, climate change has become more and more noticeable as weather conditions are hazardous to human life and settlements. As a result, cities and their municipal authorities need to deal with the various risks related to natural disasters that are enhanced by the pressure of urbanization. The European Union (EU) and the United Nations (UN) are leading the states to such a resilience-oriented planning policy focusing on promoting environmental, social, economic and technological sustainability, in terms of preventing disastrous effects and limiting/restoring the damages during post-crisis period.
Aims: In this context, the study focuses on floodings, which are one type of environmental crisis that affects local economy and society. The regional unit of Magnesia has been selected as a case study as its northern part has been vastly affected by a flood during 2023 and a series of socio-technical problems have emerged. Based on this case study, we focused to identify the causes that have led to such a crisis, iso that an action plan to be formulated to (a) improve the resilience level of the area and (b) draw conclusions in developing ideal strategies that eliminate the effects of flooding phenomena.
Materials and Methods: To gain the aforementioned goals, a comprehensive analysis of the study area has been implemented; more specific, geomorphology, residential networks and urban form of settlements, technical and social infrastructure, as well as environmental characteristics have been examined. Following an assessment process, based on the SWOT analysis method, an action plan has been proposed.
Results: Problems were identified, classified and assessed based on various sectors. In that way, it was realized that sectors, like technical infrastructure and residential buildings, were mainly damaged; at the same time, urban planning sector was identified as one of the most important sectors that determines the manner in which similar phenomena are to be managed.
Conclusion: Conclusions came to the fore underline that, except of the extent of the precipitation, the absence of planning played a role in occurrence of disasters of such magnitude. Directions for spatial planning process and the role of specific planning tools, like the Special Urban Plans (SPP) are also explained. This conclusion is important, as the legal framework of spatial planning has been renewed and SPPs for various municipalities are under implementation.

Keywords: climate crisis, flooding risk, Magnesia, SWOT analysis, urban resilience

A REVIEW OF THE LITERATURE REGARDING THE FOOD SYSTEM APPROACH IN EUROPE

Raluca BARBU and Diana DUMITRAȘ*

Department of Economic Sciences, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania
*Corresponding author, e-mail: ddumitras@usamvcluj.ro

Introduction: The increasing significance of the food system approach is pivotal in addressing the complexities of food production and distribution, particularly in Romania, where agriculture significantly influences the economy and culture. Small producers face challenges such as limited market access and resource availability. This paper reviews the literature on the food system approach, highlighting its potential to enhance the system's sustainability. Drawing on the works of Ericksen (2008) and FAO (2020), the paper explores how implementing a food system approach can connect various actors to overcome system gaps and address the challenges faced by small producers in accessing the market.
Aims: To do a brief review of the research literature, to investigate the implementation of a food system approach as an essential tool for creating a more resilient and sustainable food system in Romania, focusing on supporting small producers.
Materials and Methods: The analysis was done based on grey literature and scientific articles.
Results: The main actors and the key themes of the food system and small producers were identified. The study identifies key food system actors and examines the influence of collaborative partnerships, as emphasized in the Food2030 strategy (European Commission, 2021), which is critical for achieving inclusive growth and building a resilient agricultural framework for Romania's future. The findings emphasize the importance of adopting a food system approach to enhance Romania's food system resilience and sustainability by supporting small producers.
Conclusion: Recognizing the interconnected food processes crucial for security and sustainability is vital. Aligning with European directives like the Food2030 strategy requires fostering partnerships and implementing systemic changes through well-funded research and inclusive strategies. These efforts are crucial to overcoming challenges faced by small producers and building a more inclusive and robust agricultural framework in Romania.

Keywords: food system, food system governance, small producers

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DISTINCTIVE ECONOMIC CHARACTERISTICS OF MOUNTAIN REGIONS AND COMPREHENSIVE STRATEGIES FOR SUSTAINABLE DIVERSIFICATION

Rebeca Claudia CHIRILĂ[1]*, Ramona Vasilica BACTER [2] and Iulia Cristina MUREȘAN[1]

[1] *Faculty of Horticulture and Business in Rural Development, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania*
[2] *Faculty of Environmental Protection, University of Oradea, Oradea, Romania*
*Corresponding author, e-mail: rebeca-claudia.chirila@student.usamvcluj.ro

Introduction: Mountain regions are marked by unique economic traits that present both challenges and opportunities for sustainable diversification (Thorn et al., 2021). Geographic isolation, limited infrastructure, and environmental vulnerabilities constrain development and create dependence on a narrow range of industries, particularly agriculture and tourism. This makes these regions especially vulnerable to economic volatility and environmental degradation.
Aims: This study explores the economic characteristics of mountain areas and proposes strategies for sustainable diversification to enhance financial resilience and reduce sectoral dependency.
Materials and Methods: A mixed-methods approach combined quantitative analysis of industry composition, employment, income, and environmental indicators with qualitative case studies. These methods identified economic vulnerabilities and successful diversification strategies in various mountain regions.
Results: While many mountain regions rely heavily on agriculture and tourism (Lun et al., 2016), their diversification potential varies based on factors like proximity to urban centers, resource availability, and infrastructure development (Jodha et al., 1992). Regions with better market access and infrastructure successfully integrated higher-value activities such as agro-processing and niche tourism.
Conclusion: Tailored strategies are necessary to address the specific economic, social, and environmental contexts of mountain regions. Recommendations include fostering public-private partnerships, infrastructure investment, improving education and vocational training, and promoting innovation in sustainable sectors.

Keywords: economic diversification, geographic isolation, rural infrastructure, sustainable development

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FROM EAST TO WEST: INTERNATIONAL TRADE AND TRANSFORMATIONS IN MOLDOVA'S AGRICULTURAL SECTOR

Liliana CIMPOIES[1]* and Adrian COJOCARU[2]

[1] *Faculty of International Economic Relations, Academy of Economic Studies of Moldova, Moldova*
[2] *Doctoral School, Academy of Economic Studies of Moldova, Moldova*
*Corresponding author, e-mail: lcimpoies@ase.md

Introduction: Moldova's economy has historically relied on its agricultural sector, with a large part of its population engaged in farming. In recent decades, this sector has undergone significant changes due to international trade dynamics, technological advancements and policy reforms. Globalization has increased agricultural trade, requiring structural adjustments. Trade liberalization has opened new markets, especially with the EU. Over the years, Moldova's agricultural exports have diversified, with notable increases in the export of fruits, vegetables and wines. However, the agricultural sector still faces challenges in accessing technology and capital, affecting the competitiveness in international markets.
Aims: The aim of this research was to provide a comprehensive understanding of the current trends and transformations in Moldova's agricultural sector, by assessing shifts in production patterns, export-import dynamics, and studying the impact of global market integration through the lens of international trade in agri-food products.
Materials and Methods: To evaluate the current situation and transformations in international trade of agri-food products, various trade indicators were utilized. This analysis encompasses changes in the structure of key traded commodities, geographical distribution, competitiveness, and other trade flow patterns. Different trade indicators were employed to assess the levels of intra-industry and inter-industry trade (RTA index, GL index). The period analyzed includes data from 2001 to 2022.
Results: The overall RTA index suggests that Moldova's agricultural sector is better positioned in the EU market than in the CIS market, reflecting successful integration driven by favourable trade agreements and regulatory alignment. The comparative advantage with EU countries has shown robust growth, particularly in vegetable products and prepared foodstuffs. Conversely, the RTA index with CIS countries presents a mixed trend, due to political and economic instability. The GL index indicates high intra-industry trade in sugar, foodstuffs, beverages, cereals and dairy products, with opportunities for policy interventions to enhance trade in less balanced categories like vegetable fats and oils.
Conclusion: To sustain and improve comparative advantage, Moldova could focus on enhancing production capabilities, improving quality standards, diversifying markets and adapting to global market trends.

Keywords: agri-food products, agricultural sector, competitiveness, inter-industry-trade, intra-industry-trade

TRANSFĂGĂRĂȘAN: FROM STRATEGIC MILITARY ROAD, FACILITATOR OF TOURISM DEVELOPMENT IN FĂGĂRAȘ MOUNTAINS

Vasile Mihai CUCERZAN

Faculty of Horticulture and Business in Rural Development, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania
Corresponding author, e-mail: cvmihai@yahoo.com

Introduction: The Făgăraș Mountains are among Romania's most important natural tourist attractions, and one of the most famous roads to cross them was built in the period 1970-1974, bearing the name Transfăgărășan. It is an asphalted road with a length of 151 km, reaching near Lake Bâlea an altitude of 2042 m and it ranks second in altitude in the ranking of alpine roads in Romania.
Aims: The purpose of this paper was to analyse the impact that national road 7C (Transfăgărășan) has on the development of rural tourism in the Făgăraș Mountains area. The year 2024 marks 50 years since the construction of this important road infrastructure objective that connects Transylvania and Muntenia, two historical regions of Romania. Although the purpose of this important project was initially orientated for strategic military reasons, over time it became an internationally renowned tourist attraction.
Materials and Methods: The research methods used in the research were document analysis and the interview. The analysed documents (statistical, media, bibliographic resources) allowed highlighting the development of tourism in the region, and through the interview method it was found out the opinions of the respondents in relation to the socio-economic realities correlated to this infrastructure project. Also, based on the information obtained, a SWOT analysis was carried out.
Results: Despite the fact that it is accessible to tourists only five months a year, Transfăgărășan attracts a significant number of tourists, both through the prism of the fact that it represents an attractive objective itself, and also due to the fact that it facilitates the access to a mountain area with beautiful landscapes, with a special flora and fauna. Numerous tourist reception units (hotels, guesthouses, restaurants) have been built in the area, which present an attractive and diversified offer.
Conclusion: In the present research work, it was demonstrated that this element of infrastructure allowed the considerable development of local rural tourism, becoming for a time one of the most famous and attractive tourist destinations at the national level.

Keywords: mountain tourism, rural development, Transfăgărășan

ANALYSIS OF THE VALUE CHAIN OF ORGANIC GRAINS. A ROMANIAN CASE STUDY

Iulia Sorina DAN* and Ionel Mugurel JITEA

Faculty of Horticulture and Business for Rural Development, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania
*Corresponding author, e-mail: iulia-sorina.dan@student.usamvcluj.ro

Introduction: Organic grains represent an important agricultural sector in Romania, being the second large area cultivated in organic system (MADR, 2022). In the context of the European Green Deal targets, it is essential to understand the value-chain organisation of grains sector, in order to propose changes to boost its development.
Aims: The paper aims to carry out an analysis of the value chain of organic grains in Romania. The analysis was based on the mapping of the chain, highlighting the governance in the chain, but also identifying the barriers of the value chain, as well as certain levers to overcome them.
Materials and Methods: The hereby research was based on a qualitative study of representative stakeholders of the organic grains value chain in Romania. The semi-structured interview was used for the data collection process and the collected data were analysed using content analysis.
Results: The research shows that the value chain of organic grains in Romania is simple and short. The study identified the main barriers in the development of the system: low processing capacity; low demand for organic products and high legislative volatility. Key actors also suggested some levers to overcome the barriers, such as information and education campaigns for consumers about organic products and their benefits, processing within the country and avoiding the export of grains, as well as better targeted public policies.
Conclusion: The study highlighted the fact that the value chain of organic grains in Romania is relatively simple, but faces significant gaps in the processing capacity. This deficiency is the biggest barrier to the development of the grains value chain, preventing the maximization of added value and limiting the growth potential of the sector.

Keywords: barriers, mapping, organic grains, Romania, value chain

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PROFILING NATURE-BASED TOURISTS VISITING NATIONAL AND NATURAL PARKS OF ROMANIA: PRELIMINARY RESULTS

Delia DONICI and Diana DUMITRAȘ*

Faculty of Horticulture and Business in Rural Development, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania.
*Corresponding author, e-mail: ddumitras@usamvcluj.ro

Introduction: With its varied forms, nature-based tourism creates an opportunity to capitalise on the benefits provided by protected areas. Adding to the positive effects of direct contact with nature, national and natural parks shape the "playground" for numerous nature-based activities and learning circumstances that can enrich their visitors' lives (Buckley, 2020). Maintaining the balance between tourists' demands and environmental protection is challenging. Analysing tourists' attitudes towards parks is a useful tool in tackling this issue and improving interaction and cooperation.
Aims: Outlining the profile of nature-based tourists interested in visiting national and natural parks of Romania, limited to those who made at least one visit to a park between 2021 and 2023.
Materials and Methods: A questionnaire comprising a control question and 24 inquiries about tourists' visitation behaviour and preferences has been applied in two online versions since January 2024. A sample of 106 responses was collected and analysed in a brief report. A section of the survey focused on the motivation of past visits, and a scenario-based set of questions addressed the valuation of potential future visits.
Results: Camping, hiking and photography were identified as preferred activities, together with an interest in learning about wild medicinal plants. Getting close to nature is one of the highest importance motives for tourists choosing to visit a park. Among the most visited parks in Romania, Ceahlău and Bucegi were named. Satisfaction about existing facilities and the level of knowledge about visiting conditions vary among respondents, but with an expressed interest in learning more.
Conclusion: Together with the tourists, the service providers, local communities and park authorities can all benefit from understanding the everchanging trends and needs of tourists and their behaviour concerning protected areas such as national and natural parks.

Keywords: national park, nature-based tourism, nature tourist, sustainable development

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EXPLORING INNOVATIVE PASTURE MANAGEMENT AND CERTIFICATION POTENTIAL IN ROMANIA WITHIN A EUROPEAN FRAMEWORK

Vlad ISARIE* and Felix ARION

Faculty of Horticulture and Business in Rural Development, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania
*Corresponding author, e-mail: vladisarie97@gmail.com

Introduction: This study explores the interplay between traditional grazing practices and quality food certification in the European agri-food sector, emphasizing Romania's potential for a sustainable agriculture.
Aims: The research aims to prove the connection between traditional grazing practices and quality food certification in the Romanian agri-food sector.
Materials and Methods: Grazing, vital for ecological integrity and biodiversity, is examined alongside the significance of Geographical Indications (GIs) in endorsing grazing-based production for high-quality dairy and meat products.
Results: Focusing on Romania, the research highlights the untapped potential for certified grazing practices to enhance agricultural sustainability, economic competitiveness and access to premium markets.
Conclusion: It calls for aligning rural development with bioeconomic and economic principles and addresses the need for systematic research to support policy development for sustainable grazing certifications.

Keywords: agricultural technology, grazing management, quality product certification, rural development

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REVEALING THE CHANNELS OF INFORMATION TAILORED TO THE NEEDS OF ROMANIAN GRAZING FARMERS

Ionel Mugurel JITEA and Diana E. DUMITRAȘ*

Department of Economic Sciences, Faculty of Horticulture and Business for Rural Development, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania
*Corresponding author, e-mail: ddumitras@usamvcluj.ro

Introduction: Knowledge and innovations often fail reaching the potential user, being fragmented and not fully implemented by farmers and rural communities (Oost *et al*., 2020). This might be lessened by identifying and utilizing the most effective information channels tailored to farmers' needs, what works best for providing relevant and useful knowledge. A multi-channel approach integrating various sources including extension services, digital tools and demonstration farms, can enhance the adoption of best practices, which on long term can ensure that resources are used efficiently and in a sustainable manner.
Aims: To identify the best communication channels tailored to the needs of farmers from the grazing sector in Romania.
Materials and Methods: Data was gathered through a web-based survey during November 2022-March 2023, respondents being farmers, advisors and other stakeholders. The data was analysed using descriptive statistics and hypothesis testing. A P-value less than 0.05 was considered significant.
Results: Findings reveal which grazing knowledge are considered as relevant to farm needs and which are the means used to acquire the needed information. Access to reliable, updated and context-specific information is crucial, and farmers often use a variety of sources to keep informed.
Conclusion: Farmers can be better prepared to address challenges and opportunities related to grazing management by using various sources of information to stay informed. Findings provide insights for policymakers and practitioners aiming to strengthen the AKIS in Romania.

Keywords: AKIS, dissemination tools, grazing

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SUSTAINABILITY ASSESSMENT OF ROMANIAN GRAZING FARMS. PRELIMINARY RESULTS FROM GRAZING4AGROECOLOGY FARM SELFASSESSEMENT TOOL

Ionel Mugurel JITEA*, Adrian GLIGA, Daniel CHICIUDEAN, Vlad ISARIE, Valentin MIHAI, Felix ARION and Diana E. DUMITRAȘ

Faculty of Horticulture and Business in Rural Development, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania
*Corresponding author, e-mail: mjitea@usamvcluj.ro

Introduction: Sustainability research has known important developments in the last decade. It emphasises appropriate innovative solutions such as to reduce human environment pressures in a social acceptable approach. In the European Union, there were a lot of findings aiming to reduce the environmental costs of food production under the latest EU Green Deal targets. Agroecology proved to be one of the promising farming practices that work with nature to meet food security demands. Moreover, grazing can bring positive effects on farm economy, as well as for the society (Van den Pol-van Dasselaar *et al*., 2020).
Aims: The paper aims to present an innovative and user-friendly tool developed in the Grazing4Agroecology EU thematic network. The first results of its implementation in a network of Romanian farms are also presented.
Materials and Methods: Literature reviews under the Grazing4Agroecology thematic network revealed that there are numerous tools to assess farm sustainability, but they are not user-friendly. Qualitative indicators that can be easily assess by farmers around the five agro-ecological principals proposed by Dumon *et al*. (2013): improve animal health; reduce inputs and pollution; enhance diversity; and preserve biodiversity, were selected by experts from the scientific literature and then refine in expert's meetings and farm's test. This paper uses the G4AE farm self-assessment tool to present some preliminary results from Romania.
Results: Findings show that the sampled Romanian farms present important drawbacks, especially in the input and pollution reduction agroecological indicators. Extending grazing agroecological practices can bring economic and animal welfare benefits for farms.
Conclusion: Romanian farmers can use such agroecological grazing practices to optimize the economic and environment performance of farms. Solutions are available, but farmers and advisers need to understand their benefits.

Keywords: agroecology, grazing, farm self-assessment tool

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QUALITY SCHEMES IN THE VIEW OF TELEMEA CHEESE CONSUMERS IN ROMANIA: DRIVER OF CHANGE FOR COMPETITIVE MARKETING STRATEGIES

Corina A. MAREŞ and Diana E. DUMITRAŞ*

Faculty of Horticulture and Business in Rural Development, University of Agricultural Sciences and Veterinary Medicine, Cluj-Napoca, Romania
*Corresponding author, e-mail: ddumitras@usamvcluj.ro

Introduction: The perception that food produced under a quality system is of higher quality could influence consumer choice. Consumer and producer protection, rural development, preservation of rural culture (Angowski *et al*., 2020), uniqueness and product traceability are some of the characteristics that define a quality scheme. Apart from the quality schemes of the European Union, there are national schemes, voluntary certifications at both national and international levels, offering consumers additional information on the quality characteristics of products.
Aims: Understanding the level of knowledge of quality schemes, the buying intentions and the willingness to pay for telemea cheese with quality certification label.
Materials and Methods: Data was collected via an online questionnaire, respondents being consumers of telemea cheese from Romania. Descriptive statistics and hypothesis testing was used to analyze the data. A P-value<0.05 was considered significant.
Results: A moderate level of knowledge regarding the quality schemes was found among consumers of telemea cheese, with a higher percentage in the case of national quality labels. When it comes to telemea cheese with a quality certification mark, about half of the respondents are willing to pay an additional 10%. Their willingness to pay more decreases when the quality certification process justifies the price increase.
Conclusion: Initiatives to highlight the advantages of food products with quality schemes are required to raise consumer awareness. The findings could contribute to developing an innovative certification system for local agricultural and food products that complies with EU regulations and builds consumer trust. The findings may also be used to develop marketing strategies to increase the value of locally produced agricultural and food products.

Keywords: cheese, consumer preference, marketing, quality label, WTP

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SCENARIOS REGARDING COVERING THE RISKS FOR THE GARLIC CULTURE IN THE CONTEXT OF CLIMATE CHANGE

Ancuța MARIN, Diana-Maria ILIE*, Steliana RODINO, Vili DRAGOMIR and Rozi Liliana BEREVOIANU

Research Institute for Agricultural Economy and Rural Development, Bucharest, Romania
*Corresponding author, e-mail: necula.diana@iceadr.ro

Introduction: The effects of climate change are increasingly visible both internationally and at the level of Romania. These are represented by intense heat waves, prolonged drought followed by violent rains, blizzards, hail, floods or wildfires. The National Meteorological Administration has carried out a series of studies at the level of Romania, according to which there are 5 dry years in every decade. Romania is affected by the impact of global warming by increasing the intensity and amount of precipitation, for short periods of time, which favors floods. The garlic crop has a high potential, being in great demand among Romanian consumers, but like any field crop, it is vulnerable to climatic hazards. In order to maintain the economic viability of vegetable farms, the state grants subsidies for the year 2024 according to the plans in the National Strategic Plan (PNS) of Romania. For the garlic crop, in addition to the aid schemes programmed through the PNS, the Romanian state, through a multiannual government program, grants a "de minimis aid for the application of the garlic production support program". In order to reduce production losses due to climatic factors (drought, hail, floods, torrential rains, frost), we analysed several scenarios regarding the risks, depending on the stage of the garlic crop at the time of the occurrence of extremes weather phenomena and its degree of calamity.
Aims: Considering the importance of culture, we are to calculate the necessary compensation amounts according to culture technologies, in order to reduce/cover calamity risks.
Materials and Methods: Within the investigation, several scenarios of the occurrence of extreme weather phenomena that affect the garlic crop are to be considered. The crop will be evaluated in different stages of development, and we will calculate the amounts required for compensation according to the culture technologies.
Results: The results of the research will form the basis of the substantiation of income and expenditure budgets, allowing farmers to better manage their material expenses and farm capacities in order to increase their performance with a low impact on the environment, at the same time emphasizing the importance of implementing the support schemes granted to farmers in the vegetable sector.
Conclusion: In the present paper, we have demonstrated that new crop technologies must foresee the risks and the possibilities of reducing losses in case of partial or total calamity of a crop.

Keywords: garlic, production, risk

DRIVERS TO SUPPORT THE TRANSITION TO CLIMATE-SMART AGRICULTURE IN ROMANIA

Valentin C. MIHAI[1], Iulia S. DAN[1]*, Ionel M. JITEA[1], Diana E. DUMITRAȘ[1], Mihaela MIHAI[1], Răzvan POPA[2] and Cătălin DRAGOMIR[3]

[1] *Faculty of Horticulture and Business for Rural Development, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania*
[2] *ADEPT Foundation, Saschiz, Romania*
[3] *National Research-Development Institute for Biology and Animal Nutrition - IBNA Balotesti, Romania*
*Corresponding author, e-mail: iulia-sorina.dan@student.usamvcluj.ro

Introduction: Agricultural production is seriously threatened by global climate change, as some of the biggest challenges of this century are considered to be lowering greenhouse gas (GHG) emissions and guaranteeing food security. Climate-Smart Agriculture (FAO, 2024) is an approach to help people managing agricultural systems respond effectively to climate change, by knowing and understanding CSA barriers and drivers.
Aims: By analysing the elements of climate-smart agricultural system in Romania, the aim of the research was to identify the main drivers to sustainably increase farms' productivity and incomes, by adapting to climate change and reducing greenhouse gas emissions where possible.
Materials and Methods: The results obtained for Romania in a previous Climate Smart Advisors Project study (Suomela *et al*., 2023) prompted this research. The literature review was applied to reveal the key forces behind Romanian farmers' efforts to reduce greenhouse gas emissions and adjust to climate change.
Results: The main CSA drivers identified were: management measures, such as no tillage, crop rotation; financial incentives, such as carbon credits, government subsidies; policy and institutional support; advances in technology, increasing consumer awareness of climate change etc. The study also highlights the importance of agricultural advisors by enhancing their ability to offer targeted advice and impactful methods on climate mitigation and adaptation approaches.
Conclusion: CSA is an approach that incorporates several components anchored in local settings rather than a collection of activities that can be used everywhere. Thus, CSA encompasses investments, institutions, regulations, technology and actions on and off the farm.

Keywords: agriculture, drivers, Romania, smart

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RURAL DEVELOPMENT IN ROMANIA: EVOLUTION AND TRENDS OF THE SMART VILLAGE CONCEPT

Mihaela PILA

Faculty of Engineering and Agronomy from Brăila,
"Dunărea de Jos" University of Galați, Romania
Corresponding author, e-mail: Mihaela.Pila@ugal.ro

Introduction: Reducing the disparities between rural and urban areas is a European priority, with various funding measures allocated in this direction (European Commission, 2024). In Romania, there are several initiatives to develop Smart Village-type rural localities, with many counties just beginning (Epure *et al*., 2024).
Aims: Assessment of the development stage of the Smart Village concept in Romania within the European context, identifying the factors that either promote or hinder the evolution of the process at the national level.
Materials and Methods: Open access sources were used for documentation. Information by Smart Village, provided by European Commission and Romania was selected and processed. The results were interpreted and figures were created and analyzed.
Results: Approximately 21% of Europe's population resides in rural areas. The migration of rural populations to regions with better educational services, higher-paying jobs and improved access to healthcare, has led to the decline of villages and a reduction in investments in infrastructure and public services (EC, 2017). The use of smart technologies and innovative economic solutions can foster sustainable development, improve the quality of life and enhance the overall well-being of rural residents (ARSC, 2024). Since 2022, about 220 Smart Village projects have been implemented in 147 communes across 7 counties in Romania. Nine Romanian villages already have between 4 and 7 projects implemented.
Conclusion: There has been registered a progress in developing the Smart Village concept in Romania. An engaged and responsible local administration can attract European funds and sustainably develop rural areas. In the coming period, about 50% of Romanian villages could become smart. The small size, a more involved local community and good flexibility in project implementation are advantages of the rural environment.

Keywords: funds, Romania, rural development, smart village

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THE USAMV CLUJ-NAPOCA LIBRARY - SUPPORT FOR THE TRAINING OF FUTURE SPECIALISTS TO RESPOND TO THE GOALS OF SUSTAINABLE RURAL DEVELOPMENT

Cristina Florica SELICEAN* and Marioara ILEA

Faculty of Horticulture and Business in Rural Development, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca
*Corresponding author, e-mail: cristina-florica.vasiu@usamvcluj.ro

Introduction: Education plays an important role within a sustainable global development and is essential for the fulfillment of all 17 Sustainable Development Goals. Universities are starting to train the new generations of specialists who will meet the objectives of sustainable development.
Aims: The purpose of the hereby study was to identify if the USAMV Cluj-Napoca (UASVM-CN) Library has proper specialty educational resources, if such materials respond to the sustainability demands and how are they used by students.
Materials and Methods: For the analysis of educational resources, the Liberty 5 database and the registers with the publications fund were queried. For the specialty fund of the faculties a list of existing publications, according to the educational plan, was made. The report no. titles/no. students was carried out. Also, a list of publications was made for each year starting with 2004, analyzing each position in order to establish the sustainability objective and to which pillar of sustainability it belongs. For the use of the publications' fund, reports were made regarding the loan for the last 20 years, as well as for the period September 30, 2023- March 31, 2024.
Results: As a result of the current investigation, it was found the existence of specialty fund for each faculty within UASVM-CN. The report no. titles/no. students is currently higher for animal sciences, followed by agriculture, horticulture, forestry, food science and veterinary medicine. The existence of publications dealing with the three pillars of sustainability was noted for the entire interval investigated, thus in the last 20 years. Regarding the loan of the materials by students, it suddenly decreases starting with the year 2017. Also, it is higher at the beginning of the academic year and during the examination periods. Most loans fall under the social pillar, followed by the environmental and the economic pillars.
Conclusion: The UASMV-CN library has a significant specialty fund and publications that deal with sustainability. Unfortunately, their use drops sharply from 2017. Report considering no. titles/no. students is higher for older faculties in the university. Most of the borrowed publications belong to the social pillar.

Keywords: library educational resources, rural development, sustainable development

FOOD SAFETY INCIDENTS: AN ANALYSIS OF WITHDRAWALS AND RECALLS ON THE ROMANIAN MARKET

Silvius STANCIU

Faculty of Food Science and Engineering, "Dunărea de Jos" University of Galați, Romania
Corresponding author, e-mail: sstanciu@ugal.ro

Introduction: Recall/withdrawal of food products from the market occurs in situations of non-compliance with safety and quality standards, with potential threats to consumer health. The main issues targeted are related to chemical or microbiological risks, incorrect labeling, or inadequate packaging (Conduleț *et al*., 2023).
Aims: Evaluation of the main causes of food recalls from the market, with the identification of adapted preventive measures and reduce the impact on the market.
Materials and Methods: Information provided by public EC (2024) and Romania (ANSVSA, 2024) was selected and statistically processed. An online survey using Google Forms was used for the market study. The results were graphically presented and interpreted.
Results: At the European level, 75 food batches were withdrawn from the market (2020-2024), none following any notifications from Romanian authorities. On the Romanian market, ANSVSA requested the withdrawal/recall of 361 food products from the market between 2016-2024. Frequently notified are fruits and vegetables, confectionery-ice cream, pastries, other bakery products, meat and meat products. The analysis of Romanian consumers' opinions had 536 respondents. Most consumers have heard about these actions by the authorities and consider them positive. Consumer confidence in companies with recalled products is affected, refusing to purchase products incriminated. To reduce the negative impact, open communication from the business environment, campaigns about food safety and recall procedures are recommended.
Conclusion: The research results show fluctuating trends in food recalls from the Romanian market. There are fewer notifications from Romania in RASFF compared to other countries. The impact of product recalls on local consumer preferences is significant, necessitating public information campaigns and a more open attitude from related companies.

Keywords: food, recall, Romania, safety, withdrawal

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FOUNDATION OF AN AGRICULTURAL COOPERATIVE FOR PROCESSING VEGETABLES AND FRUITS IN THE RURAL AREA OF ROMANIA

Călin VAC*, Maria VAC, Marius SABĂU, Lucica ARMANCA and Ileana ANDREICA

Faculty of Horticulture and Business in Rural Development, University of Agricultural Sciences and Veterinary Medicine, Cluj-Napoca, Romania
*Corresponding author: calin.vac@usamvcluj.ro

Introduction: Agricultural cooperatives for the processing of vegetables and fruits aim at strengthening their market position and optimizing their operations through a cooperative system. This associations allow agricultural producers to benefit from economies of scale, access to advanced processing technologies and improved quality of their products.
Aims: Considering the current socio-economic context, the present study aims to identify the interest of the farmers from rural areas of Romania in joining an agricultural cooperative, in order to promote collaboration between members of the farming community, supporting their access to modern equipment, advanced technologies and expertise by accessing funding from the EU.
Materials and Methods: A questionnaire was applied to the farmers from the NW region of Romania, and their answers were analysed. At the same time, we studied the components of a feasibility study for the 22 field of investments, in order to access financing for the establishment of a processing cooperative.
Results: Through an extensive questionnaire, the team gauged farmers' perceptions on the advantages and potential risks associated with cooperative membership. The study delved into the significance of farmers joining an agricultural cooperative to leverage collective strength, pool resources and access markets efficiently. The financial analysis included the calculation of financial performance indicators: cumulative cash flow, net present value, internal rate of return, financial sustainability.
Conclusion: The results showed that the farmers from rural areas in Romania are interested to be part of the cooperatives, as well as with the support of the financial performance indicators calculated in the feasibility study. This study not only highlighted the cooperative benefits, but also pinpointed areas that needed mitigation strategies.

Keywords: agricultural cooperatives, rural areas, vegetables and fruits

SUPPORTING THE CERTIFICATION PROCESS OF A PGI CHEESE IN TRANSYLVANIA

Cherry VILLACORTA[1], Emmanuel Kwofie, Mercy KILEL[1], Fabiana IRIGOYEN[1] and Felix H. ARION[2]*

[1] *Master of Science Food Identity, L'Ecole supérieure des Agricultures France*
[2] *University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca*
*Corresponding author, e-mail: felixarion@usamvcluj.ro

Introduction: It was already conducted by AgroTransilvania Cluster a preliminary assessment to determine the feasibility and eligibility of the cheese product for PGI certification, by reviewing the EU regulations governing PGI certification to understand the requirements and criteria that must be met. It was, also, assured the engagement of the relevant stakeholders including local cheese producer, farmers, agricultural organizations, and government authorities.
Aims: The main objective of the case study is to support the certification process of a Protected Geographical Indication (PGI) cheese in Transylvania by involving students in several key steps to ensure compliance with the regulations and requirements set forth by the European Union (EU).
Materials and Methods: Literature review and study cases analysis were undertaken for being familiarised with the concept and the good practice models, also studying the PGI certified chess for purposing a set of analysis to be carried on by the association that intend to apply for PGI certification in order to certified the products, including the labs accredited.
Results: The results support the association that intend to apply for PGI certification by offering valuable information about the product specification steps and requirements, in order to develop a detailed specification for the PGI cheese product, outlining its unique characteristics, production methods and geographical origin, to be aligned with the requirements outlined in the EU regulations.
Conclusion: By studying similar cases, there are shown up the necessary certification specificities in order to assure the specificity of the cheeses measures to ensure consistency and adherence to the product specification throughout the production process and to impose the standards for sourcing raw materials, production techniques, aging processes, and packaging

Keywords: AgroTransilvania Cluster, certification, EU, PGI

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PROPOSING A NEW QUALITY LABEL CERTIFYING GRAZING PRODUCTS IN ROMANIA

Filippo ZAFFARONI[1], Nattida KANCHANAKUL[1], Blandine LACOMBE[1], Zeeshan RASHEED[1], Vlad ISARIE[2]* and Felix H. ARION[2]

[1] *Master of Science Food Identity, L'Ecole supérieure des Agricultures France*
[2] *University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca, Romania*
*Corresponding author, e-mail: vlad-ilie.isarie@student.usamvcluj.ro

Introduction: It was already conducted by USAMV Cluj-Napoca and by AgroTransilvania Cluster, which are both partners in Horizon projects, a preliminary market research to assess the demand for grazing products in Europe and identify potential stakeholders, including farmers, producers, consumers, government agencies, and relevant industry associations. Also, it was defined the scope and criteria for grazing products eligible for certification under diverse labels. This may include dairy products, meat, eggs, and other agricultural products derived from animals raised primarily on pasture.
Aims: The main objective of the case study is to propose a new quality label certifying grazing products in Romania, promoting consumer confidence, supporting sustainable agriculture, and enhancing the competitiveness of Romanian agricultural products on the domestic and international markets.
Materials and Methods: Methodology included: review existing standards, by conducting a comprehensive review; define product categories; identify key quality parameters and criteria that define the characteristics of high-quality grazing products; define requirements for pasture management; encourage the preservation of traditional grazing landscapes and the use of native forage species.
Results: The results support the development of a comprehensive quality standard and specifications for grazing products, outlining criteria related to animal welfare, pasture management, feed quality, environmental sustainability and product traceability. That will consider ensuring that the standards align with best practices, international guidelines and regulatory requirements, while reflecting the unique characteristics of Romanian grazing systems.
Conclusion: It was created a valuable certification process design, by design certification process, by defining the roles and responsibilities of stakeholders and by proposing procedures for certification.

Keywords: AgroTransilvania Cluster, certification, EU, grazing

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SESSION 6: ANIMAL SCIENCE

FARM ANIMAL WELFARE IN SUSTAINABLE DEVELOPMENT

Jenny YNGVESSON[1] and Jessica STOKES[2]

[1] Faculty of Veterinary Medicine and Animal Science, Swedish University of Agricultural Sciences, Sweden, [2]Agriculture, Science and Practice, Royal Agriculture University, UK.
*Corresponding author, e-mail: jenny.yngvesson@slu.se

Introduction: Animal welfare is not mentioned explicitly in any of the UN SDGs despite animals being crucial for our life on Earth.
Aims: In this talk we want to highlight the fundamental role of farm animal welfare in sustainable food production and emphasise the importance of stakeholder driven development of farming.
Results: Farm animal welfare was ignored when formulating the 17 SDGs and a number of papers have highlighted this paradox (e.g. Keeling et al. 2022; Schapper & Bliss 2023). Animals, and their welfare, are crucial not only for our survival globally, but also a core feature of a thriving, ethical society. There are two well-known frameworks for the systematic connections between sustainability and animal welfare; OneHealth (WHO) and OneWelfare (Pinillos et al. 2016). These frameworks or concepts both demonstrate the ultimate interconnections between humans, animals and environment and serve as frameworks for research and practice. Examples of overarching sustainability aspects of farm animal welfare are antibiotic resistance in bacteria and biodiversity in grazing land. As farm animals are cared for and managed by farmers, farmers need to be in the driving seat of development towards sustainability and with support to innovate, they have the potential to do so (Stokes et al. 2022).
Conclusion: Animal welfare needs to be part of the systematic work to reach the UN SDGs.

Keywords: *OneWelfare, OneHealth, collaboration, farmer innovations, PATHWAYS*

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IDENTIFICATION AND ANALYSIS OF PROCESSING AND CONSUMPTION CHARACTERISTICS OF FISH IN RESTAURANTS IN BUCHAREST-ILFOV AREA

Cristian CRISTEA[1*], Monica Paula MARIN[1], Gratziela BAHACIU[1], Elena Narcisa POGURSCHI[1], Ionela Florentina (ENACHE) TOMA[1], Gheorghe DOBROTĂ[2], Carmen Georgeta NICOLAE[1]

[1]Faculty of Animal Production Engineering and Management, University of Agronomic Sciences and Veterinary Medicine, Bucharest, Romania
[2]Fish Culture Research and Development Station, Nucet, Dâmbovita County, Romania
[*]Corresponding author, e-mail: cristea.cristi@gmail.com

Introduction: Fish consumption in restaurants in Romania is a complex phenomenon, influenced by a number of economic, political, cultural and ecological factors. The processing and consumption of fish in the restaurant industry is of significant importance in terms of both health and nutrition and global consumption trends that support a sustainable and innovative approach to gastronomy. In the context of a growing demand for fish dishes, this report explores the characteristics of the fish processing and consumption market in Romanian restaurants, with a special focus on the Bucharest-Ilfov area.
Aims: The purpose of this study is to identify and analyze the factors that influence the consumption of fish in restaurants in Romania and to provide recommendations for improving menus and increasing sustainability in this sector.
Materials and methods: The analysis is based on a synthesis of available data on culinary preferences, sources of supply and current trends in fish consumption. Case studies were also carried out in restaurants in the Bucharest-Ilfov area to better understand the dynamics of the local market.
Conclusion: The results indicate that diversifying menus by introducing more fish dishes can bring significant benefits to restaurants, both economically and operationally. Fish also proves to be a versatile and sustainable raw material, which, if used correctly, can attract new segments of consumers concerned about health and sustainability.

Keywords: culinary trends, eating habits, menu, supply sources, sustainability.

EU PIG FARM WELFARE: NAVIGATING CHALLENGES AND EMBRACING OPPORTUNITIES

Ioan I. LADOȘI[1], Daniela LADOȘI[1], Aurelia COROIAN[1], Alexandru DEAC[1], Tudor PĂPUC[1] Raul SAVIN[1], Marius ZĂHAN[1]

[1]Faculty of Animal Science and Biotechnologies, University of Agricultural Science and Veterinary Medicine Cluj-Napoca, Romania
**Corresponding author, e-mail: ioan.ladosi@usamvcluj.ro*

Introduction: Based on current statistical data, 26% of the world's pig meat is produced by European pig farmers. Over the last several decades, animal welfare has been a major concern for the majority of European pig farmers, who have had to comply with a number of EU rules and increased market and public pressure to produce more sustainably produced pork. The following are the main pig-related focused themes: a) prohibiting the confinement of sows during farrowing and artificial insemination; b) taking into account substitute methods to lessen the discomfort associated with castration, tail docking, and teeth grinding; c) allocating space and enrichment materials; d) establishing welfare criteria for transportation and slaughter.
Aims: The primary goal of this evaluation is to pinpoint the primary areas of concern, mostly from the standpoint of the producer, while also searching for potential future prospects. Although it is commonly acknowledged that customers want more welfare from livestock farms, the general public interprets this idea differently than farmers do.
Materials and Methods: Performing a thorough analysis of the current status of the challenges and opportunities related to the implications and application of welfare standards in pigs is, by it self, a complex task considering not only the volume of the legislation in force in the MS, but the amount of research tackling the various aspects of the welfare in farms with different sizes, level of technology and management skill set.
Conclusion: Farmers clearly want to change and to lead the process, but in order to accomplish this aim and share lessons learned with farmers around Europe, it is crucial to pool the best existing experiences through the WelFarmers Horizon project.

Keywords: EU legislation, pig farming, WelFarmers, welfare.

SUSTAINABLE GROWTH POULTRY SYSTEMS AND MEAT QUALITY. A REVIEW

Veronica Denisa LUNGU[1], Andreea Ionela ZINCA[1*], Roxana Elena (VASILIU) ŞTEFAN[1], Iuliana Ştefania (BOLOLOI) BORDEI[1] and Dumitru DRAGOTOIU[1]

[1] *Faculty of Animal Productions Engineering and Management, University of Agronomic Sciences and Veterinary Medicine of Bucharest, 011464, 59 Mărăşti Blvd, District 1, Bucharest, Romania*
*corresponding author: zinca_andreea20@yahoo.com

Introduction: Sustainable growing systems include practices such as free growing, the use of organic feed, and reducing growth density. These systems are designed to reduce the ecological footprint of poultry production and to promote animal welfare.
Aims: Through this study I want to explore the impact of sustainable and organic breeding systems on the quality of poultry meat, focusing on organic farming practices and biological feeding.
Materials and Methods: We conducted an exhaustive search for scientific articles published in databases such as PubMed, Scopus, Web of Science, and Google Scholar, using keywords such as "sustainable poultry growth", "quality of poultry meat", "organic farming practices", "impact on poultry health" and "ecological poultry products". We have included studies published over the last 10 years, as well as older articles relevant to understanding the evolution of sustainable breeding practices in the poultry industry.
Results: Studies have shown that poultry raised in sustainable systems have superior meat quality in terms of taste and texture. For example, chickens raised freely have stronger and more juicy meat compared to those raised in intensive systems (Ferrante et al., 2009).
Conclusion: Sustainable and environmentally friendly breeding systems not only improve the welfare of chickens but also produce high-quality meat with significant nutritional and sensory benefits.

Keywords: Poultry industry, Meat quality, Sustainable breeding systems, Animal welfare, Environmental impact, Ecological practices.

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PALYNOLOGICAL ANALYSIS AND HEAVY METALS CHARACTERIZATION OF BEE POLLEN AND BEE SAMPLES FROM DIFFERENT ROMANIAN APIARIES

Claudia PAȘCA[1]*, Otilia BOBIȘ[1] and Daniel Severus DEZMIREAN[1]

[1] *Apiculture and Sericulture Unit, Faculty of Animal Science and Biotechnologies, University of Agricultural Science and Veterinary Medicine Cluj-Napoca, Romania*
*Corresponding author, e-mail: claudia.pasca@usamvcluj.ro

Introduction: Bee pollen is a mixture of plant pollen, nectar, honey, enzymes and other bee secretions, collected by bees and stored in the pollen collector device. When the bees come to their hive, the bee pollen falls from their legs in the collector device distributed at the entrance of the bees in hive. The plant sources of bee pollen, as determined by palynological analysis strongly affect its nutritional, physico-chemical, and functional properties. Bees themselves and bee pollen serve as bioindicator of environmental health, as they accumulate substances from their foraging environment, including potential contaminants like heavy metals. And we can see the transability of these trace elements from plants to bees and from bees to bee pollen.
Aims: Identification the melliferous potential in different regions of Romania and characterize the botanical origin for the bee pollen samples and the heavy metals contain from bees and bee pollen samples.
Materials and Methods: For this purpose, five bee samples and twenty-three bee pollen samples purchased from 5 apiaries (Cluj, Mureș, Sălaj, Maramureș and Dolj) were analyzed. The analysis were done in the Laboratory of Quality Control of Bee Products and Diagnosis in Bee Diseases, UASVM Cluj-Napoca.
Results: The bee pollen samples collected from different apiaries were determined to come from the following predominant species: *Taraxacum officinale, Abies pectinata, Pruns spp., Rubus idaeus, Trifolium pratense, Medicavo sativa, Sambucus nigra, Acer tartaricum, Medicavo sativa, Brassica napus, Brassica rapa, Crataegus monogyna, Filipendula ulmaria, Bellis perennis, Robia pseudoacacia, Malus domestica, Helianthus annuus, Cucumis Satives, Prunus domestica, Prunus avium.* The traceability of heavy metals from bees to bee pollen collected by them records significant values for Pb in samples collected from Cluj (3.29 mg/kg), Dolj (3.80 mg/kg) and Maramureș (2.20 mg/kg), in the case of bee samples, and for bee pollen significant values were recorded in bee pollens from the same localities, while Cu and Ni contents are frequently found in all the samples studied.
Conclusion: Analyzing the five geographical areas and the intake of mineral elements, it can be concluded that Dolj is a more polluted geographical area compared to the others, and the consumption of bee pollen with high Pb content can cause intoxication that leads to anemia, brain vessel disease, chronic nephritis, hypertension, decreased learning abilities of children.

Keywords: *Apis Mellifera*, melliferous plants, biomonitoring, botanical origin, laboratory techniques.

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STUDY ON THE GROWTH PERFORMANCE OF RAINBOW TROUT *(ONCORHYNCHUS MYKISS)* FED WITH *TENEBRIO MOLITOR* LARVAE

Camelia RĂDUCU[1], Paul UIUIU[1], Daniel COCAN[1], Radu CONSTANTINESCU[1], Vioara MIREȘAN[1], Camelia MUNTEANU[2] Corina HULUBA[1] and Andrada IHUȚ[1]*

[1] *Faculty of Animal Science and Biotechnologies, UASMV Cluj-Napoca, Romania*
[2] *Faculty of Agriculture Sciences, UASVM Cluj-Napoca, Romania*
*Corresponding author, e-mail: ihut.andrada@usamvcluj.ro

Introduction: Recently, there has been increased attention on edible insects as they represent an excellent, cost-effective source of protein with a low environmental footprint (Queiroz et al., 2023). *Tenebrio molitor* (Tm) is the perfect match. This species can replace conventional protein sources and therefore has the potential to be used in many different products.
Aims: This study aims to substitute commercial feed for rainbow trout with Tm larvae.
Materials and Methods: The biological material consisted of rainbow trout fry. Two groups of 50 specimens each were established. The experimental group was fed exclusively with dried larvae of Tm, while the control group was fed with commercial granulated feed. Growth performance was assessed over 12 weeks, with weightings every 2 weeks.
Results: The study found that after two weeks of transitioning from a granulated diet to dried Tm larvae, the experimental group showed increased body mass. Interestingly, the control group presented higher growth rates probably due to being accustomed to this type of feed. Normally, the fish identified granulated feed more easily than Tm larvae.
Conclusion: Therefore, despite the elevated protein content of Tm larvae, their incorporation into commercial feed should be in granulated form to expedite feed recognition by fish. Another possibility is to administer these larvae for a longer period.

Keywords: protein source, sustainable aquaculture, *Tenebrio molitor.*

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ALTERNATIVE FEED SOURCES AND MILK QUALITY ENHANCEMENT

Roxana Elena (VASILIU) ŞTEFAN[1], Andreea Ionela ZINCA[1], Veronica Denisa LUNGU[1], Livia VIDU[1], Iuliana Ştefania (BOLOLOI) BORDEI[1], Viorica CONSTANTIN[1]*and Monica Paula MARIN[1]

[1] *The Faculty of Animal Productions Engineering and Management, University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Marasti Blvd, District 1, Bucharest, Romania*
*Corresponding author, e-mail: ktinmou@yahoo.gr

Introduction: Agro-industrial by-products and bakery products, rich in bioactive compounds such as polyphenols, can improve the nutritional quality of animal products (Halmemies-Beauch et-Filleau et al., 2018; Correddu, et al., 2023).
Aims: The aim of this paper is to explore and evaluate the use of alternative feed sources, such as agro-industrial by-products and bakery products, as alternative feeds for dairy cows.
Materials and Methods: The completion of this study was carried out with a detailed examination of other relevant scientific articles on the chosen subject in the MDPI, Google Scholar, and PubMed databases.
Results: Agro-industrial by-products, rich in polyphenols, have a positive impact on the fatty acid composition of milk and the overall health of animals. Polyphenols from grape pomace and pomegranate can improve the nutritional quality of animal products by influencing biohydrogenation in the rumen and the fatty acid composition of milk (Messaoudene et al., 2022).
Conclusion: Using agro-industrial by-products and bakery products as animal feed offers a sustainable and cost-effective solution to reduce feed costs and improve the nutritional quality of animal products.

Keywords: agro-industrial by-products, dairy cows, fatty acids.

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LOW-PROTEIN DIET BALANCED FOR ESSENTIAL AMINO ACIDS SHOWS ENVIRONMENTAL AND ECONOMIC ADVANTAGE IN DAIRY PRODUCTION

Antal VIGH[1,2,*], Jessie GUYADER[1] and Claudia PARYS[1]

[1] *Evonik Operations GmbH, Hanau, Germany*
[2] *University of Agricultural Sciences and Veterinary Medicine, Cluj-Napoca, Romania*
[*]Corresponding author, e-mail: antal.vigh@evonik.com

Introduction: Feeding high-protein diets to dairy cows leads to poor nitrogen (N) efficiency, while over-feeding expensive protein sources is economically unprofitable without improving production performance. Reducing dietary crude protein (CP) seems to be a viable environmental and economic strategy, however essential amino acids supplementation is required to prevent performance losses.
Aims: Evaluate the effects of reducing CP level in dairy cows' ration while supplementing a rumen-protected methionine [Mepron®, 85% DL-methionine, Evonik Operations GmbH] on production, nitrogen excretion and economics in lactating cows.
Materials and Methods: This study was conducted at Schothorst Feed research (The Netherlands) during a 1-wk covariate and 10-wk experimental period. A total of 40 Holstein cows (58 ± 4 DIM; 39.6 kg ± 8.1 kg/d milk) were divided in two experimental groups, fed either a high-CP diet (CON) or a low-CP diet supplemented with 0.05% Mepron® (RPM). Individual dry matter intake (DMI) and milk yield (MY) were recorded daily. Milk composition was analyzed weekly. Nitrogen excretion was quantified in feces and urine during wk 10. Statistical effects of the treatment were analyzed in R based on a model including the initial performance (as covariate), treatment, week and their interaction as fixed effects, and cow as random effect. For farm economics, the monthly income over feed cost (IOFC) for a 100-cow farm was calculated based on DMI, average performance and raw material prices (Jan. 2023).
Results: On average, DMI, MY and milk composition were similar between groups. Nevertheless, between wk 1 and wk 10, MY dropped by 4.8 kg/d in CON, but only by 1.5 kg in RPM (P=0.021). Milk protein yield decreased by 57 g/d in CON, while it increased by 61 g/d in RPM (P=0.035). Total manure N decreased by 12% in RPM (P=0.036). The monthly IOFC increased by 297€/100 cows.
Conclusion: Reducing dietary CP while supplementing Mepron® improves the persistence of milk and milk protein yield, decreases N excretion into the environment, while increasing the profitability of a dairy farm.

Keywords: rumen-protected methionine, low-protein diet, nitrogen excretion.

COMPARATIVE RESEARCH ON THE INFLUENCE OF THE GROWTH SYSTEM AND NUTRITION OF LACTATING COWS ON THE QUALITY AND CHEMICAL COMPOSITION OF MILK

Andreea Ionela ZINCA[1], Veronica Denisa LUNGU[1*], Roxana Elena (VASILIU) ȘTEFAN[1], Iuliana Ștefania (BOLOLOI) BORDEI[1] and Dumitru DRAGOTOIU[1]

[1] *Faculty of Animal Productions Engineering and Management, University of Agronomic Sciences and Veterinary Medicine of Bucharest, 011464, 59 Mărăști Blvd, District 1, Bucharest, Romania*
*corresponding author: veronica.lungu95@yahoo.com

Introduction: Milk is an essential food in the human diet because it is of particular nutritional importance. The composition and quality of milk can vary significantly depending on: breed, nutrition, animal breeding system, health status, stage of lactation and environmental conditions (Linehan, 2024; Schwendel, 2015).
Aims: The main objective of this work is to investigate how the diet and the maintenance system affect the composition and quality of milk.
Materials and Methods: The comparative analyses were carried out on three batches of cows for each county (Buzău, Dâmbovița). From Buzău county we collected milk from the farm FB1 (n=15), FB2 (n=550), FB3 (n=1320), and in Dâmbovița county we collected milk from the farm FD1 (n=14), FD2 (n= 450), FD3 (n=1260).
Results: Extensive system milk recorded higher values of somatic cells and lower values of fat, protein, lactose, urea and solids, the values recorded are not constant every month. The milk from the extensive system recorded the best values of the chemical composition.
Conclusion: In conclusion, there are significant differences in milk quality and composition depending on the rearing system used and the nutrition of cows.

Keywords: cow farm**,** extensive system, intensive system, milk cow, milk quality.

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SESSION 7: BIOTECHNOLOGY

THE ROAD TO BIOGLASS

Sara BOTEZAN[1], Răzvan ȘTEFAN[2] and Daniel Severus DEZMIREAN[1]

[1] *Faculty of Animal Sciences and Biotechnologies, University of Agricultural Sciences and Veterinary Medicine, Romania*
[2] *Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine, Romania*
[*]Corresponding authors, e-mail: sara.botezan@student.usamvcluj.ro

Introduction: Phosphate glasses are known for their low chemical resistance, reflected in their fast rates of dissolution in aqueous media. The structural and bioactive features of these glasses can be altered by doping them with various metallic ions. These ions are released into the surrounding tissue and dissolve in biological fluids upon introduction into the body. Bioglass is the term that encompasses the class of glass composites that manifest bioactivity and form a biocompatible layer when in contact with body fluid. Bioglasses have numerous applications and can be successfully used in tissue engineering, thanks to their biocompatibility and bioresorbability.
Aims: The aim of the present research is to synthesize and characterise a biodegradable, soluble Sr-doped phosphate glass and investigate the dissolution rate and influence on pH of its derived phosphate glass powders.
Materials and Methods: Three glass samples containing phosphorus pentoxide and strontium oxide were prepared *via* the melt-quenching technique. Next, the glass pieces were ground into fine powders using agate mortar and pestle, and sieved to obtain known particle sizes between 25 and 45 μm. Then the samples were characterized using dissolution tests, the influence on pH, SEM-EDX and ICP-OES.
Results: Three Sr-doped phosphte glass samples with different composition ratios were successfully synthesized and characterised using the aforementioned techniques. However, the obtained samples did not have the desired solubility in ultrapure water, due to the presence of Sr in their composition, which resulted in high resistance of the vitreous material. The desired result would have been the complete dissolution. Nevertheless, the glass extracts obtained post dissolution can be used as treatments on cell cultures, which is the next step in this ongoing experiment.
Conclusion: In this work, we synthesized and characterised three glass samples doped with Sr ions. Although the complete dissolution of the samples was not obtained, the liquid glass extracts will be tested on cells and new glass compositions will be synthesized and tested for complete dissolution.

Keywords: bioglass, dissolution, pH, phosphate.

RESEARCH ON THE INFLUENCE OF DILUTION MEDIA ON RAM SPERM CRYOPRESERVATION

Elena CIBOTARU[1], Grigore DARIE[2], Irina DJENJERA[2], Oleg CHISALITA[3] and Iacob Domnica[2]

[1]Faculty of Agricultural, Forestry and Environmental Sciences, Republic of Moldova, Technical University of Moldova
[2]Practical Scientific Institute of Biotechnologies in Animal Husbandry and Veterinary Medicine, Maximovca village, Anenii Noi District
[3]Institute of Mycrobiology and Biotechnology, Technical University of Moldova
*Corresponding authors, e-mail: cibotaruelena7@gmail.com

Introduction: Ram sperm from the Moldovan Karakul breed bred in the experimental section of the Scientific Institute of Biotechnology Practices in Animal Husbandry and Veterinary Medicine was used in this study. Ejaculates with a mobility of no less than 70% and a concentration of 2.0 billion/ml were selected for processing.
Aim: The aim of the study was to evaluate the effect of a biologically active preparation extracted from cyanobacteria on the cryopreservation of ram sperm using different dilution media.
Materials and Methods: GTJ, STJ, and STJ+ dilution media were used for sperm dilution. The STJ+ medium was enriched with a biologically active preparation extracted from cyanobacteria at the Institute of Microbiology and Biotechnology of the Technical University of Moldova. After thawing, the mobility, rectilinear movements of the spermatozoa, and acrosome integrity were evaluated.
Results: The STJ+ medium, containing the biologically active preparation, resulted in a mobility of 49.2±1.7, rectilinear movements with VAP – 105.5±2.7, VSL – 91.5±4.5, VCL – 170.7±8.5, sperm abnormalities of 14.5%, and acrosome integrity of 24.4±0.4%, outperforming the other dilution media.
Conclusion: The results suggest that the STJ+ medium with the biologically active preparation at a concentration of 0.4-0.7% is recommended for the cryopreservation of ram sperm due to its superior performance compared to the other media.

Keywords: ram, sperm, mobility, dilution, spermatozoa.

TOTAL PHENOLICS, TOTAL FLAVONOIDS AND ANTIOXIDANT ACTIVITY IN CHOKEBERRY, BLACKBERRY AND BLACKCURRANT LEAVES AND BERRIES DURING RIPENING STAGES

Camelia-Ioana IGNĂTESCU[1]*, Adriana Cristina URCAN[1] and Adriana CRISTE [1]

[1] *Department of Microbiology and Immunology, Faculty of Animal Science and Biotechnologies, University of Agricultural Sciences and Veterinary Medicine, Cluj-Napoca 400372, Romania*
*Corresponding author, e-mail: camelia-ioana.ignatescu@student.usamvcluj.ro

Introduction: Recent studies have highlighted intriguing variations between the phenolic composition of fruits and leaves within berry species, indicating that leaves often possess equivalent or higher concentrations compared to fruits during ripening stages.
Aims: The aim was to compare chokeberry, blackberry, and blackcurrant berries and leaves at various ripening stages, with a focus on total phenolic content, total flavonoid content and antioxidant activity.
Materials and Methods: Total polyphenols, flavonoids, and antioxidant activity of ethanolic extracts were evaluated using Folin-Ciocâlteu, $AlCl_3$ and DPPH assays.
Results: In aronia, ethanolic extracts had higher phenolic compounds in berries than leaves, with the highest levels found in unripe fruits (A1). Flavonoid concentration increased with maturity, and young leaves had greater antioxidant capacity than berries. Blackberry extracts reveal a decrease in total polyphenol content as blackberry fruits ripen, contrasting with significant phenolic levels found in leaf extracts, which show an increase during mid-maturation stages. Flavonoid content was highest in half-mature leaves (M6) and lowest in ripening berries (M2). Blackberry fruit extracts mainly indicate higher antioxidant potential compared to leaf extracts. In blackcurrant, greater levels of phenolics were detected in leaves. Young blackcurrant leaves show the highest total phenolic content, followed by mature leaves, while the content in berries increases during ripening but slightly decreases after full maturity. Blackcurrant berries display increasing flavonoid content with maturity, while leaves demonstrate varied levels. Antioxidant values varied between leaf and berry samples, decreasing as the fruit matured.
Conclusion: Leaves generally have higher levels of total polyphenols and flavonoids compared to berries, with antioxidant activity being highest in younger leaves and decreasing as fruits ripen.

Keywords: antioxidant activity**,** berries, phenolics.

AN OVERVIEW OF THE EFFECT OF PREBIOTICS, PROBIOTICS AND POSTBIOTICS ON INTERNAL HONEY BEE PARASITE *NOSEMA SPP*.

Cristina Gabriela MATHE[1], Tudor Nicolas TERNAR[1*], Gianluca ALBANESE[1,2], Alexandru Ioan GIURGIU[1], Adriana Cristina URCAN[1], Claudia PAȘCA[1], Melinda Maria TÓFALVI[1], Massimo IORIZZO[2] and Daniel Severus DEZMIREAN[1]

[1] *Faculty of Animal Science and Biotechnologies, University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca, Romania*
[2] *Department of Agriculture, Environmental and Food Sciences, University of Molise, Via De Sanctis, 86100 Campobasso, Italy*
[*]Corresponding author, e-mail: tudor.ternar@usamvcluj.ro

Introduction: Honey bees are important pollinators that contribute significantly to crop pollination and local flora biodiversity. In recent years it was observed a major decline in the bee populations around the word caused by biotic and abiotic stressors.
Aims: Taking into account that the honey bee health and behaviour can be significantly influenced by *Nosema spp.* infestation, we aim to explore the recent advancements in prebiotics, probiotics and postbiotics administration to enhance the honey bee health.
Materials and Methods: Bibliographical research on the most recent papers on this topic.
Results: A comprehensive analysis of each class of biotics used in the treatment of *Nosema spp*. and their effect based on the current studies.
Conclusion: We strongly believe that the integration of pre-, pro-, postbiotics in beekeping practice can significantly contribute to the biocontrol of the pathogenic agent *Nosema spp.* Moreover, a deeper understanding of the microorganisms that inhabit the gastrointestinal tract of the honey bees (*A. mellifera*), and the substances they produce/consume could contribute to the development of more appropriate products for the biological control of *Nosema spp.*

Keywords: *Apis mellifera, Nosema spp.,* probiotics, prebiotics, postbiotics.

GREEN SYNTHESIS AND CHARACTERIZATION OF BIOACTIVE PROPERTIES OF SILVER, GOLD, TITANIUM AND COPPER NANOPARTICLES MEDIATED BY EXTRACTS OF *SAMBUCUS L.*

Andrei-Lucian PAȘCA[1], Adriana CRISTE[1] and Adriana Cristina URCAN[1]*

[1]*Faculty of Animal Science and Biotechnologies, University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca, Romania*
*Corresponding author, e-mail: adriana,urcan@usamvcluj.ro

Introduction: This study explores the ecological synthesis and bioactive characterization of silver, gold, titanium, and copper nanoparticles, using extracts from *Sambucus* L. fruits, flowers, and leaves as a green synthesis approach.

Aims: The research aimed to develop environmentally friendly methods for nanoparticle synthesis while evaluating their antimicrobial and antioxidant properties.

Materials and Methods: Nanoparticles were synthesized successfully using elderberry extracts, which are rich in polyphenols and flavonoids. The antimicrobial activity of these nanoparticles was evaluated through diffusimetric and microdilution techniques, with spectrophotometric analysis determining the minimum inhibitory concentration (MIC). Additionally, the total polyphenol and flavonoid content of the extracts, along with their antioxidant capacity, were assessed using the DPPH assay.

Results: The results indicated that the elderberry extracts effectively mediated the synthesis of silver, gold, titanium, and copper nanoparticles, which exhibited significant antimicrobial activity against both Gram-positive and Gram-negative bacteria. Furthermore, the nanoparticles demonstrated strong antioxidant properties, correlating with the high levels of polyphenols and flavonoids present in the extracts.

Conclusion: The study confirms that elderberry extracts are a viable and eco-friendly source for the synthesis of bioactive nanoparticles. These nanoparticles exhibit potent antimicrobial and antioxidant properties, promising potential for biomedical and environmental applications.

Keywords: nanoparticles, antimicrobial activity, green synthesis, *Sambucus L*

PLENARY SESSION – FACULTY OF VETERINARY MEDICINE INVITED SPEAKERS

PAPILLOMAVIRUS INFECTION IN RUMINANTS AND HORSES: NEW INSIGHTS AND FUTURE PERSPECTIVES

Franco ROPERTO[1], Cornel CATOI[2] and Sante ROPERTO[3]*

[1]Department of Biology. University of Naples Federico II, Italy.
[2]Department of Pathology, Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine, Cluj-Napoca, Romania
[3]Department of Veterinary Medicine and Animal Productions, University of Naples Federico II, Italy.
*Corresponding author, e-mail: sante.roperto@unina.it

State of the art: Papillomaviruses (PVs) are small, non-enveloped, epitheliotropic, double-stranded DNA viruses that infect the cutaneous and mucosal epithelia in a diverse range of animals, including humans (IARC, 2007).
The bovine papillomavirus (BPV) family is composed of 44 genotypes divided into five genera (PaVE, 2024). Deltapapillomavirus (ðPV) genus comprises four types, namely BPV1, BPV2, BPV13, and BPV14, which are highly pathogenic fibropapillomaviruses (Daudt et al., 2018).
Ovine papillomaviruses (OaPVs, *Ovis aries* papillomaviruses) are viruses with four genotypes (Polinas et al., 2024). OaPV1, OaPV2, and OaPV4 belong to the genus *Deltapapillomavirus*, whereas OaPV3 belongs to *Dyokappapapillomavirus* (PaVE, 2024).
Only two caprine papillomaviruses, *Capra hircus papillomavirus 1* (ChPV1), which belongs to the genus *Phipapillomavirus*, and ChPV2, which are currently unclassified, have been reported (PaVE, 2024).
The equine PV (EcPV) family is composed of ten genotypes grouped in two genera: EcPV1 belongs to Zetapapillomavirus. Dyorhopapillomavirus genus comprises six types, namely EcPV2, EcPV3, EcPV4, EcPV5, EcPV6, EcPV7. Currently, EcPV8, EcPV9, EcPV10 are unclassified.
New Insights: Historically, papillomaviruses are oncogenic viruses being associated with cutaneous and mucosal tumors in several species. In cattle, BPVs are responsible for many skin and bladder tumors. Furthermore, cutaneous tumors of goats, horses and sheep are known to be PV-related diseases. Biologically, PVs are believed to be strictly species-specific infectious agents. However, new diagnostic methods with an improved sensitivity and specificity such as digital PCR allow us to perform new accurate diagnosis of papillomavirus infection.
Future perspectives: Recently, papillomavirus infection has often been associated with reproductive disorders in several species, including humans. Future research will be based on the role, if any, of papillomaviruses in male and female fertility.

Keywords: *BPVs, ChPVs, EcPVs, OaPVs.*

EXPANDING THE FRONTIERS IN VETERINARY PUBLIC HEALTH EDUCATION: THE VIRTUAL SLAUGHTERHOUSE SIMULATOR

Alessandro SEGUINO

Department of Veterinary Medical Sciences, University of Bologna, Italy
*Corresponding author, e-mail: alessandro.seguino@unibo.it

Veterinary surgeons working on farms and at food-processing establishments play a fundamental role in safeguarding public health and animal welfare. The Meat Hygiene curriculum in European veterinary schools needs to equip veterinary students with the skills necessary to satisfy the Day One Competencies (D1C) required by the European Association of Establishments for Veterinary Education (EAEVE). These are underpinned by the European Directives on the recognition of professional qualifications. The D1C in meat hygiene required by students revolve around the ability to conduct ante-mortem and post-mortem inspection of animals presented for slaughter. This aims to contribute to the prevention of foodborne hazards entering the food chain, posing a risk to public health. EAEVE also identifies auditing skills as a required D1C. Ante-mortem inspection, post-mortem inspection, and auditing are the key veterinary tasks carried out according to the European Union Regulation 2017/625 on the delivery of Official Controls at the abattoir.

As such, an essential part of the meat hygiene training in Europe involves students undertaking placements within abattoirs. This practice remains vital to the educational experience of future veterinary professionals and is crucial to providing students with the practical skills necessary to satisfy the D1C. However, several issues have adversely affected the ability of students to gain such work placements, in particular the closure of many slaughterhouses across Europe and the difficulty, for biosecurity reasons, to give visitors access. For these reasons, a consortium of Veterinary Public Health experts was created, under the UNA Europa Seed Funding umbrella, to develop Virtual Slaughterhouse Simulator (VSS), an innovative demand-driven tool that enables students to explore a realistic abattoir work environment that allows them to safely 'perform' ante-mortem, post-mortem and auditing procedures to strengthen and enhance meat hygiene teaching.

Educational research results showed that the VSS is a valid tool for training veterinary students that can support traditional lectures and practical classes and can also be used to stimulate interactive problem-solving activities embedded in the relevant context. However, more research is advised to compare virtual and real experiences and assess students' long-term performance.

Keywords: VPH Education, Virtual Simulators, Meat Inspection

CONSERVATION PROGRAMME FOR NATIVE BREEDS: BRIEF SUMMARY ON ASPECTS TO CONSIDER WHEN ESTABLISHING IT IN THE SPANISH BREEDS "BERRENDO EN COLORADO" AND "BERRENDO EN NEGRO".

Miguel MORENO MILLÁN[1] and Evangelina RODERO SERRANO[2]

[1]MERAGEM Research Group, Department of Genetics, University of Córdoba, Spain.
[2]CORADES Research Group, Department of Animal Production, University of Córdoba, Spain.
Corresponding author, e-mail: ge1momim@uco.es

Introduction: In 2012 the breeding programme for the cattle breeds "Berrenda en Colorado" (BC) and "Berrenda en Negro" (BN) was established by the Spanish Ministry of Agriculture, Food and Environment, establishing the regulations on their Herd Books. Subsequently it had to be adapted in accordance with the "Animal Breeding Regulation" of the European Parliament and Council (EU2016/1012).
Aims: The general objective of these breeding plans is to ensure, due to their endangered status, the conservation of the two separate breeds of cows, maintaining their numbers, their purity and their genetic variability in their natural environment.
Material and Methods: To carry out the conservation plans, some aspects must to be consider. The first one is the genetic variability. In this sense, a total of 2300 animals of the BN and 3988 of the BC breeds were analysed. The second one is to fix phenotypic traits of both breeds, particularly the coat-colour in BN breed, identifying colour carriers using molecular genetic methodology. And, the last one, it must to be established selection strategies for the elimination of carriers of the chromosomal translocation rob(1;29) by means of cytogenetic analysis.
Results: A great genetic variability between both studied breeds in relation to parameters such as generation interval, pedigree integrity, consanguinity, and others such as parentage within the herd and between herds, was found. The fixation of coat-colour traits, which is characteristic of each breed (red or black), is other studied aspect because of the interest, especially for BN breed. In this breed, recessive *e* or E^+ alleles have been identified at the MC1R locus, which encodes the bovine melanocortin 1 receptor (MC1R), a 1751 bp gene located on chromosome 18. The MC1R locus plays a vital role in determining coat-colour by regulating the synthesis of red versus black pigment. As a decision, calves with brown (E^+E^+ or E^+e) or red (*ee*) spots are not accepted in the BN Herd-Books. The aim of the programme is to eliminate all carriers of E^De and the E^+ allele. Obviously after sufficient recovery of the populations. Finally, in relation to the presence of rob(1;29), the selective strategies for the reduction of its frequency should be carried out, whenever possible, in a progressive and controlled way, especially in the BC breed, due to the lower number of effectives and also to the fact that the population carrying rob(1;29) in this breed, curiously, presents a higher genetic variability, genetic variability that we are interested in maintaining due to the endangered situation in which it is found. In fact, the prevalence in a previous study in these breeds were 18% and reduced to 8% in BC, and in the BN, was from 47 to 11%.
Conclusion: In conclusion, when establishing a conservation programme for endangered breeds, the study of the genetic variability of the populations, the conservation of their own traits and the control of the chromosomal alterations with negative effects, are enough for their recovery.

Keywords: cytogenetics, genetic variability, native cattle.

SESSION 8: VETERINARY MEDICINE - FUNDAMENTAL AND PRECLINICAL SCIENCES

COMPARATIVE EVALUATION OF HEMERYTHRIN AND OVINE POLYMERIZED HEMOGLOBIN FOR VASCULAR AND SYSTEMIC EFFECTS IN A RAT HEMORRHAGIC SHOCK MODEL

Stefania-Madalina DANDEA[1*], Vlad-Alexandru TOMA[2,3], Alina HASAS[1],Maria Lehene[4], Ioana ROMAN[2], Cristian MOLDOVEANU[2,3], M. Muntean[5], Radu SILAGHI-DUMITRESCU[4], Bogdan SEVASTRE[1]

[1] Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania
[2]Department of Molecular Biology and Biotechnology, Faculty of Biology and Geology, Babes-Bolyai University, Cluj-Napoca, Romania
[3]Institute of Biological Research, Department of Biochemistry and Experimental Biology, Cluj-Napoca, Romania
[4]Babes-Bolyai University Faculty of Chemistry and Chemical Engineering, Cluj-Napoca, Romania,
[5]"Iuliu Hatieganu" University of Medicine and Pharmacy, Cluj-Napoca, Romania
*Corresponding author, e-mail: Stefania.dandea@usamvcluj.ro

Introduction: Hemoglobin-based oxygen carriers (HBOCs) have been developed to address limitations of traditional red blood cell (RBC) transfusions, such as oxygen delivery and storage issues. However, earlier generations faced significant clinical challenges, including cardiotoxicity and vascular inflammation.
Aims: This study compares the vascular and systemic effects of two HBOC formulations, PEGylated Hemerythrin (HrPEG) and Ovine Polymerized Hemoglobin (SpolyHb), in a rat hemorrhagic shock model.
Materials and Methods: Study groups received either HrPEG or SpolyHb following induced hemorrhagic shock, with assessments including serum cytokine levels (IL-1α, IL-1β, IL-10, IL-6, PGE2, TNF-α) and MMP-2 activity. Methods used included TEM, UV-Vis spectroscopy, ELISA, histological and immunohistochemical analyses, zymography, and statistical analysis.
Results: SpolyHb significantly decreased vascular inflammation and proinflammatory cytokines, demonstrating minimal endothelial damage and superior biocompatibility compared to HrPEG. The ultrastructural investigations revealed superficial endothelial damage only in the hemorrhage group, with no prominent detrimental effects observed with SpolyHb or HrPEG. However, HrPEG administration possibly led to humoral reactions in the liver due to endotoxins, significantly increasing HIF-1α expression and resulting in animal collapse. This suggests HrPEG's inefficacy in oxygen transport to hepatic tissues compared to hemoglobin.
Conclusion: SpolyHb exhibited superior efficacy and biocompatibility over HrPEG, providing better protection against vascular inflammation and maintaining endothelial integrity. These findings suggest SpolyHb as a more promising HBOC candidate for clinical applications in hemorrhagic shock treatment.

Keywords: Hemorrhagic Shock, Ovine Polymerized Hemoglobin, PEGylated Hemerythrin, Proinflammatory Cytokines, Vascular Inflammation, Oxygen Carriers

ACUTE TOXICOLOGICAL ASSESSMENT OF *BETULA PENDULA* ROTH, *BETULA PUBESCENS* EHRH. IN MURINE MODELS

Alina Diana HASAS[1], Daniela HANGANU[2], Timea Henrietta DEZSO (BAB)[2,3], Neli Kinga OLAH[3,4], Irina IELCIU[2], Raluca MARICA[1], Oana ROTAR[1], Teodora TANCIU[1], Bogdan SEVASTRE[1]*

[1] Faculty of Veterinary Medicine, University of Agricultural Science and Veterinary Medicine, Cluj-Napoca, Romania
[2] Faculty of Pharmacy, "Iuliu-Hatieganu" University of Medicine and Pharmacy, Cluj-Napoca, Romania
[3]PlantExtrakt Ltd., Rădaia, 407059 Cluj-Napoca, Romania
[4]Vasile Goldiş Western University of Arad, Faculty of Medicine, Department of Life Sciences, Arad, Romania
* Corresponding author, email: bogdan.sevastre@usamvcluj.ro

Introduction: Previous research has highlighted the medicinal potential of Betula species, particularly *Betula pendula* Roth and *Betula pubescens* Ehrh., for their anti-inflammatory and antioxidant properties. Despite their traditional use in herbal medicine, comprehensive toxicity studies remain limited. This study aims to fill this gap by evaluating the acute toxicity of these extracts in murine models to establish their safety profiles and potential health risks.
Aims: Evaluating acute effects, the research aims to establish safety profiles and identify any health risks associated with these botanical extracts. Findings will contribute to understanding the medicinal viability and safety of these species.
Materials and Methods: Leaf extracts were prepared at the Faculty of Pharmacy, UMF "Iuliu Haţieganu" Cluj-Napoca. Blood samples from mice were analyzed biochemically using a SCIL machine at USAMV Cluj-Napoca. Histopathological examinations were conducted by the Morphopathology Department at USAMV Cluj-Napoca.
Results: Clinical results remained unmodified throughout the study, with only one mouse exhibiting diarrhea, which was determined to be unrelated to the treatment. Biochemical analyses, necropsic and histopathological examinations revealed no significant changes across all experimental groups.
Conclusion: The results collectively suggest that *Betula pendula* Roth and *Betula pubescens* Ehrh. extracts are safe for use, at least within the parameters of this study. Further research may be warranted to explore their long-term effects and potential therapeutic benefits in different contexts.

Keywords: acute toxicity, *Betula spp.,* liver, kidneys, murine model.

NEW APROACH OF LABORATORY EXAM IN ACUTE PANCREATITIS IN DOG

Ioana-Mădălina MORARU[1*], Alexandra-Iulia DREANCĂ[1], Orșolya SARPATAKI[1], Bogdan SEVASTRE[1] and Ioan MARCUS[1]

[1] *Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania*
[*]Corresponding author, e-mail: ioana.moraru@usamvcluj.ro

Introduction: Since the early 2000s, cases of acute pancreatitis in dogs have become more prevalent as a result of the greater awareness of the condition, but especially due to the improvement of diagnostic exams.
Aims: The aim of this review focus on diagnostic progress of laboratory markers and performance of 1,2-o-dilauryl-rac-glycero3-glutaric acid-(6′-methylresorufin) ester (DGGR)-lipase activity assays in diagnosing canine pancreatitis. We also present additional hematological and biochemical markers that contribute to the understanding and the prognosis of this condition in dogs.
Materials and Methods: A literature search was conducted using tree databases (PubMed, Scopus, and Google Scholar). The search included articles published from the year 2000 to the present.
Results: Canine serum pancreatic lipase immunoreactivity (PLI) concentration is presently considered the most reliable clinicopathological test for diagnosing pancreatitis in dogs, however a recently introduced catalytic lipase activity assay, DGGR-lipase, exhibited greater results when compared to the previously used 1,2-DiG assay. The results are available in short time and at low price. Additionally, complete blood count and serum biochemistry profile provide important information regarding the general condition of the patient and, possibly, the prognosis. Recent studies have evaluated the reports of neutrophil-to-lymphocyte ratio (NLR), platelet-to-lymphocyte ratio (PLR), and other indicator for prediction of mortality and severity. Also, C-reactive protein (CRP) may be a good biomarker for monitoring hospitalized dogs with pancreatitis and a higher CRP/ALB ratio at presentation was associated with a higher risk of death before discharge.
Conclusion: No diagnostic modality is entirely reliable for diagnosing canine pancreatitis. Nonetheless, new laboratory markers show promising results. Establishing a more precise range of DGGR lipase will enable more efficient monitoring of patients with pancreatitis, reducing both time and costs.

Keywords: acute pancreatitis, DGGR-lipase, diagnosis

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THE FIRST REPORT OF PRESUMED CANINE DISTEMPER VIRUS INCLUSION BODIES IN THE DENTAL PULP OF A DOG

Raluca-Ioana NEDELEA[1*], Vasile RUS[1], Ioan MARCUS[1] and Adrian Florin GAL[1]

[1]*Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania*
[*]Corresponding author, e-mail: Raluca.Nedelea@dentovet.ro

Introduction: Canine distemper virus (CDV) infects terrestrial and aquatic mammals worldwide. Infected dogs may undergo a subclinical or rapidly progressive infection with subsequent exitus. Young puppies infected with CDV before the eruption of permanent dentition may show severe changes in the enamel, dentin or roots. Enamel hypoplasia may be an incidental finding in older dogs and is nearly pathognomonic of previous infection with CDV.
Aims: Our case reports a histological aspect of eosinophilic inclusion bodies in the canine dental pulp's cells.
Materials and Methods: A 7-month-old female spayed mixed-breed dog was presented for treatment of the right maxillary canine tooth (104) and four of the maxillary incisors' teeth (103, 102, 101, 201). 104 had the first circular groove at 3 mm apical to the tip of the crown. The incisors had the first groove at 2 mm apical to the tip of the crown. The dimensions of the grooves were one millimetre wide and one millimetre deep. The defects were present on the teeth' vestibular, mesial, palatal and distal faces. These macroscopical aspects plead for so-called "distemper teeth". The owners opted for dental extractions as a therapeutic approach.
Results: Surgical extractions were performed without any complications. The dental pulp of the canine tooth was fixed in NBF. It was then histologically processed by the paraffin embedding technique. Later, the sections were stained using Goldner's trichrome method and examined under an optical microscope. Multiple faintly eosinophilic intranuclear viral inclusions were identified mainly in the fibroblasts of the pulp core and occasionally in the odontoblasts and cells of the cell-rich zone. Random intranuclear viral inclusions with a size of 1-5µm could even be found in the endothelial cells of the blood vessels of the pulp core.
Conclusion: Our case report opens new perspectives regarding viral inclusions in the canine dental pulp's tissues. Morphological aspects of the dental crowns and the eosinophilic viral inclusions suggest the presence of Cdv in the dental pulp.

Keywords: dog, teeth, canine distemper virus, modified morphology

ANIMAL MODELS DESIGNED FOR EXPERIMENTAL OSTEOMYELITIS

Oana ROTAR[1*], Alexandra Iulia DREANCĂ[1], Klara MAGYARI[2], Alexandra FERARU[2] and Bogdan SEVASTRE[1]

[1] Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania
[2] Nanostructured Materials and Bio-Nano-Interfaces Center, Interdisciplinary Research Institute on Bio-Nano-Sciences, Babes-Bolyai University, Cluj-Napoca, Romania
[*]Corresponding author, e-mail: oana.rotar@student.usamvcluj.ro

Introduction: Osteomyelitis whether it is infectious or non-infectious, represents a debilitating bone disorder characterized by an inflammatory process involving the bone marrow, bone cortex, periosteum, and surrounding soft tissue, ultimately resulting in bone destruction.
Aims: The review aims to highlight the characteristics and corresponding clinical scenarios of different animal models assessing the severity of orthopaedic infection to provide some basic rationales for experimental selection.
Materials and Methods: PubMed and Google Scholar databases were searched systematically to find studies that investigate osteomyelitis in animal models. We included key terms such as "osteomyelitis" and "animal model". During the initial screening, the identified articles were reviewed by two authors independently and then any discrepancies were resolved by a third reviewer.
Results: The most commonly used animal models for osteomyelitis research are rats and mice. Rats offer several benefits because their bone structure is suitable for replicating fracture patterns and implanting foreign objects. Despite their small size, rats are a cost-effective and easily maintained animal model for experiments, offering numerous induction techniques to obtain relevant results and great similarity to clinical scenarios. Mice are commonly used to create bioluminescent models. Using this imaging technique makes it possible to assess infection in real time without sacrificing the animal, which reduces the number of animals required for an experiment. Despite their higher tolerance to surgical interventions, larger species are rarely used as models due to ethical and technical limitations.
Conclusion: Animal models provide valuable insights into specific aspects of infection, treatment efficacy and bone healing, each contributing uniquely to the understanding and managing osteomyelitis, for potential new treatment approaches in clinical cases.

Keywords: animal models, biomaterials, osteomyelitis

SESSION 9: VETERINARY MEDICINE - CLINICAL SCIENCES

THE USE OF A PEDICLE FLAP OF THE GREATER OMENTUM AS AN ADJUVANT IN CHRONIC NON-HEALING WOUNDS: A CASE REPORT

Tom ABLASSMAIER[1]*, Alina ZĂVOI[1], Sidonia GOG-BOGDAN[1], Nicuşor OROS[1], Liviu Oana[1] and Lucia BEL[1]

[1] *Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania*
*Corresponding author, e-mail: tom-adrian.ablassmaier@usamvcluj.ro

Introduction: The use of the greater omentum has become widely popular in veterinary surgery in the past decades. Due to its properties, being able to reduce local inflammation and edema, and promoting angiogenesis, this versatile organ is more and more used in surgery. The greater omentum or epiploon can be grasped and sutured to the location of choice either through the creation of a simple flap or even using a pedicle flap.
Aims: This case report describes the use of an omentum pedicle flap to cover a dehiscent wound on a cat's leg.
Material and Methods: At the time of the presentation the patient, a European shorthair feline was 3 years old, and had been transferred from another practice to the university clinic. After clinical and paraclinical examination, the cat underwent the first surgical procedure, to manage a tibial fracture. Two weeks after the procedure dehiscence was observed at the suture level. Due to the lack of tissue in this particular area, and clinical signs of local bacterial infection and to avoid amputation, an omentum pedicle flap was used. Under general anaesthesia, the cat was placed in right recumbency and the local fractured area was debrided. A small abdominal incision was performed and the omentum was exteriorized. A flap was created to enlarge the omentum up to 4 times and a tunnel was created subcutaneously up to the tibial defect. Once sutured in place the omentum was protected with colloid bandage that was changed every two weeks. 14 days after, the cat underwent general anaesthesia for the resection of the omentum from the abdominal orifice previously created and the tibial wound was closed using a flap.
Results and Discussion: Two years after surgery the cat is well and does not present any health issues or locomotive restrictions.
Conclusion: This case report describes the use of a pedicle omentum flap as the possible treatment of infected wounds, from areas with a lot of tension. In our case a complicated tibial fracture repair benefited from the properties of the greater omentum.

Keywords: Greater omentum, pedicle flap, tibial fracture

PRELIMINARY STUDY ON EVALUATION OF OCULOSCOPY USING THREE MIDRIATIC AGENTS IN RABBITS

Lucia BEL[1*], Marie DUBOIS[1], Stefana MURESAN[1], Cosmina DEJESCU[1], Carmen Maria TURCU[1], Iulia MELEGA[1], Alexandra CRET[1], Sidonia GOG-BOGDAN[1]

[1]*Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania*
[*]Corresponding author, e-mail: lucia.bel@usamvcluj.ro

Introduction: With ocular disease being common in rabbits, oculoscopy emerges as technique requiring minimal training that facilitates detailed visualization and magnification of ocular structures in this species, such as the periocular area and anterior eye segment, enhancing evaluation of the lens and retina. In other species, various mydriatic agents can be employed to improve visualization.
Aims: This study aims both to validate the easiness of use of oculoscopy and to compare the results of obtained using either eye instillation with 0.9% saline solution, 1% atropine, 0.5% tropicamide, or 10% phenylephrine eye drops on domestic rabbits.
Materials and Methods: Eighteen rabbits of different ages, sex and breeds were included in the study and were divided into 3 groups of 6 patients each. In the left eye, patients of group 1 received
0.5% tropicamide (Mydriaticum®, Théa), patients of group 2 received 1% Atropine (Alcon®) and patients of group 3 received 10% phenylephrine (Neosynephrine®, Faure). As negative control, saline solution (NaCl 0.9%) was instilled in the right eye of each patient. The procedure was conducted in two steps, firstly the pupil sizes were measured, then oculoscopy was performed. All animals were considered clinically healthy and were presented for elective surgery, with the owners consenting in writing to the oculoscopy procedure during the anesthetic protocol for the spay/castration.
Results: Different images were obtained during the oculoscopy examination. Regarding the mydriatic agents' use the results showed that the average pupil sizes were 5.8 ± 0.36 mm with saline solution, 9.83 ±0.71 mm with tropicamide, 9.40 ± 0.40 mm with atropine, and 10.07 ± 0.69 mm with phenylephrine. The oculoscopy images demonstrated the same degree of precision, with the ocular structures equally visible for each of the mydriatics used
Conclusion: Oculoscopy is a feasible method for evaluating the rabbit eye, with atropine, phenylephrine, and tropicamide being all efficient in their mydriatic effect. The procedure enables magnified visualization of the external and adnexal structures of the eye, including the eyelids, cilia, meibomian glands, conjunctiva, and corneal surface, and a new oculoscopy approach is described, involving two full 360-degree clockwise rotations with the tip of the telescope.

Keywords: rabbit, oculoscopy, midriatic agents

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NERVE STIMULATOR-ASSISTED BRACHIAL PLEXUS BLOCK IN RED-EARED SLIDERS (TRACHEMYS SCRIPTA ELEGANS) – A CASE REPORT

Alexandra CREȚ*, Maria-Carmen TURCU, Iulia MELEGA, Lucia BEL, Cosmin PEŞTEAN, and Mihai CENARIU

Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania
*Corresponding author, e-mail: alexandra.cret@usamvcluj.ro

Introduction: Forelimb injuries are common among reptiles, and wound debridement or limb amputation are interventions often performed in clinical practice. Considering the slow metabolism of turtles, the goal is to provide analgesia through loco-regional anesthesia methods, thus reducing the overall need for general anesthetics.
Aims: Previous studies have described brachial plexus blocking techniques following anatomical landmarks and blind injection, but these methods yielded unsatisfactory results. The nerve stimulator block method could improve the effectiveness of the nerve block while reducing the risk of complications and the amount of general anesthetic required.
Materials and Methods: A red-eared slider with an open fracture scheduled for digit amputation underwent general anesthesia, the forelimb was aseptically prepared, and the skin electrode was placed distally. The insulated needle was inserted following the anatomical landmarks described by Alissa B. Mones et al., in 2021. After confirming the right position of the needle Bupivacaine 0,5% (1mg/kg) was injected.
Results: As the needle approached the target nerves, protraction of the forelimb was noted, indicating the optimal site for anesthetic injection. No signs of nociception stimulus were present throughout the intervention and recovery was uneventful.
Conclusion: This case report emphasises the use of the nerve locator to enhance the efficacy of the brachial plexus block during surgical procedures involving the distal part of the forelimb in red-eared sliders. However, more studies are needed to confirm the block`s efficacy in the absence of any analgesic molecules.

Keywords: amputation, brachial plexus, neurostimulator, red-ear slider

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MOLECULAR GENETIC TECHNIQUES USED IN THE DIAGNOSIS OF *ENCEPHALITOZOON CUNICULI* IN DOMESTIC RABBITS (*ORYCTOLAGUS CUNICULUS*)

Anca-Alexandra DOBOȘI[1]*, Anamaria Ioana PAȘTIU[1] and Dana Liana PUSTA[1]

[1] *Department of Animal Genetics and Hereditary Diseases, Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine, Cluj-Napoca, Romania*
*Corresponding author, e-mail: anca.dobosi@student.usamvcluj.ro

Introduction: *Encephalitozoon cuniculi* is a microsporidian, domestic rabbits being the main host. The disease can be acute, with neurological, renal and ocular symptoms, or subclinical. Treatment options are usually with unrewarding results, but these include fenbendazole, anti-inflammatory and antibiotic medication. Diagnosis and prevention of encephalitozoonosis remain the main methods for disease control.
Aims: The aim of this study is to test tissues coming from pet and farm rabbit populations by DNA detection of *E. cuniculi* using different molecular genetic techniques.
Materials and Methods: A total of 23 rabbits took part in the PCR analysis, from which a total of 90 tissues were sampled. DNA extraction was carried out using the ReliaPrep gDNA Tissue Miniprep System Kit (Promega, USA), followed by nested PCR (n=11) and qPCR (n=90) of the resulted products. Lastly, results were read by gel electrophoresis 1.5% and statistically analyzed using the EpiInfo 2000 software (CDC, Atlanta, GA, USA).
Results: A total prevalence of 47.83% (11/23) was obtained through qPCR, with statistically significant differences in relation to the animal's sex, breeding system and vaccination status. In regard to organ prevalence, both brain and kidney turned out to have the highest percentages of 26.09% (6/23) positivity, followed by urinary bladder with 21.43% (3/14) and eye lens with 13.04% (3/23).
Conclusion: The relatively high prevalence of this study offers us a warning sign regarding the pathogen's spread and its zoonotic potential. However, limitations of this study include the small number of individuals tested and the subjective aspect of tissue sampling. Further studies on larger rabbit populations and with optimized PCR protocols are required.

Keywords: domestic rabbits, encephalitozoonosis, *Encephalitozoon cuniculi*, molecular genetic

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STARTING FROM SCRATCH AND SETTING UP THE DRUG PREPARATION LABORATORY MEANS QUALITY AND INDEPENDENCE

Ionuț Răzvan DOBRE[1]*, Iuliana IONAȘCU[1] and Adriana-Daniela VLĂGIOIU[2]

[1] *Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine of Bucharest, Romania*
[2] *VET LINE –Veterinary Teaching Hospital*
*Corresponding author, e-mail: drrazvandobre@gmail.com

Introduction: Personalized medicines, also known as precision medicines, are tailored medical treatments designed to cater to individual differences in patients' environments, and lifestyles, extending the range of mass-produced medication.
The future of medicine is personalized. Pharmaceutical compounding allows doctors to create medication that satisfies the individual needs of the patient (Cullus, 2015).
Personalized medicines emerged due to limitations of traditional medicine, technological innovations, increased understanding of disease mechanisms, demand for improved outcomes, and economic considerations (Hood and Price, 2023).
Aims: The aim of our paper is to present the determination of our team to create the drug preparation laboratory. We made this possible from the need to provide the best treatments to our patients that fulfil all the doctors' requirements in the Veterinary Teaching Hospital.
Materials and Methods: In our drug preparation laboratory, we have prepared pharmaceutical forms that are no longer available on the market; we have changed the pharmaceutical form of some drugs for an appropriate administration; we have divided capsules into the correct dose according to the specific body weight of the animals.
Results: We moved from solution to solutions, we created individual solutions because individuals are not the same, they are different. We respect differences and personalized the treatments. Personalized medicine in our veterinary practice will revolutionise animal healthcare by providing more precise, effective, and individualized care, improving the health and well-being of the pets.
Conclusion: Medicines that work for most animals may not work for the animal that we treat, and for that reason we offer safe personalized pharmaceutical solutions, letting quality define us.
We are aware of the new challenges, and we are sure that we will overcome them because we will use our creativity to develop innovative solutions, making an impact for today and tomorrow, and creating a better future.

Keywords: compounding, drugs, laboratory, personalized, pharmaceutical

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PREVALENCE OF ECHINOCOCCOSIS IN ANIMALS AND HUMANS IN ROMANIA (2007-2021): A SYSTEMATIC REVIEW AND META-ANALYSIS

Adriana GYÖRKE[1*], Edina-Lenke HAIDU[1] and Viorica MIRCEAN[1]

[1] *Faculty of Veterinary Medicine,University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania*
[*]Corresponding author, e-mail: adriana.gyorke@usamvcluj.ro

Introduction: Echinococcosis is a zoonotic disease caused by *Echinococcus granulosus.* The adult tapeworm develops in the small intestine of domestic and wild carnivores which are the definitive hosts. The larval form develops as a cyst in the parenchymatous organs (mainly in the liver and lungs) of herbivores and omnivores, including humans. Parasitic zoonoses cause a considerable global burden of ill health in humans and produce a substantial financial burden on livestock (Torgerson and Macphersonb, 2011). Globally, *Echinococcus granulosus* ranks second in the list of food-borne parasites (FAO/WHO, 2014), whereas in Eastern Europe it has been ranked first (Bouwknegt et al., 2018). Romania is a highly endemic country for echinococcosis both in animals and humans.
Aims: Considering the widespread of echinococcosis in our country and that the last review was published in 2010 (period 1862-2007), we aimed to review the epidemiological situation of echinococcosis after 2007.
Materials and Methods: A systematic search was performed on online databases (Pubmed, Google Scholar), and archives of the scientific journals published by universities of agricultural sciences and veterinary medicine from Romania (București, Cluj-Napoca, Iași, Timișoara). The official datasets from the online archive of the EFSA Journal were also included in this study. All datasets were statistically analyzed, to indicate the frequency and pooled prevalence of echinococcosis in animals and humans in our country for the 2007-2021 period.
Results: The pooled prevalence of echinococcosis in Romania in the intermediate hosts was 30.6%. Rodents had the highest pooled prevalence (76.5%), followed by sheep (51.3%), and cattle (39.8%). The lowest pooled prevalence was identified in wild boars (5.2%), followed by pigs (5.4%), deers (9.5%), and horses (21.3%). In humans, the pooled prevalence was 0.8%. The highest prevalence has been identified in central Romania (44.6%), followed by the southwest region (42.6%). The lowest prevalence was identified in the western Romania (5.6%). *Echinococcus granulosus* genotype G1 was the most frequently identified (deer 100%, wild boars 53.6%, sheep 51.6%, cattle 42.3%).
Conclusion: Overall, even though the prevalence of echinococcosis decreased compared with the former reviewed period, it remains high highlighting the need for better interventions.

Keywords: animals, *Echinococcus*, humans, zoonosis.

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INFLUENCE OF *CRYPTOSPORIDIUM* SPP. INFECTION DIVERSITY ON WEIGHT GAIN IN LAMBS

Mariana LOURO[1,2*], Zita RUANO[3,4], João LOZANO[1,2], Ioana MITREA[5], Isabel PEREIRA DA FONSECA[1,2] and Jacinto GOMES[1,2,6]

[1]CIISA – Centre for Interdisciplinary Research in Animal Health, Faculty of Veterinary Medicine, University of Lisbon, Avenida da Universidade Técnica, 1300-477, Lisbon Portugal
[2]Associate Laboratory for Animal and Veterinary Sciences (AL4AnimalS), Portugal
[3]Veterinary and Animal Research Center (CECAV), University of Trás-os-Montes e Alto Douro, Portugal
[4]Center for Research and Development in Agrifood Systems and Sustainability (CISAS), Escola Superior Agrária, Instituto Politécnico de Viana do Castelo, Portugal
[5]Department of Parasitology and Parasitic Diseases, University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca, Calea Mănăștur 3-5, 400372, Cluj-Napoca, Romania
[6] Elvas School of Biosciences, Polytechnic Institute of Portalegre, Portalegre, Portugal
[*]Corresponding author, e-mail: marianacl@fmv.ulisboa.pt

Introduction: *Cryptosporidium* spp. infection in lambs can impact weight gain, leading to economic losses and environmental contamination. Detecting and understanding the diversity of *Cryptosporidium* species is crucial for assessing its impact on lamb growth.
Aims: This analysis emphasizes the relationship between *Cryptosporidium* spp. diversity and lamb weight gain, highlighting the influence of other animal cohabitants on this process.
Materials and Methods: 91 fecal samples were collected from 'Churra Galega Mirandesa' lambs in Portugal. Data on weight gain, age and presence of animal cohabitants were recorded. The samples were used for DNA extraction and detection of *Cryptosporidium* spp.. Positive samples were sequenced to identify *Cryptosporidium* species and *C. parvum* genotypes.
Results: 47 samples (51.6%) were positive for *Cryptosporidium* spp. Five *Cryptosporidium* species were identified by sequencing: *C. parvum* (n=29), *C. bovis* (n=13), *C. ryanae* (n=1), *C. ubiquitum* (n=1) and *C. xiaoi* (n=1). Two subtypes of *C. parvum* were detected: IIa A15G2R1 and IId A21G1. Lambs infected with *Cryptosporidium* had significantly lower weight gain ($p<0.001$) than lambs without *Cryptosporidium*. *C. bovis* was only found in lambs that cohabited with bovines. Lambs also had significantly lower weight gain when cohabiting with bovines ($p<0.001$) or other animals ($p=0.037$).
Conclusion: The presence of *Cryptosporidium* spp. at an early age negatively affects the weight gain of lambs. The results suggest a high *Cryptosporidium* species diversity, probably related to the presence of other cohabitants, which negatively affect weight gain and potentiate environmental contamination.

Keywords: *Cryptosporidium* spp., genotypes, lambs, molecular characterization, PCR

ARE PHYTOTHERAPEUTICS THE FUTURE IN ATOPIC DERMATITIS? – A BIBLIOGRAPHIC REVIEW OF CANINE ATOPIC DERMATITIS AND ATOPIC DERMATITIS MODELS

Lorena-Eliza MASTAN[1], Bogdan SEVASTRE[1*] and Viorica MIRCEAN[1]

[1] *Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania*
*Corresponding author, e-mail: bogdan.sevastre@usamvcluj.ro

Introduction: Atopic dermatitis is a prevalent inflammatory and itchy allergic skin condition affecting both humans and dogs, as well as other species such as cats, horses, and mice. The underlying causes of atopic dermatitis are multiple and complex. Although a cure for this disease, including its counterpart in canines, is currently unavailable, treatment strategies are multifaceted and primarily aim to manage itching, decrease inflammation, avoid flare factors, as well as maintain a balanced skin barrier and treat secondary skin infections. Due to the striking clinical, pathological, and histological similarities of atopic dermatitis across species, dogs and mice have been utilized as models for studying human atopic dermatitis. Considering the rise in methicillin-resistant and multidrug-resistant bacterial skin infections caused by *Staphylococcus pseudintermedius* in canine patients, managing secondary skin infetions in canine atopic dermatitis will become increasingly challenging. For centuries, medicinal plants have been traditionally utilized for treating skin diseases and wound care, both in humans and dogs.
Aims: Reviewing current literature on atopic dermatitis, canine atopic dermatitis, translational models of atopic dermatitis and phytotherapeutics in atopic dermatitis contributes to understanding the current state of knowledge and identify gaps in the literature. This bibliographic study serves as support for further research on animal models of atopic dermatitis and effects of herbal medicine on these models.
Materials and Methods: Citation databases were used to find and review relevant academic papers, articles, books, on atopic dermatitis, canine atopic dermatitis, translational models of atopic dermatitis and phytotherapeutics in atopic dermatitis.
Results: The review underscores the current relevance of utilizing animal models to study atopic dermatitis, and suggests that medicinal plants should be considered as future promising therapeutic options for managing skin disorders.
Conclusion: The present review suggests that atopic dermatitis is a prevalent, multifaceted chronic disease in multiple species and developing animal models for testing phytotherapeutics could advance our understanding of the disease's pathophysiology and establish complementary therapeutic approaches.

Keywords: Atopic Dermatitis, Canine Atopic Dermatitis, Phytotherapeutics, Translational Models

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NOT ALL UTERINE PATHOLOGIES ARE ADENOCARCINOMAS: A CASE SERIES OF FOUR PET RABBITS (*ORYCTOLAGUS CUNICULI*)

Maria-Carmen TURCU*, Iulia MELEGA, Alexandra CREȚ, Cosmina DEJESCU, Georgiana LUPU, Miruna MATEI, Felix LUCACI, Sorin MÎRZA, Andrada NEGOESCU, Romelia POP, Flaviu TABARAN, Lucia BEL

Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania
*Corresponding author, e-mail: maria-carmen.turcu@usamvcluj.ro

Introduction: Uterine adenocarcinomas are the most common neoplasms in female rabbits, with studies showing that up to 80% of unspayed does over five years old develop this malignancy. However, other uterine pathologies warrant further investigation.
This paper **aims** to explore diverse uterine pathologies in pet rabbits, emphasizing the critical role of regular veterinary examinations and spaying as preventive measures.
Materials and methods: In 2024 four rabbits underwent ovariohisterohemivaginectomy. Rabbit 1 (6 mo Angora) underwent a preventive spay revealing a unicornuate uterus. Rabbits 2 (4 yo Lop) and 3 (4 yo Lionhead) presented with hydrometra confirmed by ultrasound and x-ray. Rabbit 4 (3 yo Rex) presented with GI stasis, with ultrasound identifying a mass on the right uterine horn. All rabbits are currently alive.
Results and discussions: Histopathology revealed normal morphology of unicornuate uterus in Rabbit 1, cystic hyperplasia of endometrium in Rabbit 2, tubulopapillary adenocarcinoma in Rabbit 3, and endometrial polyp in Rabbit 4. Uterine pathologies in rabbits encompass adenocarcinoma, benign conditions (cystic hyperplasia, polyps), inflammatory disorders (hydrometra, pyometra, endometritis), and less common issues (fibroids, torsion, prolapse).
Conclusions and recommendations: While uterine adenocarcinomas are a major concern in older, unspayed female rabbits, other uterine pathologies also pose significant health risks. By expanding the focus beyond adenocarcinomas, veterinarians and owners can improve rabbits' reproductive health through early detection and preventive spaying, enhancing their overall quality of life and longevity.

Keywords: ovariohisterohemivaginectomy, rabbit, uterine pathologies

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SESSION 10: GEODESY, FORESTRY AND APPLIED EXACT SCIENCES

SALMONIDS PRODUCTIVITY ESTIMATION ON SOMEȘUL CALD RIVER, UPSTREAM OF IC PONOR, CLUJ COUNTY, ROMANIA

Horia-Dan VLASIN[1*], Aldo-Bogdan CSAKI[1] and Steluța-Maria SÎNGEORZAN[1]

[1]*Faculty of Forestry and Cadastre, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania*
*Corresponding author, e-mail: horia.vlasin@usamvcluj.ro

Introduction: Someșul Cald river is located in the Apuseni Mountains, at the south of the Vlădeasa massif, and is part of the fishing fund no. 5, Someșul Cald Superior. The salmonids fauna of Someșul Cald river is represented by indigenous trout (brown trout) (*Salmo trutta*) and grayling (*Thymallus thymallus*) (Ciobanu, 2018).
Aims: The purpose of the present study is to determine the salmonids productivity in the sector of Someșul Cald river, upstream Ic Ponor, Cluj county, Romania.
Materials and Methods: The researches have been conducted on a sector of 4.0 km. Estimating salmonids productivity requires determining the biogenic capacity and other parameters of the river (bed width, habitat factor). The determination of the biogenic capacity was established according to the method elaborated by The National Institute for Research and Development in Forestry „Marin Drăcea", Romania, analysing the abiotic, biotic and anthropic factors which influence the salmonids production (Cristea, 2004).
Results: After analysing the field data, we established a 68 average score for the entire sector, thus, its biogenic capacity being VII, a class belonging to the category of medium-rich waters. The established salmonids production is 18.7 kg/km of river.
Conclusion: The river bed construction works (floored waterfalls, anchored trees placement, small lakes for fry, juvenile trout population), salmonids fry introduction and river protection represent premises for the increase and amelioration of salmonids productivity, of the ecosystem they belong to, which, in time, determine a substantial economic contribution by selling fishing permits and also by developing zonal tourism, by promoting nature and its long-lasting resources management.

Keywords: salmonids production, *Salmo trutta*, piscicultural stock, fishing, river bed construction works.

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THE EFFECT OF ENVIRONMENTAL CONDITIONS ON THE GROWTH AND PRODUCTIVITY OF LINGONBERRY

Carla M. APARASCHIVE[1], Alina M. TRUTA[1], Irina M. MORAR[1] and Adriana F. SESTRAS[1]*

[1] *Faculty of Forestry and Cadastre, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania*
*Corresponding author, e-mail: adriana.sestras@usamvcluj.ro

Introduction: Environmental conditions are critical in shaping the growth and productivity of wild lingonberry (*Vaccinium vitis-idaea*), a species that grows wild in various habitats, ranging from lowland areas to mountainous regions. Soil acidity, climate, light availability, and water levels significantly influence the health and yield of this plant. Understanding these environmental factors is essential for conserving wild lingonberry and maintaining its productivity. Favorable conditions enhance growth and fruiting, while adverse conditions can reduce vigor and yields (Gustavsson, 2001; Kowalska, 2021).
Aims: This review aims to explore how various environmental conditions affect the growth and productivity of lingonberry across different habitats. The study seeks to identify key factors such as soil, climate, light availability, and water levels that influence wild lingonberry populations, with the goal of providing insights to aid in the species' conservation and sustained productivity.
Materials and Methods: This review was conducted by examining existing literature on the environmental requirements and natural growth patterns of *Vaccinium vitis-idaea*. Relevant studies, including experimental research and field observations, were investigated to determine the impact of the environmental factors mentioned before.
Results: The review highlighted that light affects the synthesis of flavonoids and anthocyanins, with variations in solar radiation and photoperiod influencing fruit development. Increased altitude was found to boost polyphenol and vitamin C accumulation but reduce plant height and pollinator activity. Forest type and soil characteristics influence plant distribution and density, with cambisols and podzols being preferred. Winter temperatures and precipitation conditions directly affect flowering success and fruit production.
Conclusion: The review concludes that the analysed factors significantly influence anthocyanin synthesis, nutrient accumulation, and the success of flowering and fruiting, which are essential for maintaining the health and productivity of wild lingonberry populations.

Keywords: environmental factors, growth, lingonberry, yield

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UAV TECHNIQUES IN THE EARLY SIGNALING OF DISEASES IN FOREST NURSERIES

Mircea MOLDOVAN[1], Ioan TĂUT[2*] and Florin REBREAN[2]

[1] Section of Cluj-Napoca, Station of Bistrița, "Marin Drăcea" National Institute for Research and Development in Forestry, Romania
[2] Faculty of Forestry and Cadastre, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania
[*]Corresponding author, e-mail: ioan.taut@usamvcluj.ro

Introduction: UAV technology has evolved over time, currently being implemented in most fields that involve the use of photogrammetry, especially where data is needed at short time intervals (Duarte et all., 2022). As in other fields involving the use of photogrammetry, in forestry this technology has been implemented to detect various diseases and pests within forests by analyzing the various spectrums reflected by affected plant parts (Sun et al., 2021).
Aims: In the present study, we identified the solutions for early signaling of diseases present in forestry crops from nurseries by performing repeated flights, which would capture the health status of the seedlings.
Materials and Methods: The collection of photogrammetric data was done with a DJI Phantom 4 UAV equipped with a multispectral camera, in the Voivodeni nursery in the oak culture of the 3rd year, sessile oak and cherry in the 1st year, and in the Valea Iușului nursery in the sessile culture of the 1st year and the year 2.
Results: Following the testing of various flight parameters, such as altitude, speed, and overlay of frontal and side photos, images were obtained through which the occurrence of diseases was detected early, later being confirmed from the ground with the monitoring of the occurrence of infections.
Conclusion: In the present study, UAV technology was tested in order to identify diseases in forest crops, establishing the main flight parameters in the conditions of forest nurseries.

Keywords: UAV, diseases, early detection

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COMPARATIVE ANALYSIS ON ECO-PRODUCTIVE TECHNOLOGIES FOR MODERN TIMBER HARVESTING IN CONTRAST WITH CLASSICAL ONES

Steluța-Maria SÎNGEORZAN[1], Ilie COVRIG[1]*, Mădălina COVRIG[2], Marius SÂNGEORZAN[1] and Horia-Dan VLASIN[1]

[1] *Faculty of Forestry and Cadastre, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, România*
[2]*Faculty of Silviculture and Forest EngineeringTransilvanya University of Brașov, Romania*
*Corresponding author, e-mail: ilie.covrig@usamvcluj.ro

Introduction: In logging, innovative equipment has been developed to reduce physical effort and increase harvesting efficiency. The diversity of techniques used makes it essential to choose eco-conscious, efficient methods with minimal impact on the environment.
Aims: The purpose of this work is to carry out a comparative analysis between modern eco-productive technologies and classic wood harvesting technologies. The paper aims to highlight the advantages and disadvantages of each method, as well as to analyze the environmental impact and efficiency of the harvesting and collection processes.
Materials and Methods: The present work has an applicative character, it is based on real data taken from the Forest District of Izvorul Someșului Mare, in which the analysis of the collection variants and the technical-economic project regarding the exploitation of the wood mass in the parquet are presented, depending on the characteristics of the working conditions in the parquet. The analysis was carried out in the felling area 2027 Ciungi, Forest District of Izvorul Someșului Mare, Bistrița-Năsăud County, consisting of planning units 109A, 109B and 110A. In the case of modern technologies, the KMS Konrad mobile pillar funicular and Woodliner Konrad self-propelled trolley were used, Ponsse HS-15 and Ponsse Bison S-15 equipment, and for the classic ones, the skidding technology and the 2012 articulated forestry tractor were used.
Results: From the results obtained in the work, it appears that these modern machines do not have very high operating costs compared to classic technologies, the difference in costs being very small, but which is covered by the shorter operating period, and if the negative impact on the environment is also balanced, it can be said that these machines are much more profitable.
Conclusion: The results of the study underline the need to adopt innovative methods that reduce environmental damage and ensure a sustainable use of wood resources.

Keywords: eco-productive, innovation, logging, modern technologies.

EVALUATION OF GEDI/ICESAT-2 SATELLITE LIDAR DATASETS POTENTIAL FOR GROUND SURFACE MODELLING

Mihnea CĂȚEANU[1]* and Sorina-Mihaela MICLESCU[2]

[1] *Faculty of Silviculture and Forest Engineering, Transilvania University of Brașov, Romania*
[2] *Faculty of Geography, University of Bucharest, Romania*
*Corresponding author, e-mail: cateanu.mihnea@unitbv.ro

Introduction: An emerging mapping technology called *Light Detection and Ranging* (LiDAR) has led to a paradigm shift in earth sciences, as it can provide the data needed for high-accuracy, high-resolution models of the ground surface. So far, LiDAR sensors have been developed for terrestrial, airborne or satellite platforms, each with their inherent advantages and weaknesses. Two LiDAR satellite programs are currently in operation: a photon-counting laser altimeter mounted on the *Ice, Cloud and Land Elevation Satellite-2* (ICESat-2) and a full-waveform sensor part of the mission *Global Ecosystem Dynamics Investigation* (GEDI). They differ significantly in terms of employed technology, processing carried out to estimate elevation, sampling strategy, coverage, or accuracy.
Aims: The purpose of this study is the evaluate GEDI/ICESat-2 ground data for the generation of medium-resolution DTMs, in a study area characterised by complex relief and mainly covered by forest vegetation. The accuracy of the obtained DTMs, the data density of the initial products and the limitations of the two technologies have been considered.
Materials and Methods: GEDI L2A granules and ICESat-2 ATL03/ATL08 products collected between 2019-2023 over the study area have been downloaded and ground data extracted from them. For GEDI, the two flags provided in the datasets ("*degraded*" and "*quality*") have been used to filter out waveforms of uncertain ground estimation. The resulting data was then used to interpolate DTMs of the study area (approx. 246 km^2) at a 1-meter resolution. Datasets were then compared against a reference DTM obtained from Airborne Laser Scanning (ALS).
Results: Both datasources are affected by outlier values which must be filtered out, at least in part, to improve the accuracy of obtained DTMs. Overall, we find that ICESat-2 offers better accuracy, while GEDI has a much better spatial distribution of observations.
Conclusion: GEDI and ICESat-2, while not without limitations, enable terrain sampling at unprecedented near-global coverage and adequate accuracy.

Keywords: GEDI, Ground surface modelling, ICESat-2, LiDAR Remote Sensing

IMPLEMENTATION IN ARCGIS ONLINE OF A WATER NETWORK CONNECTION IN THE COMMUNE OF MITOCU DRAGOMIRNEI, SUCEAVA COUNTY

Cristian MĂLINAȘ[1], Ioana POP[1], Tudor SĂLĂGEAN[1], Anamaria MĂLINAȘ[1], Mircea NAP[1], Silvia CHIOREAN[1], Mihaela B. CRAȘOVAN[1] and Florica MATEI[1]*

[1] *Faculty of Forestry and Cadastre, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, România*
*Corresponding author, e-mail: faldea@usamvcluj.ro

Introduction: A well-defined trend in the development and application of information technology in the realities of the 21st century is represented by information systems. Daily life has become deeply dependent on these systems. Geographic Information Systems (GIS) are part of the larger family of information systems, with the particularity of using spatially referenced data. Thus, databases, which form the foundation of any information system, are enriched with geographic references, meaning the mapping of represented realities.
Aims: This paper presents the implementation of a Geographic Information System (GIS) for planning and managing the water network in Mitocu Dragomirnei Commune, Suceava County. Given the increasing need for access to quality potable water, the use of a GIS offers significant benefits in terms of planning efficiency and precision of infrastructure.
Materials and Methods: To be able to create and analyze the water network, an initial topographic survey was necessary. This topographic survey was carried out using the AutoCAD program. After importing the data from AutoCAD, a database was created in ArcGIS Pro, and the necessary layers were configured to create the thematic map. The work includes the collection and processing of geographic data, integrating them into a GIS database, and performing spatial analyses to model various scenarios of new the water network.
Results: The results are presented in the form of thematic maps and comparative analyses, providing optimal solutions for the development of potable water infrastructure in the commune.
Conclusion: The implementation of a Geographic Information System (GIS) for managing the water network in Mitocu Dragomirnei commune has demonstrated multiple advantages in terms of efficiency, durability, and the ability to respond quickly to issues that arise in the network. By using ArcGIS Pro and the Water Distribution package, optimal management of the water infrastructure has been ensured, thus facilitating the sustainable and enduring development of the commune..

Keywords: ArcGIS Pro, Online, Utility Map, Water Network,

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FOR THE FIRST TIME IN THE USAMV-CN CAMPUS? A WEB APPLICATION THAT ASSIST IN THE IDENTIFICATION OF CLASSROOMS

Florica MATEI[1], Ioana POP[1], Tudor SĂLĂGEAN[1], Jutka DEAK[1], Elemer Emanuel ŞUBA[1], Lucia Adina TRUŢĂ[1], Cristian BUKOS[1], Cristian MĂLINAŞ[1]*

[1] *Faculty of Forestry and Cadastre, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, România*
*Corresponding author, e-mail: cristian.malinas@usamvcluj.ro

Introduction: The campus of the University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca (UASVM-CN) is known as a green oasis in a busy town. The campus area is ≈26 ha and finding certain locations here can be challenging for new students or visitors. Overall, the evolution of technologies, smartphones, tablets, facilitate new software approaches to classical situations such as finding a classroom in a huge campus (Ryzhok *et al.*, 2023).
Aims: The main aim of our research is to design and deploy a web application that assists visitors in finding a classroom in the campus. Based on its name, the user will identify the building and floor of the classroom, and it will be marked on the surveying plan. Another aim is the analysis of spatial geodatabase that allows an efficient classroom management.
Materials and Methods: The design and development of the web application are based on ArcGIS online, i.e. a GIS that allows the transformation of spatial data into web maps and web application. The geospatial data are conveyed into thematic maps of the footprints for 2 of the buildings in the campus: ICHAT and Horticulture. The geodatabase used for these buildings was enriched with specific data needed for classrooms' characterisation. The next step is to create the web map that will be used for the deployment of the web application.
Results: Web application allows to fix the user's position on the campus map and, using the search options, the map will zoom to the building where the classroom is located, emphasizing its position on the surveying plan.
Conclusion: ArcGIS online facilitated the design of a web application that allows anyone interested to find a classroom in the campus. Such capabilities of web apps create a bridge between research results and end users.

Keywords: ArcGIS online, thematic maps, web application

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TOPO-BATHYMETRIC ANALYSIS FOR THE IDENTIFICATION OF OPTIMAL SECTIONS FOR THE DEPLOYMENT OF FLOATING STRUCTURES ON THE SOMEȘUL MARE RIVER

Adela – Maria NEAG[1], Cătălin-Ștefănel SABOU[1], Simion BRUMĂ[1], Florica MATEI[1], Tudor SĂLĂGEAN[1]

[1]*Faculty of Forestry and Land Survey, University of Life Science and Veterinary Medicine Cluj, Cluj-Napoca*
[*]Corresponding author, e-mail: adelaneag2000@gmail.com

Introduction: *River pollution is* one of the most important problems over the past years, identified in Romania during the analyses of environment protection and water pollution. *In Development of river trash collector system (April 2020)*, one of the first perspective it revolves around the issue of threatens that resulted from current analyses where it has been estimated that there are over 5 trillion pieces of plastic floating in the world`s oceans and rivers. On the other hand, moving to the North-West side of Romania, upstream of the city of Beclean, the Someșul Mare River traverses' numerous settlements, consequently undergoing and accumulating an increasing amount of waste.
Aims: The current research involves the implementation of an analysis of floating structures to identify optimal sections for biodiversity conservation and water management.
Materials and Methods: To gather the required data for this project, topographic and bathymetric measurements were conducted, capturing details of the area to create 3D models or digital elevation models.
Results: Single Beam Bathymetric Data were utilized to generate three-dimensional metrics for riverbed characterization, while terrain data were collected using a UAV LiDAR sensor.
Conclusion: In thhasesent research work, is demonstrated that through the technologies used and the topo-bathymetric methods, can be achieved important solutions for the future of river development that have been defined.

Keywords: Bathymetry, float systems, pollution, topography.

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NON-CHEMICAL METHODS FOR IMPROVING LARCH (*LARIX DECIDUA)* SEED GERMINATION

Petru TRUTA[1,3], Irina M. MORAR[1], Catalina DAN[2], Iulia ARION[1], Roxana L. STOIAN-DOD[2], Carla APARASCHIVE[1], Adriana F. SESTRAS[1], Alina M. TRUTA[1]* and Ioan-David LEONTIN[3]

[1] *Faculty of Forestry and Cadastre, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania*
[2] *Faculty of Horticulture and Business in Rural Development, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, România*
[3] *Faculty of Physics, Babes-Bolyai University Cluj-Napoca, Romania*
*Corresponding author, e-mail: alina.truta@usamvcluj.ro

Introduction: Larch (*Larix decidua*) is one of the most valuable conifer species widely used in forestry due to its rapid growth and high-quality timber. Enhancing seed germination is fundamental for improving reforestation programs (Rehfeldt and Jaquish, 2010; Vilcan *et al*., 2011).
Aims: The current study aimed to analyze the effects of electric field treatments on *Larix decidua* seed germination.
Materials and Methods: The effect of electric fields (EF) on seed germination was studied at the Biophysical Laboratory of the University of Agricultural Sciences and Veterinary Medicine, Cluj-Napoca, Romania. The EF generator, featuring adjustable fittings and a variable voltage source, was used to expose seed lots to electric fields. The study examined three voltage levels (10V, 30V, and 50V) and three exposure durations (15 min, 30 min, and 50 min), including a control group.
Results: Exposure to electric fields showed significantly improve on larch seed germination rates, particularly when optimal voltage and exposure time were used. The current study illustrated that certain combinations of voltage and exposure time yielded the highest germination rates compared to control conditions. This suggests that EF treatments can be a beneficial method for enhancing seed germination of larch species.
Conclusion: These results provide a general overview of the potential effects of electric field treatments on seed germination and seedling development. This could have practical applications in areas such as reforestation programs.

Keywords: electric field, germination, seeds, treatments

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INFLUENCE OF ABIOTIC STRESS FACTORS ON THE GERMINATION OF SILVER FIR SEEDS FROM DIFFERENT ROMANIAN PROVENANCES

Irina M. MORAR[1], Alina M. TRUTA[1], Catalina DAN[2], Roxana L. STOIAN-DOD[2], Iulia ARION[1], Carla APARASCHIVE[1], Adriana F. SESTRAS[1*]

[1] Faculty of Forestry and Cadastre, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, România
[2] Faculty of Horticulture and Business in Rural Development, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, România
[*]Corresponding author, e-mail: adriana.sestras@usamvcluj.ro

Introduction: Silver fir (*Abies alba* Mill.), one of the most important conifer species in European mountain forests, faces significant challenges due to changing climatic conditions and environmental stressors (Dobrowolska *et al*., 2017; Morar *et al*., 2024).
Aims: This study investigates the germination capacity of *A. alba* seeds from seven populations from different geographical areas in Romania. The research aims to understand the effects of different abiotic stress factors on seed germination, including salt and water stress as well as cold stress.
Materials and Methods: Four treatments were applied: control (seeds soaked in water at 18 °C for 24 hours), thermal stress (-40 °C for 7 days), salt stress (400 mM NaCl solution for 24 hours), and water stress (limited watering). Seeds from the first three treatments were watered every three days, while the water stress group faced periodic water shortages.
Results: The findings of this study provide insights into the adaptability of silver fir populations to various abiotic stresses, aiding in understanding their responses to climate change. Preliminary results show variability in germination among treatments and populations, indicating different sensitivities of silver fir seeds to cold, salt, and water stress. For all the germination stress factors, the seed germination varied among the tested provenances, the process being evidently and negatively affected by the stress factors, especially by salinity and low temperatures.
Conclusion: The study highlights the importance of choosing suitable seed sources for reforestation and conservation of *A. alba* species in Romania.

Keywords: abiotic stress, climate change, forest, germination

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TRADITIONAL WOOD CONSTRUCTIONS SPECIFIC TO BUKOVINA, INTEGRATED INTO SILVOTOURISM

Alexandru COLIȘAR[1],Vasile ȘIMONCA[1], Mircea Ioan VARGA[1], , Steluța-Maria SÎNGEORZAN[1], Vasile CEUCA[*1], Horia Dan VLASIN[1], Oana ERHAN[2]

[1] Faculty of Forestry and Cadastre, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania
[2] Touristic center „Conacul Bucovinei", Pojorâta, Suceava county, Romania
[*]Corresponding author, e-mail: vasile.ceuca@usamvcluj.ro

Introduction: In Bukovina, the wood was the raw material for the construction of the dwelling house and annexes, the village church, the traditional technical installations, as well as the majority household inventory related to occupations and crafts. The rural communities of Bukovina have the great advantage of being in an attractive region, known and loved by both Romanian tourists and foreign tourists. Bukovina is home to important UNESCO monuments, has an exceptional natural setting and a good reputation among Romanian and foreign tourists.
Aims: One of the major objectives proposed by silvotourism is to attract as many tourists as possible to promote the image and the natural environment of certain regions.
Materials and Methods: Within the Bukovina peasant architecture are visible the two European constructive systems, that of horizontal beam crowns, and that of a wooden structure filled with various materials, the first being dominant here. This form of home developed in a territory distinct from that of Central Europe, the roof being in four plans and the gable decorated in a rural Baroque style as it meets the old houses in Austria, Slovakia or Bohemia. Characteristic of Bukovina, is the skylight roof type ox-eye.
Results: Silvotourism offers the possibility of spending a relaxing holiday in the forests of Bukovina. The rural communities of Bukovina have the great advantage of being in an attractive region, known and loved by both Romanian tourists and foreign tourists. At the same time, we can build without demolishing the traditional houses in Bukovina. We can adapt them to contemporary needs or build new houses with traditional elements!
Conclusion: The perception of silvotourism, as a new form of tourism practiced especially in Bukovina, differs from one respondent to another. For many of them, the silvotourism promotion of the image of guest houses, others being of the opinion that this type of tourism helps them to market traditional products. It was found that the presence of monasteries, the natural landscape of the Bukovina area, but also habits and traditions are some advantages with an important role in promotion.

Keywords: rural constructions, forestry, monasteries

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POSTER PRESENTATIONS

SESSION 1 AND 2: AGRICULTURE AND ENVIRONMENTAL PROTECTION

PHOTOSYNTHETIC EFFICIENCY AND METABOLIC CHANGES IN *BRASSICACEAE* PLANTS UNDER COMBINED DROUGHT AND OZONE STRESS

Flavia BORTES[1,2], Lucian COPOLOVICI[1,2], Cristian MOISA[2], Andreea LUPITU[2], Dana COPOLOVICI[2]

[1]*Interdisciplinary Doctoral School of Aurel Vlaicu University, Elena Dragoi St. 2, Arad, Romania*
[2]*Institute for Interdisciplinary Research and Faculty of Food Engineering, Tourism and Environmental Protection, Aurel Vlaicu University, Elena Dragoi St. 2, Arad, 310330, Romania*
[*]Corresponding author, e-mail: flaviabortes@yahoo.com

Introduction: In the summer of 2022, Europe experienced its most severe drought in 500 years, leading to substantial environmental and agricultural disruptions. Simultaneously, researchers investigated the short-term effects of high ozone (O_3) levels on plant leaves and photosynthetic activity, noting significant damage and alterations in photosynthesis under elevated O_3 conditions. While individual stressors have been extensively studied, the combined impact of drought and ozone on photochemical characteristics and volatile organic compound (VOC) emissions remains largely unexplored.
Aims: We explore how plants from the *Brassicaceae* family react to drought stress in conjunction with ozone exposure. Specifically, we focus on the responses of *Raphanus sativus* var. Johanna, Helga, and Rozaria to these stressors, assessing their impact on photosynthetic parameters, VOC emission, and biochemical characteristics.
Materials and Methods: The plants underwent drought stress for seven days and were exposed to 100 ppb ozone for 1 minute to replicate real-world conditions. Photosynthetic parameters, including net assimilation rate and stomatal conductance to water vapor, were measured using a gas exchange system for both control and treated plants. VOCs were analyzed using GC-MS techniques. Quantitative analyses of photosynthetic pigments, such as chlorophyll a, chlorophyll b, and zeaxanthin, were conducted using UHPLC-DAD equipment.
Results: The photosynthetic parameters, including net assimilation rate and stomatal conductance to water vapor, decreased in plants subjected to drought stress and ozone fumigation, although no cumulative or synergistic effects were detected. The concentration of photosynthetic pigments, such as chlorophyll *a* and *b* and zeaxanthin, also declined under both stress conditions, even with the short exposure duration. Among the varieties studied Johanna showed greater resilience to drought and ozone stress than Helga and Rozaria.
Conclusion: In the present research work, we demonstrated that elevated carbon dioxide could negatively impact plants, making them less tolerant to heat stress.

Keywords: drought stress, plant photosynthesis, ozone.

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BIOCHAR FUNCTIONALISED WITH METAL OXIDES - POSSIBLE APPLICATIONS

Mariana BOCȘA[1], Adina STEGARESCU[2*], Ildiko LUNG[2], Ocsana OPRIȘ[2], Maria-Loredana SORAN[2], Septimiu TRIPON[2], Irina KACSO[2], Madalina MILITARU[3], Alin CÂRDAN[4] and Delia GLIGOR[4]

[1]Faculty of Food Engineering, Tourism and Environmental Protection, "Aurel Vlaicu" University from Arad, 77 B-dul Revoluției, 310130 Arad, Romania
[2]National Institute for Research and Development of Isotopic and Molecular Technologies, 67-103 Donat, 400293 Cluj-Napoca, Romania
[3]Research Institute for Fruit Growing, Marului, 402, Maracineni 117450, Arges Romania
[4]Faculty of Environmental Science and Engineering, Babeș-Bolyai University, 30 Fântânele, 400294 Cluj-Napoca, Romania
[*]Corresponding author, e-mail: adina.stegarescu@itim-cj.ro

Introduction: Biochar is a carbon-rich product resulted from the thermochemical conversion of carbonaceous materials in an oxygen-deficient environment at temperatures above 250 °C. The properties of biochar can be adjusted by including pre- and post-treatment steps such as doping, adding metal/metal oxide precursors, and activation to produce functionalized biochar. One of the most important functions of biochar is the ability to adsorb organic pollutants from environment. Biochar modification has been widely investigated to improve the adsorption performance in water treatment.
Aims: The aim of this study was focused on the preparation and characterization of cost-effective new materials based on biochar and biochar functionalized with metal oxides materials and preliminary tested for the removal of pollutants from aqueous solutions.
Materials and Methods: In this step, Biochar (Bch) was prepared from various vegetable wastes (e.g. tomato skins, tomato stems, sunflower seeds) and, following their physico-chemical characterization, the biochar obtained from tomato skins was chosen. The nanocomposites with metal oxide Bch-HCl/Fe_3O_4 were also obtained. They were characterized by FTIR spectroscopy, X-ray diffraction, Brunauer-Emmett-Teller (BET) and electron microscopy (TEM, SEM, EDX) and preliminary tests were also carried out on the adsorption of tartrazine and paracetamol from synthetic solutions.
Results: Adsorption tests for the removal of paracetamol and respectively tartrazine from synthetic water samples showed that the removal efficiency of paracetamol is the best in the case of Bch-HCl/Fe_3O_4/CuO material (34 %) and much lower in the case of the others, and for the adsorption tests for tartrazine a degree of high removal in case of Bch-HCl and Bch-HCl/Fe_3O_4/NiO materials (more than 90%)
Conclusion: The research brings information regarding the efficient adsorption of pollutants on biochar. In the next period, other tests will be performed and other metal oxides will be tested to find the best adsorbent material.

Keywords: adsorption, biochar, tartrazine, paracetamol.

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ASSESSMENT OF SURFACE WATER QUALITY ON UNIVERSITY AGRICULTURAL AND VETERINARY PROPERTIES: INSIGHTS AND IMPLICATIONS FOR SUSTAINABLE MANAGEMENT

Abdelouahed FANNAKH[1]*, Nicodim FIȚ[2]

[1] Department of Geoinformatics, Physical and Environmental Geography, Faculty of Science and Informatics, University of Szeged, Szeged, Hungary.
[2] Department of Paraclinical Sciences, Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, 3-5, Mănăstur Street, 400372 Cluj-Napoca, Romania.
*Corresponding author, e-mail: abdelouahed.fannakh@gmail.com

Introduction: Surface water quality on university campuses with agricultural and veterinary activities is vital for ecosystem sustainability and public health. This study evaluates the impacts of these activities on water quality at the University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca.
Aims: The study aims to assess how agricultural and veterinary activities influence surface water quality at the University. It identifies key contaminants, correlates them with land use, and aims to develop strategies that promote sustainable water resources and ecological health.
Materials and Methods: This study was conducted over two months, during which twenty-two surface water samples were systematically collected from locations around the university's areas impacted by educational farms and veterinary clinics. Water temperature and turbidity were measured using portable meters. pH and electrical conductivity were determined with a pH/conductivity meter. Nitrate concentrations were assessed using spectrophotometry. For microbiological analysis, water samples were tested for Total Bacterial Count, E. coli, Coliforms, Intestinal Enterococci, Pseudomonas aeruginosa, and Clostridium perfringens using membrane filtration followed by culturing on selective media appropriate for each organism. These methods provided comprehensive data, enabling a thorough analysis of the water quality in relation to agricultural and veterinary activities.
Results: Preliminary analyses revealed significant fluctuations in water quality, especially near veterinary waste discharge areas and downstream of agricultural lands. Elevated nitrate levels and microbiological contaminants such as E. coli and enterococci were predominant in samples closest to these high-impact zones, suggesting substantial influence from runoff and effluent discharges.
Conclusion: The findings underscore the urgent need for enhanced water management strategies that integrate continuous monitoring, stakeholder education, and regulatory enforcement to mitigate the environmental impact of agricultural and veterinary practices. This study emphasizes the role of systematic water quality assessment in ensuring sustainable management practices that safeguard both ecological and public health.

Keywords: Agricultural Runoff, Environmental Impact, Veterinary Discharges, Surface Water Quality, Sustainable Management.

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THE SELECTIVITY OF SOME HERBICIDES APPLIED IN PRE-EMERGENCE OF POTATO CV. ULTRA AND DARILENA IN THE SOUTH-EASTERN AREA OF TRANSYLVANIA

Manuela HERMEZIU[1*], Lorena ADAM[1] and Carmen CHELMEA[1]

[1]*National Institute of Research and Development for Potato and Sugar Beet, Brasov, Romania*
[*]Corresponding author, e-mail: hermezium@gmail.com

Introduction: Phytotoxicity refers to the ability of chemical substances to induce negative effects on plants. It includes substances like pesticides, herbicides, heavy metals, mineral salts, as well as environmental factors such as air pollution, UV radiation, and climate change (1).
Aims: In order to replace metribuzin successfully, the impact of other herbicides must be observed.
Materials and Methods: The results were based on a 2-year field experiment (2023-2024) conducted at the NIRDPSB Brasov and to a private farm in Codlea, Romania, using a randomized block design. The first factor consisted of potato cv. Ultra and Darilena, while the second one were weed control, with: T1 Control (untreated); T2 Sencor 70 WG – pre-emergence (0.9 l /ha); T3 Sencor 70 WG pre-emergence(0.65 l/ha) + Sencor 70 WG post-emergence (0,25 l/ha); T4 Sencor 70 WG + Aclofinen; T5 Aclofinen (4 l/ha). The phytotoxic effects of herbicides on potato plants was assessed on a scale from zero to 100, where zero meant no symptoms of crop damage and 100 signified crop death.
Results: No phytotoxic symptoms and no differences in crop vigor were observed on any plots. Metribuzin and aclonifen controlled broadleaf but less Setaria (monocot weed) without affecting potato yield. In 2023 the greatest total yield was observed in treatment with metribuzin+aclonifen (43.6 t/ha) in Brasov and in 2024 with aclonifen (41.6 t/ha) in Codlea.
Conclusion: In the present research work, we demonstrated that pre-emergent herbicides are an effective alternative to control weeds in potato crop and if they are correctly applied don't cause phytotoxicity and injury.

Keywords: herbicide, phytotoxicity, potato, weeds, yield

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PERFORMANCE OF WINTER TRITICALE (*TRITICOSECALE* WITTM.) IN TRANSYLVANIAN PLAIN

Diana HIRIȘCĂU[1], Rozalia KADAR[1], Adina Varadi[1], Andreea-Sabina PINTILIE [2*] and Ionut RACZ[3]

[1] Agricultural Research and Development Station Turda, 27 Agriculturii Street, Turda, Cluj, Romania
[2] Agricultural Research and Development Station Secuieni, 371 Main Street, Secuieni, Neamț, Romania
[3] University of Agronomic Sciences and Veterinary Medicine of Cluj - Napoca, 3 - 5 Mănăştur Avenue, 400372, Cluj, Romania
[*]Corresponding author, e-mail: andreeasabina97@yahoo.com

Introduction: Triticale (*Triticosecale* Wittm.) is a species of cereal obtained by crossing common wheat with rye, which gives it a good capacity to adapt to different weather conditions. However, triticale requires more moderate temperatures during the grain filling phase, which is why it produces higher yields and better quality in cooler areas. As with other cereals, nitrogen fertilization plays an important role in achieving high yields and good quality.
Aims: This study aims to analyse the effects of weather conditions and additional nitrogen fertilization on winter triticale yield and to identify a suitable genotype for the Transylvanian Plain.
Materials and Methods: Field experiments were conducted at ARDS Turda over three growing seasons (2021, 2022 and 2023) using seventeen winter triticale genotypes. A randomized block design in six replications was used to conduct the experiments, with the first 3 replications additionally fertilized (N_{100} kg ha^{-1}).
Results: For the triticale crop, the best weather conditions were in 2021, when the range of mean yield was between 8200 (N_{50}) and 8790 (N_{100}) kg ha^{-1}. Biplot analysis indicates that the Vifor (9090 kg ha^{-1}), Cordial (8999 kg ha^{-1}), Utrifun (8914 kg ha^{-1}), Zaraza (8672 kg ha^{-1}), Zori (8628 kg ha^{-1}) and Cascador F (8628 kg ha^{-1}) genotypes exihibit a lack of sensitivity to environmental interactions, consistently achieving the highest yields over the three years of the study. To additional nitrogen fertilization (N_{100}), the Titan, Tulnic, Zaraza, Zvelt, Stil, Vultur, Utrifun and Zori genotypes responded with significant yield increases (over 700 kg ha^{-1}) compared to N_{50}.
Conclusion: In the Transylvanian area, triticale meets very good growing conditions, the most suitable varieties being Utrifun, Zaraza and Zori, especially when applying additional nitrogen fertilization.

Keywords: additional nitrogen fertilization, winter triticale, yield.

THE INFLUENCE OF CROP ROTATION ON THE FAUNA OF PEST INSECTS IN THE CONDITIONS OF SOUTHERN ROMANIA

Maria IAMANDEI[1]*, Raluca Gabriela GEORGESCU[1], Madalina RĂDULEA[1], Ionuț Cristian POPA[1], Luxița RÂȘNOVEANU[2]

[1] *Research Development Institute for Plant Protection, Bucharest, Romania*
[2] *Braila Agricultural Research and Development Station, Braila, Romania*
*Corresponding author, e-mail: maria_iamandei@yahoo.com

Introduction: During the first vegetation stages, maize crops are extremely vulnerable to the attack of soil pest species. The soil-dwelling insect species might form complex assembly that can differ significantly across various farming systems and soil type. Despite of topic importance, there has been limited researches about the responses of soil fauna to environmental changes or different cropping systems.
Aims: The aim of the study was to evaluate the influences of crop rotations on the population density and community composition of soil pest insects on maize crops.
Materials and Methods: The field survey was conducted in the experimental farm of *Braila ARDS,* in four plots, each one cultivated with maize after the following: (i)sunflower, (ii)wheat, (iii) pea and (iv) maize. Pitfall traps were used for the sampling of the soil fauna between April and mid July 2024. The material was examined, pest species individuals were separated and numerical abundance and relative frequency of each taxon, species richness and Shannon-Weiner diversity indices were calculated for each treatment using Past 4.03 software.
Results: Overall, one Lepidopteran species and 14 pest species assigned to six Coleoptera families were collected. The complex formed by *Tanymecus dilaticollis, T. palliatus* and *Opatrum sabulosum* was dominant in all study treatment plots. The crop rotation influenced the pest dynamics and numerical abundance of each treatment plots, monocropping system was the leading treatment in term of total catches. The differences between the treatments are discussed.
Conclusions: The paper brings actual data on the specific composition of pest associated with maize crops in south-eastern Romania at Braila. The results of our study highlight the importance of considering crop rotation as key factors influencing soil biota communities.

Keywords: Crop rotations, Maize, soil pests' diversity

Acknowledgement: This study was performed within the project ADER 2.1.1, financially supported by the Ministry of Agriculture and Rural Development, Sectoral Plan for 2023 – 2026.

RESEARCH ON THE EVALUATION OF QUANTITATIVE CHARACTERISTICS IN DRY BEANS IN THE CONTEXT OF CLIMATE CHANGE IN CENTRAL MOLDAVIA, ROMANIA

Simona – Florina ISTICIOAIA[1], Alexandra LEONTE[1*], Andreea – Sabina PINTILIE[1], Lorena - Diana POPA[1], Raluca REZI[2], Camelia URDĂ[2], Dumitru – Dorel BLAGA[3], Danela MURARIU[3], Gheorghe MATEI[4], Paula – Lucelia PINTILIE[1]

[1] *Agricultural Research and Development Station Secuieni, Neamț, Romania*
[2] *Agricultural Research and Development Station Turda, Cluj, Romania*
[3] *Vegetable Research and Development Station Suceava, Suceava, Romania*
[4] *Faculty of Agronomy - University of Craiova, Dolj, Romania*
[*]Corresponding author, e-mail: andra29nt@yahoo.com

Introduction: *Phaseolus vulgaris* L. is a valuable source of nutrients, and as a nitrogen-fixing plant, it improves soil fertility, reducing the need for chemical fertilizers and promoting sustainable agriculture.
Aims: The main objective of the study conducted at ARDS Secuieni was to diversify agricultural crops in the Moldova Center by expanding the acreage of dwarf field beans in farms.
Materials and Methods: In the experimental field at ARDS Secuieni, the growth of bean crops was monitored under different climatic conditions. The biological material used in the experiment was the Delia variety and the study focused on assessing the quantitative characteristics of beans, including yield, as well as analyzing the economic efficiency of bean yield. Weather data were obtained from the unit's own meteorological station, located in the experimental field.
Results: The analyzed parameters varied significantly from year to year, being negatively affected by soil drought and atmospheric heat. Seed yields showed high variability from year to year, ranging from 956 kg·ha^{-1} to 1244 kg·ha^{-1}. Even though bean yields were significantly reduced, the net profit achieved under the conditions at S.C.D.A. Secuieni was substantial, ranging from 4309 lei·ha^{-1} to 7022 lei·ha^{-1}.
Conclusion: The study conducted at ARDS Secuieni highlighted that, in addition to its recognized nutritional benefits, field beans also offer high economic profitability. Expanding the area cultivated with this crop would improve economic returns and contribute to agricultural sustainability.

Keywords: climatic conditions, field beans, profitable agriculture, sustainability

Acknowledgement: This work was supported by a grant of the Ministry of Agriculture and Rural Development, ADER 2026, Project no. 1.3.3.

ANTIBIOTICS REMOVAL FROM WATER USING NEW ADSORBENT MATERIALS OBTAINED FROM FRUIT WASTES

Ildiko LUNG[1], Maria-Loredana SORAN[1], Ocsana OPRIŞ[1*], Adina STEGARESCU[1], József-Zsolt SZÜCS-BALÁZS[1], Ancuța BALLA[1] and Stelian PINTEA[2]

[1] *National Institute for Research and Development of Isotopic and Molecular Technologies, 67-103 Donat, 400293 Cluj-Napoca, Romania*
[*]Corresponding author, e-mail: ocsana.opris@itim-cj.ro

Introduction: One cost-effective, eco-friendly, and sustainable approach for managing agricultural waste is converting it to useful forms. Agricultural wastes such as stalks, cobs, husks, leaves, trunks, food wastes, etc have been used as biochar (a carbon-rich material) precursors, providing biochar with a larger specific surface area, greater porosity, and more functional groups than the initial agricultural waste. Due to these advantages, biochar is used as a renewable carbon material in many areas, especially soil amendment and environmental management. Thus, biochar derived from agricultural wastes is a potential solution to the water pollution problem.
Aims: The aim of this paper consisted of the development of novel and low-cost materials based on biocompatible polymer and biochar, obtained from apple wastes, functionalized with metal oxides for the removal of antibiotics from water.
Materials and Methods: Preparation of biochar from apple wastes was performed by pyrolysis under different conditions (Ar atmosphere, temperatures of 500°C, 700°C), and functionalized with metal oxides nanoparticles (Fe_3O_4 and NiO) obtained by green synthesis using plant extracts as reducing and stabilizing agents. The materials obtained were encapsulated in biocompatible polymers (alginate). The prepared materials were evaluated for their adsorption capacity of selected antibiotics (ciprofloxacin, tetracycline, and trimethoprim). The evaluation of antibiotics' removal from water was performed by high-performance liquid chromatography (HPLC).
Results: The results obtained showed that the best material adsorbent for ciprofloxacin (99.51% removal) was biochar activated with NaOH/HCl, for tetracycline (72.51%) was biochar with Fe_3O_4/NiO in the presence of plant extract and for trimethoprim (100%) were biochar activated with NaOH/HCl, biochar with Fe_3O_4, and biochar with Fe_3O_4/NiO in the presence of plant extract.
Conclusion: Biochar obtained from fruit wastes can be considered an environmentally friendly promising tool for water decontamination.

Keywords: adsorption, antibiotics, apple wastes, biochar, removal.

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THE EFFECT OF DIFFERENT TYPES OF STRESSES ON PLANT'S VOLATILE ORGANIC COMPOUND EMISSIONS

Andreea LUPITU[1], Lucian COPOLOVICI[1,2*], Flavia BORTES[1,3], Maria COJOCARU-TOMA[4], Angelica OHINDOVSCHI[4], Mihaela NARTEA[4], Cristian MOISA[3], Dana COPOLOVICI[2]

[1]Institute for Interdisciplinary Research, Aurel Vlaicu University, Elena Dragoi St. 2, Arad, 310330, Romania
[2]Faculty of Food Engineering, Tourism and Environmental Protection, Aurel Vlaicu University, Elena Dragoi St. 2, Arad, 310330, Romania
[3]Interdisciplinary Doctoral School of Aurel Vlaicu University, Elena Dragoi St. 2, Arad, 310330, Romania
[4]State University of Medicine and Pharmacy "Nicolae Testemițanu" of the Republic of Moldova, Stefan cel Mare si Sfant Boulevard 165, MD-2004, Chișinău, Moldova
[*]Corresponding author, e-mail: pag.andreea@yahoo.com

Introduction: Various biotic and abiotic stressors, including pests, diseases, and herbivores, as well as severe temperatures, salt, and drought, can affect plants. Different defense mechanisms, classified as either direct or indirect, are used by plants to deal with various stresses. Creating chemical defenses like poisonous chemicals or enzymes that ward off infections and herbivores and physical barriers like trichomes and thorns are examples of direct defense tactics. By releasing volatile organic compounds to draw predatory insects that feed on the herbivores attacking the plant, indirect defense tactics aim to draw in natural enemies of diseases or herbivores.
Aims: Our goal was to ascertain how the volatile organic compounds emissions from the *Helichrysum* genus change under different abiotic stresses.
Materials and Methods: Plants from the *Helichrysum* genus were grown from seeds in growth chambers, and different abiotic stresses (temperature, drought, flooding) were applied. The emissions of volatile organic compounds (VOCs) were monitored.
Results: Several compounds such as benzaldehyde, benzeneacetaldehyde, linalool, myrtenal, and benzyl alcohol were identified in the mixture of volatile organic compounds emissions. Under different types of stresses, the VOCs emissions change depending on the type of stress applied.
Conclusion: Our study demonstrated that the plants from *Helichrysum* genus exhibit significant changes in the pattern of emission of VOCs under abiotic stress. The findings imply that when plants are subjected to abiotic stress, their emissions of VOCs change depending on the type of stress applied. Research into the patterns of VOCs emissions during stress can provide insights into plant responses and potential agricultural applications for stress management.

Keywords: volatile organic compounds, plant stress, *Helichrysum* genus.

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ANTIFUNGAL EFFECTS OF ESSENTIAL OILS ON PLANT PATHOGENS

Florentina-Veronica ONIȚA[1], Vasile FLORIAN[1]

[1] *Faculty of Agriculture, University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca, Calea Mănăștur (Street No 4-5., Cluj-Napoca, Cluj, 400001, Romania*
[*]Corresponding author, e-mail: florentina-veronica.onita@usamvcluj.ro

Introduction: The Genera *Alternaria*, *Fusarium*, and *Aspergillus* are known for producing toxins, which is why biological control of pathogens is sought using essential oils.
Fungal infections are caused by eukaryotic organisms, making them more difficult to treat compared to bacterial infections. The fungal cell wall, composed of chitin, represents a target element for phytopathogenic agents.
Aims: Biological control of plant pathogens using essential oils in various doses and concentrations, and identification of oils with antifungal potential for each genus studied.
Materials and Methods: The use of a wide range of bibliographic sources to obtain up-to-date information on the proposed topic."
Results: The antifungal effect of different concentrations of *Origanum vulgare* subsp. *vulgare* on *Alternaria* spp. is evident through the suppression of mycelial growth, which increased proportionally with the concentration of essential oil (Chrapačienė et al. 2021). Regarding the Genus *Fusarium*, clove oil (*Syzygium aromaticum*) was most effective against *Fusarium oxysporum* f.sp. *lycopersic*i, completely inhibiting mycelial growth and spore germination (Sharma et al. 2017). Concerning the species belonging to the Genus *Aspergillus*, essential oils containing carvacrol and/or thymol (*Satureja montana* and *Origanum vulgare*) were used, having the greatest activity against the fungal growth of *Aspergillus parasiticus* (Soares et al. 2016).
Conclusion: Essential oils, due to their antimicrobial and antifungal properties, are considered promising alternatives. Their compounds, such as terpenes and terpenoids, can disrupt fungal cell membranes, thereby inhibiting the growth and sporulation of fungi.

Keywords: antifungal properties, essential oils, phytopathogenic agents.

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CERIUM DOPED ZINC OXIDE NANOFLOWERS AS ELECTROD MATERIAL FOR SUPERCAPACITORS

Adriana POPA, Dana TOLOMAN*, Maria STEFAN, Arpad ROSTAS, Ameen AMMAR, Ana VARADI, Sergiu MACAVEI, Cristian LEOSTEAN, Emre ERDEM

National Institute for Isotopic and Molecular Technologies, Donat 67-103, Cluj-Napoca, Romania
*Corresponding author, e-mail: dana.toloman@itim-cj.ro

Introduction: Decarbonization and the replacement of coal-fired power plants with solar and wind farms require sufficiently large energy storage facilities. The supercapacitors (SC) are promising candidates for energy storage devices due to their high-power density, storage capacity, specific capacity, fast charge-discharge time, low input resistance, non-polluting for the environment, and an extended life cycle. Metal oxides are a class of electrode materials popularly used for SC applications.
Aims: The performance of SC devices is strongly affected by the physical and chemical properties of the electrode material. Herein, we demonstrate an efficient strategy to enhance the capacitive characteristics of ZnO by doping with Ce ions. Doping creates defect centers that can be customized to enhance the material's performance. Moreover, represents an effective method for boosting the carrier concentration.
Materials and Methods: The Ce doped ZnO were synthesized by chemical precipitation method. The morpho-structural and optical characterization were done. Symmetric SC devices were designed using Ce-doped ZnO, KOH electrolyte and a glass fiber separator in between. A BioLogic VMP 300 electrochemical device was used to investigate the electrochemical performance.
Results: ZnO nanoparticles (Nps) have a flower-like morphology. The presence of both Ce^{3+} and Ce^{4+} ions in the ZnO lattice was evidenced. Zn and positively charged oxygen vacancies are present in the samples. Furthermore, it was found that Ce doping influenced the Zn-related defect center level and the electrochemical performances
Conclusion: In the present research work, we demonstrated that by doping we can increase the electrochemical performances of ZnO Np. It was observed that the 0.6% Ce-doped ZnO have the highest performance, exhibiting a specific capacitance of 91.3 F/g and energy density of 12.7 Wh/kg and and a cyclic stability of 95% after 1000 cycles.

Keywords: Defect centers; Energy storage; ZnO.

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MANGANESSE DOPED ZINC OXIDE MODIFIED GRAPHITIC CARBON NITRIDE PHOTOCATALYS FOR ENVIRONMENTAL APPLICATION

Adriana POPA, Maria STEFAN, Ana VARADI, Cristian LEOSTEAN, Sergiu MACAVEI, Arpad ROSTAS, Ovidiu PANA and Dana TOLOMAN*

National Institute for Research and Development of Isotopic and Molecular Technologies, 67-103 Donath, 400293 Cluj-Napoca, Romania

*Corresponding author, e-mail: dana.toloman@itim-cj.ro

Introduction: Industrial effluents containing organic pollutants such as dyes are highly toxic and difficult to biodegrade. These pollutants are genotoxic and can disturb endocrine systems even at low concentrations; therefore, they are dangerous to human health. In order to reduce the risk of pollution and allow water recycling, it is required to remedy industrial wastewater before its sewerage. Visible light-driven photocatalysis to degrade organic water pollutants is a cheap, clean, and convenient alternative to other water pollution abatement strategies using chemical, biological, and physical methods.
Aims: Taking into account the necessity of obtaining efficient visible light-driven photocatalysts, we developed a composite material based on g-C_3N_4 and Mn doped ZnO.
Materials and Methods: Mn doped ZnO-g-C_3N_4 composite materials were prepared in two stages: g-C_3N_4 nanosheets by thermal decomposition of melamine and Mn doped ZnO was recycled from alkaline batteries. The obtained composite samples were characterized by XRD, EPR, XPS, TEM, UV-VIS, PL.
Results: Both crystalline phases are presented in composite: ZnO in wurtzite structure and g-C_3N_4. The presence of Mn^{2+} ions as dopant in the lattice of ZnO was demonstrated by EPR. Mn doped ZnO have a rods like shape and g-C_3N_4 has a nanosheets morphology. The values of the optical band gap energy of the composite samples are between that corresponding to Mn doped ZnO and g-C_3N_4. The photocatalytic activity of the sample with the best photocatalytic performance is 90% in 180 min.
Conclusion: The obtained composites materials based on g-C_3N_4 and Mn doped ZnO have enhanced photocatalytic performance against RhB pollutant solution under visible irradiation.

Keywords: water depollution; composite material; photocatalysis.

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LEAF AREA AND LENGTH ANALYSIS FOR RASPBERRY PROMIK BASED ON IMAGE PROCESSING TOOL

Alin Laviniu POPA[1], Ștefania GÂDEA[1], Valentina STOIAN[1]*, Sorin VÂTCĂ[1]

[1]*University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Mănăştur str., 3-5, 400372, Cluj-Napoca, Faculty of Agriculture,*
*Corresponding author: valentina.stoian@usamvcluj.ro

Introduction: Plant leaves represent the main organ responsible for photosynthesis, gas exchange velocity and water regulation (Ackerly and Stuart, 2009).
Aims: The study aim was to find and test a new adapted method for assessing leaf area and length for raspberry.
Materials and Methods: Raspberry Promik cultivar leaves were collected from the field in the first year of acclimatization to the urban gardening conditions. Three sets of images were made with the different leaves on black board background. Further the images were processed in PowerPoint and the background was removed and the artistic effect glow edges filter was applied. After this step the Digimizer 6.4.3. software for image analysis was used. First step was establishing a unit of 10 cm and used for default calibration of all measurements. The Image contrast was auto fixed, the binarization of the picture was done and in the final step analyze objects from the main menu was selected. All data was exported and centralized in excel file, filtered by conditional formatting from lowest to highest and according different color intensity were extracted seven classes of leaf area and leaf length mean and ranges.
Results: The results of leaf area values place raspberry from the first adaptation year in the third class following maximum range value and fourth class by the mean values. In terms of raspberry Promik leaf length the mid-range class and average values were highlighted in the fourth class number. The results were checked and it was found that all were according Kutuzov method following the formula: 2/3 × length × width.
Conclusion: Digimizer software represent a useful tool for obtaining with accuracy results of areas and lengths for leaf assessment of raspberry. In the acclimatization year, raspberry leaves area and length could be classified in 7 range classes.

Keywords: Digimizer, leaf area, leaf automatic measurement, leaf length

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VARIATION OF QUANTITATIVE TRAITS OF SPRING WHEAT GENOTYPES UNDER DIFFERENT ECOLOGICAL CONDITIONS

Ionut RACZ[1,2], Rozalia KADAR[1] Diana HIRISCAU[1], Adina VARADI[1], Darius MORAR[1], Beniamin ANDRAS[3], Gabriela GORINOIU[4]

[1] *Agricultural Research and Development Station Turda*
[2] *Faculty of Agriculture, University of Agricultural Science and Veterinary Medicine Cluj Napoca*
[3] *Agricultural Research and Development Station Livada*
[4] *Agricultural Research and Development Station Lovrin*
[*]Corresponding author, e-mail: ionut.racz@scdaturda.ro

Introduction: wheat is one of the main crops worldwide and phenotypic expression of yield and yield components can be limited by environmental conditions. Even if the adaptability of wheat plants are very large, local conditions of different microclimate can limit the expression of yield and quality potential. The agronomic value of a genotype is given by the its performances under different stress and non-stress conditions.
Aims: the main purpose of this paper is to identify the best performing wheat genotypes both in terms of grain production and their quality in different ecological conditions.
Materials and Methods: 25 wheat genotypes (two control genotypes and 23 perspective lines) were tested in a field condition in three different ecological condition (Agricultural Research and Development Station from Turda, Agricultural Research and Development Station Livada, respectively Agricultural Research and Development Station Lovrin) for their grain yield potential and grain quality.
Results: the obtained experimental results highlighted different genotypes for each of the three locations, but the centralization of the data allowed the identification of four genotypes for yield performance respectively six genotypes for grain quality.
Conclusion: the testing of wheat genotypes in different ecological conditions allowed the identification of the perspective line T. 4007-19 and T. 2601-22 having a high productivity, respectively T. 4173-19 and T. 2585-22 as superior grain quality, combining the two agronomic characters in a favourable way.

Keywords: adaptability, grain quality, grain yield, wheat

RESEARCH ON THE IMPACT OF CLIMATE CHANGE ON THE CONTROLLED REPRODUCTION OF CULTURED FISH

Silvia RADU, Nicoleta Georgeta DOBROTĂ, Mioara COSTACHE, Daniela RADU, Gheorghe DOBROTĂ, Nino MARICA, Alin Constantin BARBU

Fish Culture Research and Development Station Nucet, Romania
street Principală, no. 549, 137335,
*Corresponding author email: dobrota19dng@yahoo.com

Introduction: Climate change is a global phenomenon, which endangers natural, social and economic systems through their sensitivity and vulnerability to climate factors. The direct effects of climate warming can be understood through fatal declines in an organism's performance in growth, reproduction, feeding, immune competence, behaviors and competitiveness.
Aims: The objective of the work was to study the impact of climate change on the controlled reproduction of the main cultured fish species within the experimental base Nucet – S.C.D.P. Nucet.
Materials and Methods: The study was carried out over a period of 10 years (2014-2023) and includes: the evolution of water and air temperature; average annual precipitation; the main hydrochemical water quality parameters; the beginning and end of the reproductive cycle in the main crop species, the number of degree days accumulated between two reproductive cycles. The study involved the following stages: collection of samples from the field; analysis of samples in the laboratory; processing and interpretation of the data obtained from the analyses.
Results: The average monthly air temperature in the breeding season of most cultured fish species (March, April, May, June) recorded the lowest values in 2022 (13.45 ^{0}C), and the average monthly water temperature of recorded the lowest values in the year 2021 (16.195^{0}C). The analysis of the multi-year variation of the annual precipitation indicates the occurrence after 2017 of a series of dry years, due to the decrease in the amount of precipitation, corroborated with the tendency of the average annual temperature to increase.
Conclusion: Establishing the impact of climate change on the controlled reproduction of cultured fish helps to test all species in terms of their adaptation abilities and to find genetic resources at the population level, to form a basis for the generation of new species. Thus, the appearance of new species on a national scale can be expected, which will have the adaptive capacity to withstand thermal variations.

Keywords: climate change, controlled reproduction, fish

THE STUDY OF THE GALLOWAY BREED UNDER GRAZING CONDITIONS AT COJOCNA FARM

Mirela RANTA[*], Florin PĂCURAR, Ioana GHEȚE, Anamaria MĂLINAȘ

[1]*Faculty of Agriculture, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania*
[*]Corresponding author, e-mail: mirela.ranta@usamvcluj.ro

Introduction: The large pasture areas in Romania are not exploited to their maximum potential, this way an analysis was made of the possibilities of exploiting these resources with the Galloway breed, which can convert either good or mediocre quality grass into quality meat. The study was carried out at Cojocna Farm -USAMV Cluj, both on the existing grassland and on the Galloway breed. The grassland study was carried out at the Cojocna farm an area of 20 ha from plot 13 belonging to the Natura 2000 Site ROSCI0238 Suatu – Cojocna – Suatu-Cojocna-Crairât.
Aims: The aim being the study on the adaptability of the Galloway breed in an extensive system in the pedoclimatic conditions at the Cojocna farm.
Materials and Methods: Our research was based on a study carried out on the animals that grazed in Cojocna where the following objective was pursued: Study of the effect of Galloway grazing on the ecological and agronomic value of Natura 2000 habitats; Identification of the correlation between ADG (average daily growth) and the floristic composition of the pasture at the Cojocna farm; Elaboration of specific measures to improve the types of grassland) Elaboration of measures regarding the exploitation technology of Galloway beef cows raised in an extensive system. The research activity was carried out the year 2023. The research methods used are: weighing the calves according to the official performance control (COP) methodology to determine the average daily gain ADG and the geobotanical method using the Braun-Blanquet interpretation scale to identify the types of grassland on the 2 descriptive plots (PD1 - type of grassland *Festuca rupicola* and PD2 - type of grassland *Stipa capillata*).
Results: The average daily gain (ADG) are within breed performance even if the grassland type is *Festuca rupicola* and *Stipa capillata* - moderately tolerant to grazing. The Galloway breed makes good use of moderately productive pastures and can contribute to the preservation and improvement of the conservation status of the Natura 2000 habitat Suatu-Cojocna-Crairat.
Conclusion: The Galloway breed adapted very well to the conditions at Cojocna. Under the conditions at Cojocna, the Galloway breed registered weight increases corresponding to the breed. Abandonment of grassland areas has led to severe degradation of the sward and depreciation of grassland class, category and livestock load.

Keywords: Galloway breed, grassland, adaptability, average daily gain

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EFFECTS OF RHIZOBACTERIA AND PHOSPHORUS SOURCES ON ROOT PHOSPHATASE ACTIVITY AND PHOSPHATES CONTENTS OF RHIZOSPHERE SOIL UNDER WATER STRESS

Vladimir ROTARU[1]

[1]*Institute of Genetics, Physiology and Plant Protection, Moldova State University, Republic of Moldova*
[*]Corresponding author, e-mail: rotaruvlad@yahoo.com

Introduction: Plant growth promoting rhizobacteria (PGPR) may constitute a sustainable approach to increase roots and soil biological activity, and can improve the contents of soil fertility.
Aims: Two bacterial treatments (*Burkholderia cepaceia* strain B/36 or *Enterobacter radicincitans* strain DSM 16656) were tested in conjunction with a soluble and insoluble source of phosphorus (P) under normal and water stress conditions.
Materials and Methods: Greenhouse pot experiments were conducted using soybean (*Glycine max*. L.) on a P-deficient soil. Water stress (35% WHC) was imposed at flowering stage of plants for 12 days. After that, the plants were harvested and the roots phosphatases activities (APase) and available phosphates of soil were measured.
Results: The APase activity of roots was affected by the rhizobacteria spices and sources of P. Higher activity of root APase registered under insoluble P sources due to application of *Burkholderia* species. This trend displayed regardless of the soil moisture level. Under temporary drought, the acid phosphatase activity was higher in the treatment with *Burkholderia* than in the *Enterobacter* inoculated treatment. Strain B/36 was more efficient than DSM 16656 in terms of influencing root acid phosphatase activity of soybean, grown under temporary water deficit conditions. This study indicates that inoculation with *Burkholderia* sp. was like a biofertilizer in P-deficient soils since it increased enzyme activity and P availability in soils and favored soybean growth, constituting a feasible option to increase efficiency of the phosphoric fertilizer amendment.
Conclusion: The results demonstrated that root activity APase can be induced under P-deficient soils by rhizobacteria *Burkholderia cepaceia* B/36 inoculation under well-watered and temporary water stress conditions. The application of *Burkholderia cepaceia* B/36 is more efficient in improving the enzyme activity and phosphates contents in rhizosphere soil under normal soil moisture conditions than the *Enterobacter* sp. strain DSM16656.

Keywords: phosphatase activity, phosphates, rhizobacteria, soybean, water stress.

ECO-FRIENDLY SYNTHESIS OF ZNO-CAO NANOCOMPOSITES USING WASTE EGGSHELL

Manuela STAN[1]*, Alexandra CIORITA[1], Dan SILIPAS[1] and Sergiu MACAVEI[1]

[1] *National Institute for Research and Development of Isotopic and Molecular Technologies, 67-103 Donat, 400293 Cluj-Napoca, Romania*
*Corresponding author, e-mail: manuela.stan@itim-cj.ro

Introduction: The growing concern about environmental damage has led to increased interest in eco-friendly synthesis of composite materials. Among various metal oxides, ZnO and CaO nanoparticles (NPs) are considered biocompatible and biosafe materials frequently used in nanomedicine and cosmetics. Eggshell is a solid waste which can be utilized in a sustained manner as a source of CaO NPs for effective photocatalytic degradation of organic dyes (Vanthana Sree *et al.*, 2020).
Aims: The aim of the current work is the environmentally friendly synthesis of composite materials based on ZnO and CaO derived from chicken eggshell waste.
Materials and Methods: CaO was produced from chicken eggshell by calcinations, while ZnO NPs were obtained by precipitation method using ethanol and water as solvents. Several nanocomposite characterization techniques have been used for investigation: X-ray diffraction (XRD), transmission electron microscopy (TEM) and scanning electron microscopy (SEM).
Results: To obtain CaO particles, the eggshell powders were subjected to calcination at temperatures between 800°-1000 °C. The optimum calcination conditions are 800 °C and 5 hours. The average crystallite size of ZnO (17.5 nm) and CaO (83.5 nm at 800 °C) was determined by XRD. The microscopic images revealed the formation of polyhedral particles.
Conclusion: In the present research work, we evidenced that this is an interesting eco-friendly approach focusing on the production of ZnO-CaO composite materials with different quantities of the two components for potential suitable applications.

Keywords: eco-friendly synthesis, ZnO-CaO nanocomposites, waste materials

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IMPACT OF LONG-TERM NITROGEN & PHOSPHORUS FERTILIZATIONS PRACTICES ON SOIL RESPIRATION POTENTIAL

Patrick URSAN[1], Alexandra GHEORGHIȚĂ[1], Vlad STOIAN[1], Driss TOUHAMI[2], Roxana VIDICAN[1]*

[1]*Faculty of Agriculture, University of Agricultural Sciences and Veterinary Medicine, Cluj-Napoca*
* Corresponding author, e-mail: roxana.vidican@usamvcluj.ro
[2]*College of Sustainable Agriculture and Environmental Sciences, Mohammed VI Polytechnic University, Benguerir, Morocco, e-mail: driss.touhami@um6p.ma*

Introduction: Long-term nitrogen (N) and phosphorus (P) fertilization significantly influences soil microbiological dynamics, directly affecting soil respiration. Soil respiration, an indicator of microbial activity, reflects the microorganisms' capacity to decompose organic matter and sustain essential biogeochemical cycles. This study examines the impact of prolonged N and P fertilization on soil respiration potential. Aim: The objective is to assess the long-term effects of N and P fertilization on carbon dioxide emissions and determine how these practices influence soil health and ecological balance.
Aim: The study aims to evaluate the long-term influence of nitrogen and phosphorus fertilization on carbon dioxide emissions and determine how these practices affect soil health
Materials and Methods : The analysis was performed using a portable gas detector, ADC BIOSCIENTIFIC LCI-SD. Soil respiration was measured across three different treatments (N, P, NP) each with three replicates. The average of the last five readings for each treatment was used as the reference value for soil respiration potential. Soil respiration was measured during both winter and summer, and in the summer, soil water content was also measured using a portable moisture meter
Results:The results show a circadian rhythm of respiration during the day, and comparing winter with summer, we can observe that higher temperatures favored an increased CO2 flux even during the winter
Conclusion: Applying the 4R principle—right source, rate, time, and place—can reduce the environmental impact of fertilization. By selecting the correct type of fertilizer (right source) and applying it at the proper dosage (right rate), nutrient overuse and runoff are minimized. Timely application (right time) aligns with crop demand, ensuring maximum nutrient uptake and minimizing losses. Proper placement (right place) reduces leaching and volatilization, preventing nitrogen and phosphorus from contaminating water systems. These practices enhance soil health, optimize crop yield, and lower the ecological footprint of agriculture.

Keywords: Climate change, CO2 emissions, Fertilization, Soil respiration, Long-term experiment

DYNAMICS OF WOLF DISTRIBUTION IN THE CONTEXT OF ANTHROPOGENIC PRESSURE IN A PROTECTED AREA OF NORTHWESTERN ROMANIA

Bogdan VASILESCU[1, 2]*, Mirela COMAN[3]

[1] *Faculty of Agriculture, University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca, Romania*
[2] *Faculty of Sciences, Technical University of Cluj-Napoca, Romania*
[3] *Faculty of Engineering, Technical University of Cluj-Napoca, Romania*
*Corresponding author, e-mail: bvasilescu0@gmail.com

Introduction: In recent decades, anthropogenic impact on the environment has significantly increased, leading to escalating pressures on wildlife populations. Although wolves are considered one of the most adaptable and widespread large mammal species globally, their distribution is heavily influenced by human activities (Boitani & Mech, 2003). Wolves prefer relatively large, forested areas with healthy prey populations and limited human presence and tend to avoid intensively cultivated landscapes, where food and shelter are scarce and human presence is constant (Chapron et al., 2014).
Aims: The present study evaluated wolf distribution and habitat selection in relation to the degree of anthropogenic impact within the protected natural area of Pricop-Huta-Certeze.
Materials and Methods: Field data were obtained over two years using the presence sign survey method. Data were analysed and presented using QGIS.
Results: Wolf distribution and movement was influenced by human activities, habitat quality, forest cover, presence of roads and season. Wolves avoided the whole western part of the protected area due to the very high degree of anthropogenic impact and poor habitat. Wolves preferred areas with lower human activity and higher forest cover, tended to avoid active logging sites and only crossed the main road during winter. The pack's nesting and rearing area was outside the protected area.
Conclusion: In the present research work, we present the impact human activity has on the distribution and habitat selection of *Canis lupus* in a protected area in NW Romania.

Keywords: anthropogenic impact, *Canis lupus,* distribution, protected areas

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STUDIES ON ZINC-POTASSIUM SULFATE DOUBLE SALT, AS POTENTIAL COMPLEX FERTILIZER

Monica M. VENTER[1]*, Eszter E. TOASO[1] and Liliana A. BIZO[1]

[1] *Faculty of Chemistry and Chemical Engineering, Babes-Bolyai University Cluj-Napoca, Romania*
* Corresponding author, e-mail: monica.venter@ubbcluj.ro

Introduction: Potassium is a primary macronutrient with a major contribution to transport of photosynthates and assimilation of CO_2 in plants. In addition, Zn is a micronutrient involved in metabolism of nitrogen and protein synthesis in plants. Both nutrients are taken up in ionic form, by roots, which implies a good water solubility of the fertilizer product. (Ullmann, 2007)
Aims: The aim of this study is to introduce the zinc-potassium sulfate hexahydrate as potential complex fertilizer, more specific, to establish the optimal parameters for synthesis, as well as the thermal stability and the solubility in water of the product. (Toaso, 2024)
Materials and methods: All chemicals were purchased in pure form. All experiments were performed on standard equipment. Thermogravimetric analysis was recorded on Universal V4.5A TA Instruments. No animals or biological samples were used in research.
Results and Discussion: The zinc-potassium sulfate hexahydrate was prepared by co-crystallization (Morales, 2022) and by neutralization of acid potassium salts with ZnO, as a new method (Toaso, 2024). It was observed that an increase of concentration from 15 to 30% leads to the increase of product yield up to 75%. Thermogravimetric analysis of the double salt reveals the water content and the two dehydration steps in the 100-180^{o}C temperature range. Solubility studies show an almost linear increase of salt solubility in water in the 20-50^{o}C range.
Conclusions: Zinc-potassium sulfate hexahydrate can be obtained in good yields by different methods. The salt is stable bellow 100°C and shows good solubility in water.

Keywords: fertilizer, solubility, zinc-potassium sulfate.

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SESSION 3: FOOD SCIENCE AND TECHNOLOGY

COMPOSITION AND SENSORY ANALYSIS FOR QUALITY EVALUATION SMOKED CHEESE: INFLUENCE OF RIPENING PERIOD

Anamaria BOLBOS[1], Crina Carmen MUREȘAN[1], Romina MARC[1] and Mădălina Oana MARINCAȘ[1]

[1] *Faculty of Food Science and Technology, 3-5 Calea Mănăstur Street, 400372 Cluj-Napoca, Romania;*
[*]Corresponding author, e-mail: anamaria.bolbos@student.usamvcluj.ro

Introduction: The study underscores the complexity of cheese aroma formation and perception, emphasizing that cheese composition (specifically fat, salt, and whey lactose levels) and microbial activity are crucial factors (Mureșan, 2021).
Aims: The descriptive sensory assessment provided a detailed and objective evaluation of the cheese samples, allowing the researchers to characterize how different composition parameters affect aroma compound production, release, and perception during ripening.
Materials and Methods: Descriptive Sensory Analysis.
Results: The study demonstrated that the flavor and texture of smoked cheese improved significantly with storage time due to the metabolic processes occurring during ripening (Andriot, 2024). The use of QDA allowed for a detailed and objective assessment of these changes, highlighting the dynamic nature of flavor and texture development in cheese. The data gathered from sensory evaluations and chemical analyses provide valuable insights for optimizing cheese production and storage practices to enhance sensory attributes and overall product quality.
Conclusion: In the present research work, we demonstrated that the intricate relationship between cheese composition and aroma profile, highlighting the significant roles of fat content, protein, salt, and smoke. Each of these factors contributes uniquely to the microstructure, flavor composition, and release dynamics of aroma compounds during rippening.

Keywords: flavour, sensory profile, smoked cheese, storage period

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FROM FLOWER TO FUNCTION: THE BENEFITS OF POLLEN PROTEIN AND FERMENTATION– AN OVERVIEW

Roxana Anca SĂLĂGEAN[1*] and RAMONA SUHAROSCHI[1,2]

[1]Faculty of Food Science and Technology, University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca, 3-5 Calea Mănăștur, 400372 Cluj-Napoca, Romania
[2]Molecular Nutrition and Proteomics Lab, CDS3, Life Science Institute, University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca, 3-5 Calea Mănăștur, 400372 Cluj-Napoca, Romania
*Corresponding author, e-mail: roxana-anca.cadar@student.usamvcluj.ro

Introduction: Fermentation, an ancient technique used to enhance the nutritional and sensory qualities of food, has been applied to pollen to unlock its full potential. Fermenting pollen can break down complex compounds into more easily digestible forms, and increase the bioavailability of nutrients. The protein content in pollen can vary widely depending on the plant species, but it typically ranges from 7% to 35%, making it a valuable source of plant-based protein. The exploration of pollen protein and the innovative application of pollen fermentation highlight the untapped potential of this natural resource.
Aims: The aim of this study is to provide a comprehensive examination of the current state of research on pollen protein and pollen fermentation, highlighting their nutritional benefits, potential health impacts, and applications in food technology.
Materials and Methods: A clearly outlined protocol was established to direct the study, encompassing search methods, criteria for inclusion and exclusion, and procedures for data extraction. The research encompassed databases like PubMed, Scopus, and Web of Science.
Results: The reviewed studies indicate that both raw and fermented pollen offer significant nutritional benefits and potential health impacts, supporting their use in dietary supplements and functional foods.
Conclusion: The findings emphasize how pollen protein and its fermentation can potentially enhance nutritional intake and offer significant health benefits, including improved digestibility and increased bioactive compound availability.

Keywords: bioactive, fermentation, functional, pollen, protein.

ENSURING THE INNOCUITY OF RAW MILK THROUGH FRAUD DETECTION

Cristina-Maria CANJA[1], Alina MAIER[1], Geronimo Răducu BRĂNESCU[1] and Mirabela Ioana LUPU[1]*

[1]*Faculty of Food and Tourism, Transilvania University of Brașov, România*
*Corresponding author, e-mail: lupu.mirabela@unitbv.ro

Introduction: The innocuity and identifying frauds in raw milk is vital for health, consumer confidence and to prevent the risks associated with the consumption of non-confirmed or falsified dairy products. Milk is source of protein, fat, carbohydrates, vitamins . Milk adulteration is a major problem throughout the around the world. Some specific reasons for milk adulteration may include a large gap between supply and demand, the perishable nature of milk, low purchasing capacity and lack of compatible testing methods for detection of milk fraud (Al Mamun *et al.*, 2021).
Adulterants are compounds that are purposely added to food for technical or commercial purposes, resulting in a loss of nutritional value and contamination, rendering the food hazardous for eating (Patil *et al.*, 2024).
Aims: This paper aims to identify the main methods of adulteration of raw milk and the frequency with which they occur.
Materials and Methods: The study focuses on the determination of cryoscopic point, density, antibiotic content, enzyme tests, DNA identification etc. using standardized working methods.
Results: Of the samples studied, 5 showed deviations in the presence of antibiotics, 7 samples showed deviations from the cryoscopic point standard value and 3 sample contained milk from species other than the declared species.
Conclusion: Identifying fraud in raw milk is essential to ensure the safety of dairy products. The results underline the need for rigorous and continuous controls in collection centers and milk processing plants to prevent the risks associated with the consumption of non-compliant milk. The implementation of advanced food fraud detection and monitoring technologies can significantly contribute to improving the quality and ensuring the safety of raw milk.

Keywords: fraude, innocuity, milk

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ACTOBACILLUS PLANTARUM ADAPTABILITY ON SWEET POTATO SUBSTRATES

Cristina CHIOREAN[1], Adriana PĂUCEAN[2], Carmen POP[2], Rodica SIMA[1], Alexandru APAHIDEAN[1] and Simona CHIȘ[2]

[1]Faculty of Faculty of Horticulture and Business in Rural Development, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania
[2] Faculty of Food Science and Technology, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania
**Corresponding author, email: simona.chis@usamvcluj.ro*

Introduction: Sweet potato (*Ipomoea batatas*), or Batata, is a plant from the *Convolvulaceae* family with root colors ranging from white to orange or purple and with a unique chemical composition, texture, and taste. *Lactobacillus Plantarum* ATCC 8014 is a versatile bacterium with a wide range of applications in food production and human health.
Aims: This research aimed to evaluate the adaptability of the *Lactobacillus Plantarum* ATCC 8014 strain on the fermentation of sweet potato substrates.
Materials and methods: The fermentation process was monitored on three experimental variants: a substrate of 100% yellow sweet potato flour (P1), a substrate of 100% purple sweet potato flour (P2), and a mixed substrate of equal parts of yellow sweet potato flour and type 650 wheat flour (P3). Samples were withdrawn at different fermentation times (0, 12, 24, 48 hours) and pH, total titratable acidity (TTA), and cell growth were measured according to the methods described by (Chiș *et al.,* 2020).
Results: P3 sample showed a more pronounced decrease in pH, indicating faster acidification, and consequently had the highest increase in TTA value, especially noticeable after 12 hours of fermentation. Almost the same trend was observed in P1 and P2 samples. With respect to cells growth, the best adaptability was highlighted by P3 sample.
Conclusions: This research demonstrates that *Lactobacillus Plantarum* ATCC 8014 strain can growth on sweet potato substrates with positive influence on pH and TTA values.

Keywords: fermentations, lactic bacteria, sweet potato

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PROBIOTICS ENHANCE IRON OXIDE NANOPARTICLE ABSORPTION

Călina CIONT (NAGY)[1,2], Raluca Maria POP[3], Alexandru-Flaviu TĂBĂRAN[4], Lucian Barbu-TUDORAN[5], Ramona SUHAROSCHI[1,2], Dan Cristian VODNAR[1] and Oana Lelia POP[1,2*]

[1] Faculty of Food Science and Technology, University of Agricultural Sciences and Veterinary Medicine, 400372, Cluj-Napoca, Romania;
[2] Molecular Nutrition and Proteomics Laboratory, Institute of Life Sciences, University of Agricultural Sciences and Veterinary Medicine, 400372, Cluj-Napoca, Romania;
[3] Department of Pharmacology, Toxicology and Clinical Pharmacology "Iuliu Hatieganu" University of Medicine and Pharmacy, Cluj-Napoca, Romania;
[4] Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine, 400372 Cluj-Napoca, Romania;
[5] Electron Microscopy Center, Faculty of Biology and Geology, Babes-Bolyai University, Clinicilor 5-7, 400006 Cluj-Napoca, Romania;
[*]Corresponding author, e-mail: oana.pop@usamvcluj.ro

Introduction: Recently, newly generated iron oxide nanoparticles (IONPs) carried by probiotics have been recommended as innovative iron supplements due to their low reactivity and high bioavailability compared to conventional anemia treatments (Elshemy, 2018). Due to the probiotic's capacity to connect with the intestinal walls, IONPs-bacteria incorporate into the enterocyte, where nanoparticles are given, providing an adequate iron content.
Aims: The present study aimed to investigate the beneficial effect of IONPs with probiotics (average size 10 nm) as new iron supplements for iron deficiency in anemic rats compared with the conventional treatment ($FeSO_4$).
Materials and Methods: The research included a comprehensive set of tests, including *in vivo* magnetic examination of the various rat tissues following administration of IONPs and IONPs with probiotics. Also, the restoration of healthy levels of blood parameters and iron-related protein expressions were investigated to confirm the efficiency of this material as a new drug for anemia.
Results: The efficiency of IONPs for the treatment of anemia was sensibly higher when nanoparticles were incorporated into the probiotic bacterium *Lactobacillus fermentum* than the conventional treatment ($FeSO_4$). Plasma iron and hemoglobin, intestine expression of divalent metal transporter 1 (DMT1) and duodenal cytochrome B (DcytB), as well as hepatic expression of the hormone hepcidin, was fully restored to healthy levels after administration of IONPs with probiotic.
Conclusion: The collective analysis of results points out that *L. fermentum* is an excellent carrier to overcome the stomach medium and drive IONPs to the intestine, where iron absorption occurs.

Keywords: anemia, iron oxide nanoparticles, microbiota, probiotics

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SENSORY, PHISICOCHEMICAL AND RHEOLOGICAL EFFECTS OF WHITE BREAD FORTIFICATION WITH A COMERCIAL MIXTURE OF VITAMINS AND MINERALS

Carmen-Alexandra CIRICAN[1], Claudia-Felicia OGNEAN[2] and Mihai OGNEAN[2]*

[1] Grewe SA, Veştem, Sibiu, RO
[2] Faculty of Agricultural Sciences, Food Engineering and Environmental Protection, "Lucian Blaga" University of Sibiu, Sibiu, RO
*Corresponding author, e-mail: mihai.ognean@ulbsibiu.ro

Introduction: Modern milling removes the vitamins and minerals from refined flours, but the technological characteristics and sensory appearance is improved (Cauvain and Clark, 2019; Collar *et al*, 2007). Because of that white bread becomes the favourite choice of consumers but this brings little nutrients to them. Bread could be used as vector for delivery of several nutrient to the population (Cardoso *et al,* 2019).
Aims: We conducted this experiment to find how the addition of a commercial mixture of vitamins and minerals could influence the dough's rheology, bread characteristics and sensorial acceptance.
Materials and Methods: Vitamin Calcium Premix FA11095 from DSM Nutritional Products Sp. was used in 2 different dosages for fortification, 1.33 and 2.66 baker's percent. Wheat fibres (JELUCELL WF300) were added too, 0.67 baker's percent. Bread characteristics and nutritional content were analysed according to national standards. Rheological evaluation of dough was done using Mixolab according to method AACC 54-60.01.
Results: The addition of fibres, vitamins and minerals slightly decreased the dough's consistency, had no effects on dough elasticity but increase the stability of dough. Minor rheological effects were observed on C3, C4 and C5. The nutrients were determined in the final products and the lowest dose assured a level of vitamins and mineral at least equivalent to 30% of DZR .
Conclusion: Addition of Vitamin Calcium Premix in 1,3 and 2,6% on flour basis did not affect the bread characteristics, the effects on dough rheology were small and ensured at lower dosage, at least 30% of DZR.

Keywords: breadmaking**,** Mixolab*,* nutrition

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ROMANIAN CONSUMERS PERCEPTIONS, KNOWLEDGE AND EXPECTATIONS OF PSYCHOBIOTICS AND THEIR POTENTIAL IMPACT ON MENTAL HEALTH

Ana-Maria COCEAN[1], Lavinia CĂLINOIU[1], Călina CIONT[1], Adrian MARTĂU[1], Bernadette TELEKY[1], Laura MITREA[1], Bianca ȘTEFĂNESCU, Amalia NEMEȘ[1], Diana PLĂMADĂ[1], Anita VARVARA[1], Răzvan ODOCHEANU[1] and Dan VODNAR[1]*

[1] *Department of Food Science, University of Agricultural Sciences and Veterinary Medicine, 400372, Cluj-Napoca, Romania;*
*Corresponding author, e-mail: dan.vodnar@usamvcluj.ro

Introduction: Psychobiotics, defined as probiotics with potential mental health benefits, have gained attention for their possible role in alleviating symptoms of depression and anxiety. Understanding consumer perceptions and knowledge about psychobiotics is crucial as interest in these products grows. This study explores Romanian consumers' perceptions, knowledge levels, and expectations regarding psychobiotics and their perceived impact on mental health.
Aims: This study investigates Romanian consumers' perceptions, knowledge levels, and expectations regarding psychobiotics, focusing on their understanding of their potential impact on mental health. Additionally, the study seeks to identify the sources from which consumers obtain information about psychobiotics and assess their interest in further learning about these products
Materials and Methods: An online survey was conducted from May to July 2024 using snowball sampling via social media platforms and email distribution lists. The survey consisted of three sections: demographic questions, assessing respondents' knowledge about probiotics and psychobiotics using a 5-point Likert scale, and questions about respondents' experiences with psychobiotics, beliefs in their benefits, and recent mental health symptoms.
Results: Most respondents (82.5%) had moderate to very high familiarity with 'probiotics,' while only 17.5% had low familiarity. In contrast, only 18.4% were moderately to very familiar with 'psychobiotics,' with 57.2% reporting little to no familiarity. This indicates widespread recognition of 'probiotics' but limited awareness of 'psychobiotics' among participants.
Conclusion: This study provides valuable insights into Romanian consumers' perceptions and knowledge regarding psychobiotics and their potential impact on mental health. The findings suggest a growing interest and belief in the benefits of psychobiotics among respondents.

Keywords: Consumer behavior, psychobiotics, evidence, attitude, education

FATTY ACID COMPOSITION OF EGG YOLKS:THEIR NUTRITIONAL VALUE AND HEALTH IMPLICATION

Florina-Dorina COVACIU[1*], Gabriela CRISTEA[1], Veronica FLOARE-AVRAM[1] and Ioana FEHER[1]

National Institute for Research and Development of Isotopic and Molecular Technologies, 67-103 Donat Street, 400293 Cluj-Napoca, Romania
[*]Corresponding author, e-mail: florina.covaciu@itim-cj.ro

Introduction: The composition of fatty acids in our diet plays a crucial role in influencing overall health and well-being. Interest in fatty acid composition of egg yolk stems mainly from the need to find ways to produce healthier food products, i.e. with a higher ratio of polyunsaturated (PUFA) to saturated fatty acids and a more favourable balance between n-6 and n-3 PUFA.
Aim: This study aims to analyze the fatty acid composition of egg yolks, assessing their nutritional value and potential health implications.
Materials and Methods: The egg samples were collected from two distinct hens rearing system: backyard and barn from conventional/industrial production facilities. Fatty acid analysis was conducted using gas chromatography with flame ionization detection (GC-FID).
Results: Backyard eggs contained 29.25% C18:1n9, 13.29% C18:2n6, 0.12% C18:3n6, 0.44% C18:3n3, 2.66% C22:6n3, 50.44% SFAs, 31.81% MUFAs, 17.75% PUFAs and 0.35 PUFAs/SFAs. The SFAs and MUFAs content in barn eggs ranged from 37.53% to 59.10% and from 20.89% to 42.34%, respectively. However, total n-3 PUFAs were lower and n-6 PUFAs higher by approximately 5% than in backyard eggs. The total PUFA content and the PUFA/SFA ratio in the lipids of barn egg yolks were higher than in backyard eggs. The n-6/n-3 PUFA ratio in the backyard egg yolk was approximately two percent lower than in the barn egg yolk (3.49 and 4.65, respectively). This distinction highlights the nutritional benefits of backyard eggs, aligning with recommendations for heart health and chronic disease prevention.
Conclusion: The fatty acid profile highlights the nutritional superiority of backyard eggs over barn eggs, particularly in their lower n-6 polyunsaturated fatty acid content and more favorable n-6 to n-3 PUFA ratio, highlighting the critical role of the hens' diet and living conditions.

Keywords: egg yolk, fatty acid, GC-FID

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WHERE DO THE POTATOES ON THE PLATE COME FROM?

Gabriela CRISTEA[1], Cezara VOICA[1], Ioana FEHER[1], Romulus PUSCAS[1] and Dana Alina MAGDAS[1]

[1]*National Institute for R&D of Isotopic and Molecular Technologies, Cluj-Napoca, Romania*
[*]Corresponding author, e-mail: gabriela.cristea@itim-cj.ro

Introduction: After maize, wheat, and rice, potato represents the fourth-largest crop in the world. The potato (*Solanum tuberosum*) is a staple food source for many people around the world.
Aims: For a better promotion of Romanian products, there is a need to develop new fast and accurate analytical approaches, capable of differentiating the quality and origin of Romanian potatoes.
Materials and Methods: Isotopic Ratio Mass Spectrometry (IRMS) along with Inductively Coupled Plasma - Mass Spectrometry (ICP-MS) represent reliable authentication tools in relation to the geographical origin of a certain food commodity.
Results: The ^{18}O and ^{2}H content of potato water reflects the ^{18}O and ^{2}H fingerprint of the groundwater at the location where the plants grown. Thus, the $\delta^{18}O$ and $\delta^{2}H$ measurements of potato water provide valuable information about the sample origin. The sample having the highest isotopic values of hydrogen and oxygen is a conventional potato, labeled “Egypt”. Elevated values for $\delta^{2}H$ and $\delta^{18}O$ were also obtained for samples originated from Greece, depending on climatic particularities from production area. Regarding the Romanian potatoes, the lowest value was recorded for a sample produced in Eastern Transylvanian region, where the climate is colder and altitude higher (1300 -1400 m above sea level).
Conclusion: Many potato samples were imported from different countries on Romanian market, this fact being confirmed also by the isotopic results for these vegetables. Quantitative contribution of macro-elements represented more than 80% from all minerals. The decrease in concentrations was in the order of K > Mg > P > Ca > Na in potatoes sample. Chemometrics were used to reduce the dimensions of data sets and to reveal hidden characteristic of analyzed samples and the best predictors for geographical differentiation of potatoes samples were $\delta^{13}C$, $\delta^{18}O$ and Sr.

Keywords: elemental profile, isotopic fingerprint, potato

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DISTILLERY BY-PRODUCTS FERMENTATION WITH *LACTOBACILLUS PLANTARUM* STRAIN

Gina-Maria CUCUIET[1], Adriana PĂUCEAN[1], Simona MAN[1], Carmen Rodica POP[1] and Maria-Simona CHIȘ[1]*

[1]*Faculty of Food Science and Technology, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania*
*Corresponding author, e-mail: simona.chis@usamvcluj.ro

Introduction: Food and alcohol production generates significant by-products, particularly in the distillery industry, which produces a large amount of distillery waste containing fruit pulp, seeds, stones, and peels. This waste is rich in non-starch polysaccharides, including both insoluble and soluble fibers. *Lactobacillus plantarum* is known for its adaptability to various environments and its ability to enhance the acidification rate of sourdough.
Aims: The present research aims to study the adaptability of the *Lactobacillus plantarum* 8014 strain to distillery by-product fermentation substrates.
Materials and Methods: The following samples were used: plum distillery waste powder (PDWP), plum distillery waste powder mixed with flour type 480 (PDWPWF) (50:50), quince distillery waste powder (QDWP), and quince distillery waste powder mixed with flour type 480 (QDWPWF) (50-50). The distillery waste substrates were subjected to lactic fermentation with *Lactobacillus plantarum* ATCC 8014 (*Lp*) strain, and samples were withdrawn at 0, 12, 24, and 48 hours of fermentation. These samples were analyzed for pH, total titratable acidity (TTA), and cell growth according to the methods described by Chiș *et al.* (2020).
Results: The sample's pH decreased, but not in a significant way from the statistical point of view (pH PDWP: 3.98-3.21; pH PDWPWF: 3.88-3.63; pH QDWP: 3.32-3.11; pH QDWPWF: 3.45-3.11). The TTA did not exhibit an upward trend, instead displaying oscillatory behavior (TTA PDWP: 29-21.5; TTA PDWPWF: 19.9-12.1; TTA QDWP: 28.57-22.7; TTA QDWPWF: 18.5-13.4). Regarding cellular growth, *Lp* strain did not exhibit optimal growth on the inoculated substrates.
Conclusion: Lp was not able to develop in the byproducts fermented substrates and therefore, further research should be made in order to shed light on by-product distillery fermentation.

Keywords: by-products, distillery, fermentation, *Lactobacillus plantarum,* polysaccharides

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INVESTIGATION OF THE PHENOLIC PROFILE AND ANTIOXIDANT ACTIVITY OF *ACHILLEA MILLEFOLIUM L.* AND *CALENDULA OFFICINALIS L.*

Teodora DAN[1], Katalin SZABO[2] and Sanda ANDREI[1]

[1]*Faculty of Veterinary Medicine,University of Agricultural Sciences and Veterinary Medicine, Cluj-Napoca*
[2]*Faculty of Horticulture,University of Agricultural Sciences and Veterinary Medicine, Cluj-Napoca*
[*]Corresponding author, e-mail: sandrei@usamvcluj.ro

Introduction: *Achillea Millefolium L*. and *Calendula Officinalis L*. are two of the most widespread medicinal plants that possess therapeutic effects which are attributed to their richness in bioactive compounds like phenolics and carotenoids (Vitalini *et. al.*, 2011).
Aims: The aim of this study was to evaluate and compare the total phenolic content as well as the antioxidant activity of four *A. Millefolium* and *C. Officinalis* extract types obtained through green extraction methods.
Materials and Methods: The extracts were obtained by using 1g of air-dried, powdered aerial parts of plant material and 4 different solvents (water, ethanol 70%, ethyl acetate and ethyl lactate). After a 24h maceration in the dark the samples were subjected to ultrasonication. Subsequently, the tubes were centrifuged and the supernatant was collected through filtration. The antioxidant activity of the extracts was determined using the DPPH free radical scavenging capacity technique. The scavenging ability of the extracts against radical anion ABTS was determined according to procedure described by Arnao et al. The phenolic profile of the extracts was analysed using a HPLC Argilent 1200 system.
Results: The extracts prepared with ethanol 70% had significantly higher concentration of phenols than the other solvents (59.932 mg/g for *C. officinalis* and 73.794 mg/g for *A. millefolium*). The lowest amount of the total phenolic contents was detected in the ethyl acetate extracts (0.795 mg/g for *C. Officinalis* and 1.003 mg/g for *A. Millefolium*).
Conclusion: Ethanolic extracts contained the highest concentration of phenolic compounds therefore representing the foundation to future investigations on obtaining a new biomaterial functionalized with biologically active compounds extracted from these two medicinal plants which have curative properties on wound healing.

Keywords: antioxidant, extract, phenols

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AN OVERVIEW OF THE CHEMICAL COMPOSITION AND BIOACTIVITIES OF *VETIVERIA ZIZANIOIDES* (L.) NASH ESSENTIALOIL

Andreea David [1], Anca Fărcaș [1,2], Sonia Ancuța Socaci [1,2*]

[1]*Faculty of Food Science and Technology, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, 3-5 Calea Mănăștur, Cluj-Napoca, 400372, Romania*

[2]*Institute of Life Sciences, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, 3-5 Calea Mănăștur, Cluj-Napoca, 400372, Romania*

[*]Corresponding author, e-mail: sonia.socaci@usamvcluj.ro

Introduction: *Vetiveria zizanioides* (L.) Nash is a perennial plant belonging to the Poaceae family, specifically subfamily Panicoideae. Vetiver essential oil has unique woody odor being prominent ingredient in the perfume and cosmetics industries, and a promising flavoring agent in food industry. Notably, vetiver essential oil and extracts possess various functional properties, including antioxidant, antibacterial, antifungal, and anticancer activities. Additionally, vetiver essential oil is used in ameliorating anxiety, depression, and insomnia.

Aim: The main focus was on the characterisation of vetiver essential oil chemical composition asdetermined by various chromatographic techniques and its pharmacological potential with emphasis on antioxidant, antimicrobial, anti-inflammatory, anticancer, and anxiolytic properties.

Materials and Methods: A literature survey using the Scopus database examined publications from 2003 to 2022. To facilitate a comprehensive overview, we structured the paper around key topics such as the chemical composition of vetiver essential oil, extraction techniques, and itsbioactivities.

Results and Discussion: Vetiver essential oil is a promising natural product with various biological properties, especially with anti-inflammatory potency that requires further and more in-depth investigations. It has been shown that the chemical composition of vetiver essential oil isrelatively complex and needs advanced and suitable analytical techniques.

Conclusions: This review paper summed up some of the most recent topics concerning the complex chemical composition of vetiver root oil, suitable extraction techniques, and several biological properties of vetiver essential oil and extracts as well as their current and future applications. Based on the studied literature, it can be mentioned that vetiver essential oil and extracts are of great interest for the food industry as functional ingredients, that can be exploited as natural source of bioactive compounds. Future research should focus on extraction techniques, chemical characterization, biological activities, and nano-encapsulation to fully explore their potential as functional ingredients.

Keywords: biological properties, chemical composition, extraction techniques, food preservation, vetiver essential oil

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APPLICATION OF HEALTH RISK INDICES TO ASSESS HEAVY METALS CONTAMINATION IN EGG AND PORK MEAT

Adriana DEHELEAN[1*], Gabriela CRISTEA[1], Romulus PUSCAS[1], Dana-Alina MAGDAS[1]

[1]*National Institute for Research and Development of Isotopic and Molecular Technologies, 67-103 Donat Street, 400293 Cluj-Napoca, Romania*
[*]Corresponding author, e-mail: adriana.dehelean@itim-cj.ro

Introduction: In recent decades, food safety has become a significant public concern globally, primarily because food of animal origin is often contaminated by heavy metals and trace elements. These metals are non-biodegradable, toxic, persistent, and capable of accumulating in ecosystems and entering human bodies through the food chain. Due to the severe risks they pose to human health and the environment, heavy metals have garnered substantial scientific attention.
Aims: This study aimed: 1) to determine the concentrations of heavy metals in egg constituents (yolk and albumen) and pork meat cuts (leg, loin and tenderloin) originating from local producers and supermarkets in Romania, and 2) to assess the risk to the health of the population associated with heavy metal intake due to the consumption of eggs and pork meat.
Materials and Methods: Cu, Cr, Pb, Cd and As concentrations were measured in egg yolk (n=29), egg albumen (n=29), and pork meat (leg, n=24; loin, n=18; tenderloin, n=11) using ICP-MS technique. Estimated daily intake of investigated heavy metals, hazard quotient, hazard index and cancer risk were calculated.
Results: Our results showed that estimated daily intake (EDI) levels of Cr, Cu, As, Cd and Pb were significantly lower than provisional tolerable daily intake (PTDI) values established by FAO/WHO. The calculated target hazard quotient (THQ) and hazard index (HI) values were significantly lower than one, indicating minimal non-carcinogenic risks associated with each metal for individuals consuming the tested samples. Furthermore, the target cancer risk (TR) values fell within the recommended guidelines, suggesting that none of the metals analyzed in this study present a carcinogenic risk.
Conclusion: There is no human health risk associated with heavy metals intake due to the consumption of eggs and pork meat from the study area.

Keywords: egg, heavy metals, meat, risk assessment

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SYNTHESIS, PURITY ASSESSMENT AND ANALYTICAL DETERMINATION OF THIOSULFINATES FROM PLANT-BASED SAMPLES

Teodor-Sebastian DOROFTEI[1], Bogdan Marius BOȘCA[1] and Augustin-Cătălin MOȚ[1]*

[1]*Faculty of Chemistry and Chemical Engineering, Babeș-Bolyai University, 11 Arany-János Street, 400028 Cluj-Napoca, Romania*
*Corresponding author, e-mail: teodor.doroftei@stud.ubbcluj.ro

Introduction: Onion (*Allium cepa*) and garlic (*Allium sativum*), cultivated since ancient times, are valued for both their culinary and medicinal uses. Rich in phytonutrients, vitamins, and minerals, they are primarily appreciated for their distinctive flavors, potent antimicrobial properties, and various health benefits. These effects are attributed to thiosulfinates, volatile and unstable sulfur compounds responsible for the strong pungency and flavor of these vegetables. (Lanzotti V., 2006).
Aims: The primary goal of this research paper is to enhance the understanding of thiosulfinate behavior and facilitate their identification among other plant-based samples.
Materials and Methods: As there are no analytical standards available, synthesizing pure thiosulfinates requires careful monitoring of several factors, including temperature and pH. (Lawson L. and Hughes B., 1992). Disulfides react with 30% hydrogen peroxide under acidic conditions and low temperatures for high purity; the reaction is monitored via silica TLC and the products are then washed with dichloromethane and purified with a rotary evaporator. To analyze the thiosulfinates, *Petiveria alliacea* root and garlic samples were crushed with sand and PBS & PLP buffers, centrifuged, and the supernatant was collected, diluted, and prepared for HPLC-DAD.
Results: By analyzing the UV spectrum of each compound, differences in sensitivity between unsaturated R and saturated R thiosulfinates can be detected. High purity compound were obtained, based on the standard peak area ratio. By comparing the chromatograms of garlic and *Petiveria alliacea* with those of the investigated thiosulfinates, several similarities can be observed between the plant-based samples and the compounds of interest.
Conclusion: Exploring these compounds, with a focus on their properties and applications in analytical methods, can aid in the development of new recipes, the enhancement of food products, and the optimization of processing techniques.

Keywords: garlic, *Petiveria alliacea,* thiosulfinate

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WILD MUSHROOMS EVALUATION THROUGH ELEMENTAL PROFILE FOLLOWED BY ADVANCED CHEMOMETRIC APPROACH

Ioana FEHER[1,*], Adriana DEHELEAN[1], Gabriela CRISTEA[1], Veronica FLOARE AVRAM[1], Florina COVACIU[1], Romulus PUSCAS[1] and Dana-Alina MAGDAS[1]

[1] *INCDTIM, 67-103 Donat Street, 400293 Cluj-Napoca, Romania*
[*]Corresponding author, e-mail: ioana.feher@itim-cj.ro

Introduction: Edible mushrooms have been recognized as a highly nutritional food for a long time, due to their specific flavor and texture, as well as their therapeutic effects. From the nutritional point of view, mushrooms represent an important source of proteins, fibers, minerals, and polyunsaturated fatty acids.
Aims: The main aim of the present study consists of multi-elemental evaluation of two wild species of mushrooms (*Boletus edulis* and *Cantharellus cibarius*). The obtained analytical results were further processed by applying different statistical methods.
Materials and Methods: For elemental content, ICP-MS technique, using an Elan DRC(e), Perkin Elmer, mass spectrometer was used. Before conducting the analysis, the mushrooms samples underwent digestion using a combination of nitric acid (HNO_3) and hydrogen peroxide (H_2O_2) in a microwave system. To obtain the ^{13}C isotopic fingerprint of CO_2 resulting from mushrooms, an isotope ratio mass spectrometer (Delta V Advantage), in line with a dual inlet system was used. A liquid-water isotope analyzer (DLT–100, Los Gatos Research) was used to record the isotopic fingerprint of δ^2H and $\delta^{18}O$ from the water previously extracted from mushrooms.
Results: ANOVA analysis highlighted the most powerful parameters for differentiation of the two mushroom species: P (0.016), Zn (0.010), As (0.001), Ag (0.001), Cd (0.001), Hg (0.002) Tl (0.001). For both initial and cross validation stages, linear discriminant analysis (LDA) successfully classified in a proportion of 89.5% the sample set, having as main discrimination markers, the content of Cd, Hg and Be. When artificial neural networks (ANN) were applied even o more precise separation was obtained (94.4%), using the content of C, Ag and Ni.
Conclusion: It was successfully demonstrated the advantages brought by association between analytical techniques and chemometric methods for classification purposes.

Keywords: ANN, chemometric, elemental content, isotopes, mushrooms

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ASSESSMENT OF BISPHENOL A AND HEAVY METALS LEVELS IN COMMERCIAL FRUIT JUICES

Veronica FLOARE-AVRAM[1], Adriana DEHELEAN[1], Ioana FEHER[1*], Florina COVACIU[1] and Dana-Alina MAGDAS[1]

[1]National Institute for Research and Development of Isotopic and Molecular Technologies, 67-103 Donat Street, 400293 Cluj-Napoca, Romania
[*]Corresponding author, e-mail: ioana.feher@itim-cj.ro

Introduction: The presence of contaminants such as Bisphenol A (BPA) and heavy metals (i.e. Pb, Cd, As, Fe, Al, etc.) in fruit juices has raised significant public health concerns. These substances can reach to fruit juices during processing, packaging, and storage, posing potential health risks to consumers.
Aims: In this study, 20 commercial fruit juices packed in different type of bottles (PET, HDPE, PP, C/PAP) present on Romanian market were investigated from BPA and heavy metals (Pb, Cd, As, Zn, Cu, Cr) content point of view.
Materials and Methods: The BPA analysis was performed using an ultra-high performance liquid chromatograph system (Accela UHPLC system, Thermo Scientific, USA) equipped with quaternary pump, autosampler and UV-Vis detector with a photodiode array (PDA). In order to determine the heavy metals concentrations by ICP-MS analysis, a microwave digestion procedure was applied.
Results: A sensitive and accurate UHPLC-PDA method was developed and optimized for the detection and quantification of BPA in fruit juices. Under the optimized conditions, a detection and quantification limit for bisphenol A of 0.036 μg/ml and 0.11 μg/ml respectively and an extraction yield of 84-86% were obtained. We compared the heavy metals content found in our investigated fruit juices with maximum admissible limit established by international organizations.
Conclusion: BPA was not identified in any of the analysed juices samples, suggesting that the use of this compound in food packaging is quite limited and other bisphenols are used instead of BPA. The hazardous properties of BPA have led the industrial use of its analogues, such as: BPB, BPC, BPF and BPS. The concentrations of Zn, Cu and Cr are below the limits imposed by United State Environmental Protection Agency (USEPA) and World Health Organization (WHO). Regarding the current legal regulations on permissible levels of toxic elements, no exceedances were observed.

Keywords: bisphenol A, fruit juices, heavy metals

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INTEGRATED BIOREFINERY FOR RECOVERING VALUABLE BIOMOLECULES FROM FOOD PROCESSING BY-PRODUCTS

Darleen GENUTTIS[1], Ann-Kristin GÄRTNER[1], Sarah ENGELHARDT[1], Alexandru RUSU[1*]

[1]*Strategic Research Department, Biozoon Food Innovations GmbH, Bremerhaven, Germany*
[*]Corresponding author, e-mail: rusu@biozoon.de

Introduction: UP4HEALTH project employs sustainable zero waste processes by valorising by-products from the food industry to meet consumers and industry requirements.
Aims: The project aims to extract four organic, natural, sustainable and healthy ingredients to be integrated into functional food, nutraceutical supplements and cosmetics. This circular economy-based concept aims to close loops and creates a complete cycle to a functional economy system (Jiménez-Lopez *et al*. 2020).
Materials and Methods: Plant-based sources such as olive and grape pomace, olive pits and nuts-by products were used to extract natural fruit water rich in polyphenols, polyphenol-rich dietary fibre, fruit natural oily extracts and Xylo-oligosaccharides (XOS) – a soluble prebiotic fibre that promotes bowel regularity and digestive health.
Results: The obtained ingredients were incorporated and validated in meat matrices, healthy snack bars, drinkable gels, natural functional drinks, olive oil, smoothfood, yoghurts, dietary supplements and further evaluated on their consumer acceptance.
Conclusion: Zero-waste ingredients, produced through innovative processes, serve as innovative raw materials in various applications, enriching products with polyphenols, dietary fibers, oily extracts, and prebiotics, while aligning with the demands of both consumers and industry.

Keywords: by-products, circular economy, grape, olive, nut

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FROM NICHE TO MAINSTREAM – ALTERNATIVE PROTEINS FOR EVERYBODY AND EVERYWHERE

Darleen GENUTTIS[1], Ann-Kristin GÄRTNER[1], Sarah ENGELHARDT[1] and Alexandru RUSU[1*]

[1]*Strategic Research Department, Biozoon Food Innovations GmbH, Bremerhaven, Germany*
[*]Corresponding author, e-mail: rusu@biozoon.de

Introduction: The interest in exploiting alternative sustainable proteins is growing, and therefore requires more in-depth research in utilizing alternatives sources (Di Lena, *et al.,* 2023). Alternative sustainable sources can be divided into plant-based, insects, aquatic organisms and single-cell organisms.
Aims: LIKE-A-PRO project aims to enable seven sustainable proteins from different alternative sustainable sources by planning that all manufacturing steps being accessible, available and acceptable to every population group.
Materials and Methods: By utilizing plant-based, microbe-based, ocean-based, fungus-based insect-based sources, LIKE-A-PRO will enable the mainstreaming of 7 alternative proteins.
Results: Seven different proteins had been obtained from five different based alternative sustainable sources. High proteins contents, acceptable functional and organoleptic properties, and meeting safety requirements will enable novel-food ingredients as applications for human nutrition of all population groups.
Conclusion: LIKE-A-PRO project will transform the protein market and facilitate sustainable and healthy diets by shifting promising alternative proteins and products from niche to mainstream, being fully in line with the ambitions of the EU for the food sector.

Keywords: accessibility, novel-food, protein, sustainable sources

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ASSESSING THE IMPACT OF THERMAL TREATMENT ON BEECHNUT (*FAGUS SYLVATICA* L.) OILS

Alexandra Raluca LAZĂR[1*], Andreea PUȘCAȘ[1], Anda Elena TANISLAV[1] and Vlad MUREȘAN[1]

[1] *Food Engineering Department, Faculty of Food Science and Technology, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, 3-5 Calea Mănăştur Street, 400372 Cluj-Napoca, Romania*

[*]Corresponding author, e-mail: alexandra-raluca.lazar@student.usamvcluj.ro

Introduction: The European beech, also known as *Fagus sylvatica* L., is a tree species considered to be among the most important in the northern hemisphere. Its kernel is a triangular, reddish-brown achene between one and one and a half centimeters. Roasting the seeds prior pressing might induce some changes in oil composition. Cold press extraction is a pressure-based mechanical technology that rapidly extracts oil from various matrices.
Aims: This work aimed to investigate the influence of thermal treatment on beech kernels prior to cold-pressing on the oil extraction yield, primary oxidative state, and acidity.
Materials and Methods: The plant materials used in the present investigation were manually picked from fully grown trees. An extraction technique involving mechanical pressing was carried out utilizing a single screw press. Peroxide levels were determined by titration with sodium thiosulfate, and acidity was assessed employing sodium hydroxide titration.
Results: The extraction yield of the crude beechnut oil (66.73%) was higher than that of the oil that had been thermally treated (48.99%). The oil extracted from the thermal-treated (0.62 ± 0.00 mEq/kg) seeds exhibited a reduced peroxide concentration compared to the raw oil (4.28 ± 0.75 mEq/kg). Crude beechnut oil (5.28% oleic acid) showed a slightly higher acidity compared to the thermally treated beechnut oil (4.72% oleic acid).
Conclusion: Overall, the use of thermal treatment on beech kernels before cold-pressing for oil extraction exerts an influence on the extraction yield, peroxide concentration, and acidity of the resulting oil. The thermally treated oil exhibited a decreased extraction yield, diminished peroxide content, and somewhat reduced acidity compared to the untreated oil. Additional research is needed to explore the oxidative stability of beechnut oils (e.g., during storage, light, and temperature) in terms of primary and secondary oxidation products.

Keywords: beech kernels, cold-pressing, oil yield, oxidative status

A COMPARATIVE ANALYSIS OF HONEY QUALITY BETWEEN COMMERCIAL AND LOCAL PRODUCERS

Mirabela Ioana LUPU[1], Cristina Maria CANJA[1], Alina MAIER[1]* and Vasile PĂDUREANU[1]

[1] *Faculty of Food and Tourism, Transilvania University of Brasov, Romania*
*Corresponding author, e-mail: alina.maier@unitbv.ro

Introduction: Honey, a sweet natural substance, has long been recognized as a significant source of carbohydrates throughout human history (Toniazzo *et al.*, 2023). Additionally, its unique taste and scent, along with its health-promoting components, make it a highly valued product. Based on data from FAO, global honey production exceeds 1.1 million t/a and is raising. This includes honey derived from various nectar sources, including agricultural plants, wild flowers, and forest trees. Because of the high price of the honey, it shows a great interest in falsification. Honey falsification is a pressing concern as advanced falsification technologies continue to emerge. The existing quality standards for honey are often inadequate in identifying most forms of production. That's why honey quality and identity indicators are valuable for detecting potential distortions.
Aims: This study aimed to evaluate the organoleptic, physicochemical and total polyphenols content parameters of honey in its fresh state, from merchants and local producers.
Materials and Methods: The types of honey studied in the experimental research from both commercial and local producers are acacia, rapeseed, sunflower, linden and polyflora honey. The same properties were studied for all types of honey. The following laboratory analyses were performed: moisture content, reducing sugars, total acidity, pH, viscosity, identification of hydroxymethylfurfural (HMF) and total polyphenolic content (TPC).
Results: Following the determinations made on the honey samples, it was found that the honey from local producers has a lower pH and a higher viscosity, a low or absent content of HMF. In commercial honey, the presence of HMF was identified in all samples. Also, the concentration of total polyphenols is higher in the honey from local producers.
Conclusion: In this study, we have shown that the honey from the local producer was better regarding the physicochemical and total polyphenols content parameters.

Keywords: honey, phenolic compounds, quality control

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AN OVERVIEW OF PHYSICOCHEMICAL AND SENSORY EVALUATION OF CHICKEN LIVER PATÉ FORMULATIONS

Alina MAIER[1], Mirabela Ioana LUPU[1*], Cristina Maria CANJA[1], Sorina Denisa UNGUREANU[1] and Vasile PĂDUREANU[1]

[1] *Faculty of Food and Tourism, Transilvania University of Brasov, Romania*
[*]Corresponding author, e-mail: lupu.mirabela@unitbv.ro

Introduction: Liver paté is a traditional and widely consumed meat product that is produced all over the world. Artisan chicken liver paté is a gourmet delicacy that combines the rich, deep flavor of chicken liver with a variety of complementary ingredients to create a smooth, spreadable treat.
Aims: The aim of this work was to produce artisanal chicken liver pâtés in order to obtain healthier ready-to-eat food.
Materials and Methods: We prepared three pâté formulations, varying the chicken liver content (25%, 30% and 35%) and replacing the animal fat with butter, while studying the influence of fat type and liver content on their physicochemical and sensory properties.
Results: The physicochemical characteristics (pH, moisture content, nitrite content, protein content, texture analysis) and sensory analysis of chicken liver patés were studied. All the physicochemical characteristics were influenced by the increase of chicken liver in the formulations: pH decreased (from 6.52 to 6.43), moisture content decreased (from 18.6 to 13.5%), nitrite content decreased (from 4.05 to 3.47 mg/kg), protein content increased (from 14.05 to 15.6 g/100 g.) and the hardest formula was the one with 25% chicken liver.
Students between the ages of 20 and 24 were asked to participate in the sensory panel and complete a questionnaire about how much they liked the chicken liver patties. The nine-item sensory scale included appearance, color, spreadability on bread, flavor, consistency, taste, aftertaste, and overall likeness. Panelists were asked to rank the chicken liver patés based on their personal preferences. The results of the sensory analysis show that the chicken pate with 35% liver received the highest overall liking, followed by the chicken pate with 30% liver and the chicken pate with 25% liver.
Conclusion: In conclusion, chicken liver paté is a valuable food option that meets today's consumer demands for healthy, convenient and sustainable products.

Keywords: chicken liver paté, physicochemical characteristics, sensory analysis

EDIBLE INSECTS - PAST, PRESENT & FUTURE, REVIEW

Arnilva MARA[1], Diana DRAGAN[1], Horia BUNESCU[1], Vasile FLORIAN[1] and Teodora FLORIAN[1]

[1]*Faculty of Agriculture, University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca, Cluj-Napoca, Romania*
[*]Corresponding author, e-mail: diana.poputa@usamvcluj.ro

Introduction: With a growing global population, the demand for food is increasing, while natural resources such as land and water are rapidly depleting. Food security and environmental sustainability represent significant challenges. Under these constraints, there is a growing interest in consuming new and diverse food sources, with edible insects providing a sustainable solution. At least 2 billion people globally consume edible insects in various forms (Van Huis *et al.*, 2013). They are a rich source of energy, protein, PUFA, and various vitamins and minerals.
Further study is needed to examine nutritional and sanitary issues, as both endogenous and exogenous risk factors impact safety concerns. Dossey *et al*. (2019) identify chemical, biological, and allergenic food safety issues, while the European Food Safety Authority notes that health risks vary with insect rearing and processing methods.
To overcome challenges, the insect food industry must evolve by utilizing insect products, educating consumers about their benefits, and incorporating insect-based components into various foods (Van Huis *et al.*, 2016).
Aims: In this article, we address these gaps by exploring the background of edible insects in all their dimensions and applications.
Materials and methods: We conducted a study to assess the various characteristics of edible insects were the Web of Science database, Google Scholar, and Science Direct were accessed. Keywords like "edible insects," "insect nutrition," "insect farming," and "food safety" were used to gather comprehensive data. Furthermore, we examined the references in selected papers to identify relevant research that may have been overlooked during our initial search.
Results: The results highlight the nutritional value and safety concerns of edible insects, comparing their benefits and risks with traditional protein sources while discussing consumer acceptance, regulatory frameworks, and future industry development needed to overcome challenges and promote their sustainable integration into global food systems.
Conclusion: Exploring edible insects as a sustainable food source offers promising solutions to global food security challenges while supporting biodiversity and environmental health.

Keywords: edible insect's benefits, entomophagy, food safety, insect farming, insect nutrition.

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IDENTIFY STRATEGIC CAPABILITIES IN A HALVA PRODUCING FACTORY BY MODELING AND SIMULATION WITH PETRI NETS

Ion Dan MIRONESCU[1*], Ilie BÎRSAN[1,2] and Monica MIRONESCU[1]

[1] Faculty of Agricultural Sciences Food Industry and Environmental Protection, University Lucian Blaga of Sibiu, Romania
[2] S.C. Moara Cibin, Sibiu, Romania
[*]Corresponding author, e-mail: ion.mironescu@ulbsibiu.ro

Introduction: In recent years, the competition in the halva market in Romania has increased. Besides the traditional producers, new competitors came with reduced prices. In order to succeed in maintaining the market share, a decrease in production costs is necessary to maintain product quality.
Aim: The aim of the work is to improve the organization of the production process in the direction of reducing production costs, maintaining the product characteristics and reducing jobs with a high level of effort and which can affect the product quality due to human intervention.
Materials and Methods: In order to identify the possibility of increasing production capacity and decreasing costs, modeling and simulations were carried out using Petri nets with using data from the organization for the inputs and initial state of the simulation. The supplay chain and the flow of materials from raw material to packaging where modelled. The simulation where performed for one week of the operation using stochastic transition to represent the individual operation
Results: The productivity resulted from the simulation matched the productivity of the real line, validating the model. With the help of the simulation, all working times related to each operation and each individual operator were determined, adapted and adjusted, in such a way that they reflect reality. The simulation proves that in two 8-hour production shifts, with the personnel mentioned in the previous rows yield 22,500 pieces of 200g halva i.e. 4,500 kg, which is also proven in reality. Based on the reality, the amount of halva produced, the consumption of raw materials and packaging needed daily, the specific consumption of raw materials and packaging needed to obtain 100 kg of 200g pakageed halva were determined. Based on the model, a scheme was proposed to reorganize the workflow in the factory for streamlining the process.
Conclusion: The purpose of this work, namely, reducing production costs and increasing productivity on the halva production line, was successfully achieved.

Keywords: halva, Petri nets, production, simulation.

SUPERIOR USE OF RESIDUES TO ENLARGE THE RANGE OF FOOD PRODUCTS

Monica MIRONESCU[1*], Roxana-Elena DOSPINA[1], Alexandra-Monica STANCIU[1], and Cornelia DOȘTEȚAN-ABĂLARU[2]

[1] Faculty of Agricultural Sciences Food Industry and Environmental Protection, University Lucian Blaga of Sibiu, Romania
[2] Vitaplant, Săcel, Romania
[*]Corresponding author, e-mail: monica.mironescu@ulbsibiu.ro

Introduction: In many cases, the so-called "residues" or "wastes" resulting from honey processing units are very valuable nutritionally. Although some are partially recovered (like the wax from honeycombs), they can be considered wasted food, and waste is now an ethical and environmental problem, recognized as a growing but avoidable challenge.
Aims: This research aims to find a solution to reduce/eliminate waste resulted in a honey-processing factory through its the superior utilization of the creation of innovative foods with a positive impact on consumer's health.
Materials and Methods: The residue from processing the honey and the products from the hive to obtain various foods was provided by the organization and contained honey, pollen, bee bread, wax, and royal jelly; its physical-chemical, microbiological, and compositional characteristics were determined. In order to reduce wastage, the production of a wafer that includes the residue was tested in the lab. Many recipes and technologies were tested, and sensorial, structural, and microbiological analyses were made.
Results: From all the tested proposals, a recipe, and a technology were chosen based on three criteria: the consumers' acceptance (through sensorial analysis), the technology used, and the structure of the final product, initial and during storage. The technology proposed is simple and does not require the purchase of special equipment or devices if small batches of products are made; a special characteristic of the developed technology is that it is non-thermal so it preserves the valuable components and avoids the formation of toxic compounds. The technology was transferred to the industrial user.
Conclusion: In the present research, we demonstrated that a residue resulted at the processing of beehive can be successfully used for the obtaining of a new type a wafer, which can be produced at the industrial level.

Keywords: beehive, honey, residue, waste, wafer

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GRAPHENE PRODUCED VIA ELECTROCHEMICAL EXFOLIATION IN INSTANT COFFEE AS EFFECTIVE SENSING MATERIAL FOR TRACE DETECTION OF SULFAMETHAZINE

Lidia MĂGERUŞAN[1], Florina POGĂCEAN[1], Stela PRUNEANU[1], Florina-Dorina COVACIU[1*]

[1]*National Institute for Research and Development of Isotopic and Molecular Technologies, 67-103 Donat Street, 400293 Cluj-Napoca, Romania*
[*]Corresponding author, e-mail: florina.covaciu@itim-cj.ro

Introduction: Due to improper usage or the insufficient withdrawal periods, sulfamethazine (SMZ), can persist in the body of treated animals, leading to the presence of significant residual amounts in the products destined for human consumption, posing potential health risks to the consumers (Ronquillo *et al.*, 2017).
Aims: By leveraging the unique properties of graphene and the eco-friendly exfoliation process, the current research targets to develop an efficient sensor platform for environmental and pharmaceutical applications.
Materials and Methods: All materials were of analytical grade and used without further purification. Electrochemical testing was performed with a Potentiostat/Galvanostat PGSTAT-302N (Metrohm-Autolab B.V., Utrecht, The Netherlands) equipment.
Results: The developed synthesis protocol provides the direct production and in-situ co-doping of graphene without the usage of nitrogen or fluoride containing chemical precursors via electrochemical exfoliation of graphite in instant coffee electrolyte solution. The designed sensor exhibits an outstanding responsiveness towards SMZ detection, low detection limits, excellent reproducibility and interference capabilities, providing a clear proof that the exfoliated graphene material can enhance the SMZ detection capabilities
Conclusion: The study successfully demonstrates that graphene produced via electrochemical exfoliation in instant coffee can serve as an effective sensing material for trace detection of SMZ and highlight the potential of green chemistry in advanced sensor technology.

Keywords: graphenes; electrochemical sensing; sulfamethazine

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Acknowledgement: This work was supported by the Ministry of Research, Innovation and Digitization through the 'Nucleu' Program within the National Plan for Research, Development, and Innovation 2022–2027, project number PN 23 24 03 01.

ENHANCED SERS DETECTION OF THIABENDAZOLE IN BENTONITE-FILTERED FROZEN BLUEBERRY EXTRACTS

Csilla MOLNÁR[1]*, Camelia BERGHIAN-GROȘAN[1], Dana Alina MĂGDAȘ[1], Gabriela CRISTEA[1], Adriana DEHELEAN[1] and Simona CÎNTĂ PÎNZARU[2]

[1]National Institute for R&D of Isotopic and Molecular Technologies, Cluj-Napoca, Romania
[2]Ioan Ursu Institute of Physics, Babeş–Bolyai University, Cluj Napoca, Romania
*Corresponding author, e-mail: csilla.molnar@itim-cj.ro

Introduction: Fruits and vegetables, often consumed unprocessed, are treated with plant protection products, making them a primary source of pesticide residues in the human body. *Thiabendazole*, a common fungicide and parasiticide, is frequently found in food products. The Regulation EU stipulates a maximum residue level of thiabendazole (TBZ) permitted 0.01 mg/kg of TBZ in fresh or frozen fruits and vegetables [1]. *Blueberries*, known for their high antioxidant, anthocyanidin, and vitamin content, are considered "superfoods".
Aims: This study aimed to assess the effectiveness of SERS techniques for detecting TBZ in frozen blueberries. The crude extracts from these frozen fruits were analyzed using SERS to identify the characteristic fingerprints of TBZ, and to quantify its levels in artificially treated samples.
Materials and Methods: TBZ was purchased from Sigma-Aldrich (purity ≥ 99%), and the food bentonite (100 g) from a local market was used. The frozen fruits were obtained from popular local market. SERS spectra were recorded using a Confocal Renishaw InVia Reflex.
Results: The method successfully detected TBZ in artificially treated fruits, significantly improving the specificity and performance of TBZ detection in real-world samples. The limit of detection (LOD) achieved was two orders of magnitude lower than the regulatory maximum.
Conclusion: The use of bentonite allowed for a LOD of 0.09 μM in SERS analysis of blueberry extracts. This method enabled TBZ detection at 0.0001 mg/kg in blueberry extracts.

Keywords: bentonite-filtered extracts, blueberries, food safety, SERS, thiabendazole

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Acknowledgments. This work was supported by the MCID through the "Nucleu" Programe, Contract No. 27N/2023, PN 23 24 03 01

DEVELOPMENT OF A QuEChERS METHOD FOR THE SIMULTANEOUS DETERMINATION OF 4 EU PRIORITY POLYCYCLIC AROMATIC HYDROCARBONS BY GC-MS/MS FROM CEREALS

Mioara NEGOIȚĂ[1], Adriana Laura MIHAI[1]*, Alina Cristina ADASCĂLULUI[1] and Laurențiu Mihai PALADE[1]

[1]*National Research & Development Institute for Food Bioresources, IBA Bucharest, 6 Dinu Vintilă Street, District 2, 021102, Bucharest, Romania*
*Corresponding author, e-mail: mihai_laura21@yahoo.com

Introduction: Polycyclic aromatic hydrocarbons (PAHs) are present in the atmosphere, soil, water and a variety of foods. Cereals and cereal-based products are one of the major sources of human exposure to PAHs due to high levels of consumption.
Aims: The aim was to develop and optimize a QuEChERS extraction and purification technique for the simultaneous determination of 4 PAHs: benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(a)pyrene from cereals and cereal-based products.
Materials and Methods: The variability of some factors in the QuEChERS technique (sample amount, QuEChERS salt/sorbent type, freezing time etc.) were investigated in order to increase the extraction efficiency, by eliminating matrix-induced chromatographic effects and obtaining clean final extracts (residues≤ 2 mg co-extract/mL), recoveries between 50-120% and RSD≤15%. The functionality of the optimal QuEChERS protocol was applied to 5 wheat varieties and 16 cereal-based products: flours, breakfast cereal, toast, breadcrumbs, pasta and semolina. Quantitative analysis was performed by GC-MS/MS.
Results: The method was validated "in-house" in terms of linearity, matrix effect (ME), extract stability, precision, recovery, LOD and LOQ. No PAHs were detected in the analysed sample. Good linearities were obtained (R^2>0.99), recoveries of the 4 PAHs ranged between 67-117%, RSD_r varied between 0.19-12.87% and RSD_R between 0.30-13.93% for 1, 2 and 3 ppb. The LOQs ranged between 0.22–0.90 µg/kg, while the ME varied between 0.13-11.95% for the 4 PAHs.
Conclusion: The developed method was suitable for the analysis of 4 PAHs from cereals and their derivatives, meeting the requirements imposed by Regulations (EU) 836/2011 and 2021/808.

Keywords: cereals, cereal-based products, polycyclic aromatic hydrocarbons, PAH, QuEChERS

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ANTIMICROBIAL ACTION MECHANISM AND TOXICOLOGICAL PROFILE OF SOME LAMIACEAE ESSENTIAL OILS AND THEIR CONSTITUENTS

Alina L. NISTOR[1], Carmen R. POP[1], Giorgiana M. CĂTUNESCU[2], Laura COȚ[1]* and Ancuța M. ROTAR[1]

[1] *Faculty of Food Science and Technology, University of Agricultural Science and Veterinary Medicine, Cluj-Napoca Romania*
[2] *Faculty of Agriculture, University of Agricultural Science and Veterinary Medicine, Cluj-Napoca Romania*
*Corresponding author, e-mail: laura.mitrea@usamvcluj.ro

Introduction: Essential oils (EOs) are widely used in food flavourings, pharmaceuticals, agriculture, fragrance, cosmetics, etc. EOs have antimicrobial and insecticidal properties due to their terpenoids and phenolic compounds. Their action mechanisms depend on the type and concentration of these constituents (e.g. linalool, thymol, eugenol, carvacrol, limonene etc.), targeting different germs like Gram+ and Gram- bacteria, yeasts, and moulds. Despite their benefits, EOs may have toxic effects like mutagenicity and genotoxicity, requiring more safety data. A community list of authorized substances is being established with EFSA opinions.
Aims: The focus of the paper is to review the action mechanisms, as well as the toxicity profile of some essential oils from the *Lamiaceae* family and their constituents.
Materials and Methods: The review paper is based on the last 15th years research found in the following databases: Web of Science, Google Scholar, Scopus, PubMed.
Results: EOs target various microbial sites, including the cell wall, membrane, DNA/RNA, and respiratory pathways. They disrupt the cell cycle, inhibit signalling pathways, and permeabilize mitochondrial membranes to induce apoptosis. Most EOs are non-mutagenic/genotoxic, but high doses of monoterpenoid phenols (e.g., carvacrol, thymol) can increase malondialdehyde levels, leading to membrane and DNA damage and induce oxidative stress in some cell lines, like Caco-2 cells. Additionally, α-pinene (from rosemary EO) elevates malondialdehyde levels and antioxidant enzyme activity, while γ-terpinene induces DNA damage in human lymphocytes.
Conclusion: Comprehensive information on antimicrobial mechanisms, impacts on food products, and biological activities of EOs is limited. More research is needed to give effective and safe concentrations, assess genotoxic potential, identify mutagenic components, and construct a comprehensive risk-benefit profile.

Keywords: *Lamiaceae* EOs, antimicrobial action mechanisms, toxicological profile

APPLICATIONS OF *MESPILUS GERMANICA* L. (MEDLAR) IN THE FOOD INDUSTRY

Doru Ion NISTOR[1], Romina Alina MARC[1]* and Crina Carmen MUREȘAN[1]

[1]*Food Engineering Department, Faculty of Food Science and Technology, University of Agricultural Sciences and Veterinary Medicine, 400372 Cluj-Napoca, Romania*
[*]Corresponding author, e-mail: romina.vlaic@usamvcluj.ro

Introduction: *M. germanica,* commonly known as medlar, has many traditional, commercial and medicinal uses. Its fruits can be consumed in various forms: fresh, in the form of vinegar, pickled, boiled, crushed or dried. Ripe fruits of *M. germanica* can be eaten as such or processed into a variety of products, including juice, beverages, sauces, jelly, cheese, jams, and syrup (Nistor *et al.*, 2024).
Aims: The purpose of this work is to present the significant characteristics of *M. germanica* for applicability in the food industry.
Results: Medlar fruits are an excellent source of pectin, which is a natural polysaccharide used as a functional ingredient in the food industry for thickening, increasing viscosity, forming gels, and modifying flavors. Pectin extracted from medlar fruit has a high level of methoxyl pectin and mainly includes: glucose, L-rhamnose, galacturonic acid, -galactose and L-arabinose.
Medlar fruit has a significant tannin concentration of about 3% and produces protein flocculation, which makes it useful for reducing wine turbidity. The oil extracted from the seeds is represented by oleic acid 41% and linoleic acid 43%. Silver nanoparticles produced from *M. germanica* extract have anti-biofilm and antibacterial properties against Klebsiella pneumoniae clinical isolates. Medlar powder increases the overall phenolic profile of confectionery products while improving its antioxidant qualities (Al-Amoudi *et al.*, 2019; Nistor *et al.* 2024).
Conclusion: In the present research, we have shown that *Mespilus germanica* has an increased and unused potential of compounds that can be used successfully in the food industry.

Keywords: antibacterian, fenoli, *Mespilus gemanica,* pectin, taninuri

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RESEARCHES REGARDING OBTAINING BISCUITS WITH IMPROVED NUTRITIONAL CHARACTERISTICS

Vasilica OPRESCU[1], Claudia-Felicia OGNEAN[2] and Mihai OGNEAN[2]*

[1]Moara Cibin SA, Sibiu, RO
[2]Faculty of Agricultural Sciences, Food Engineering and Environmental Protection, "Lucian Blaga" University of Sibiu, Sibiu, RO
*Corresponding author, e-mail: mihai.ognean@ulbsibiu.ro

Introduction: The modern consumers demand high quality products, accessible prices but also are looking for products with improved nutritional characteristics. Some of these nutritional demand are increased fibres content, increased protein content, low sugar and fat content (Sahagun and Gomez, 2018). Improvement of nutritional characteristics of biscuits through addition of different nutrients will influence the sensory characteristics of them (Mieszkowska and Marzec, 2016; Rodriguez-Garcia *et al*, 2022).
Aims: This study focused on the effects of adding fibres and replacing sugar with inulin in the recipe of regular biscuits. Protein fortification of biscuit was also investigated.
Materials and Methods: Dough biscuits was prepared at lab scale and worked and baked on industrial scale production line. Inulin and pea proteins were added to the dough. Sensory characteristics, specific volume, dimensional analysis, colour, pH, reducing and total sugar were performed on the obtained samples. Nutritional value was calculated based on the biscuit' recipe.
Results: Replacing sugar with inulin fibres and addition of pea proteins negatively affected al sensory characteristics but the overall aspect. The colour of biscuits become lighter because sugar replacement. The length, width, height and specific volume of biscuits with modified recipe were smaller than the control. Replacement of sugar with inulin fibres allowed us to obtain biscuits with reduced content of sugar and rich in fibres.
Conclusion: Addition/replacement of sugar with inulin fibres increased the fibres content and reduced the sugar content but the sensory characteristics and physicochemical were reduced. Pea proteins reduced even more the sensorial score of biscuits but the workability of the doughs was not effected very much.

Keywords: fibres, reduced sugar, sensorial

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EXPLOITATION OF ALFALFA SPROUTS AND SEEDS FOR OBTAINING SOURDOUGH BREAD WITH ENHANCED NUTRITIONAL QUALITY

Delia-Elena PĂUȘAN[1], Simona MAN[1], Simona-Maria CHIȘ[1], Carmen Rodica POP[1], Anamaria POP[1], Vlad MUREȘAN[1], Andreea PUȘCAȘ[1], Floricuța RANGA[1], Ersilia ALEXA[2], Anca-Corina FĂRCAȘ[1] and Adriana PĂUCEAN[1*]

[1]Faculty of Food Science and Technology, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania
[2] Faculty of Agro-Food Technologies, University of Life Sciences "King Michael I of Romania," Timişoara, Romania
[*]corresponding author, e-mail: adriana.paucean@usamvcluj.ro

Introduction. Alfalfa seeds and sprouts contain numerous bioactive compounds that have the potential to provide health benefits.
Aims. The research aims to assess the characteristics of sourdough bread fortified with alfalfa seed flour (ASF). Wheat (WF)-alfalfa sprouts flours (ASPF 5,10,15%) were fermented with *Lactobacillus plantarum* ATCC 8014 (*Lp*) and baker's yeast *Saccharomyces cerevisiae* (*Sc*) in single or combined cultures to obtain sourdough samples.
Materials and Methods. Bread samples were obtained from WF type 480, 5% ASF, sourdough, salt, and water. Proximate composition, total amino acids, minerals, glucose, fructose, maltose, total polyphenols (TP), antioxidant activity (AA), and volatiles were determined. Textural and sensorial tests were performed.
Results. ASF and ASPF are highly rich in protein (38.8% and 38.6%), and the bread samples obtained from sourdough containing 15% alfalfa sprouts exhibited the highest protein content (17.38 % - P-DG). An increasing trend was also noted in the total amino acid content, dietary fiber, and mineral content. Glucose was fully metabolized during sourdough fermentation, with only trace amounts being detected in the samples inoculated with *LP+SC* co-culture (P-LDG 5- 0.34, P-LDG 10-0.47, P-LDG 15- 0.64 mg/100 g sample). Also, increased TP and AA (P-DG 15 - 128 mg GAE/100 g, P-DG 15 - 32.73 % RSA). 35 volatile compounds were detected in the bread samples, with 1-butanol, 3-methyl-, and hexanol being particularly notable. The sourdough samples inoculated with *LP* obtained the highest values for hardness, chewiness, and gumminess in the texture test. Based on the sensory analysis, all samples received a score above 5.
Conclusion. Increases in nutritional value have been reported due to the use of ASF and ASPF.

Keywords: alfalfa seeds**,** alfalfa sprouts, bread, *Lactobacillus plantarum, Saccharomyces cerevisiae*

ANTIBACTERIAL POTENTIAL OF A BACTERIAL CELLULOSE-BASED PACKAGING MATERIAL ENRICHED WITH *MENTHA PIPERITA* EXTRACT

Anna PÉTER[1], Ioana M. BODEA[1,2], Bianca POPESCU[1], Dénes-Szilvester MODI[1], Sorin STĂNILĂ[1], Piotr KOCZOŃ[3], Joanna BRYŚ[3], Carmen POP[1], Giorgiana CĂTUNESCU[1] and Ancuța M. ROTAR[1]

[1] *University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania*
[2] *Universidad Politecnica de Catragena, Spain*
[3] *Warsaw University of Life Sciences, Poland*
[*]Corresponding author, e-mail: anna.peter@student.usamvcluj.ro

Introduction: *Mentha piperita* (peppermint) is a well-known herb with high bioactivity. Recently, bacterial cellulose (BC) gained interest due to its applications, including bioactive packaging. Studies indicate that BC enriched with herbal extracts showed antibacterial activity against pathogens.
Aims: According to prior studies, the bioactivity of ethanolic extracts of peppermint was assessed, determining their antibacterial, antioxidant activity (AA), and total phenolic content (TPC). Further, BC pellicles were enriched with peppermint ethanolic extracts and their antibacterial activity was determined against two selected bacteria, *Escherichia coli* and *Listeria monocytogenes*.
Materials and Methods: Peppermint ethanolic extracts were obtained by microwave-assisted extraction using a Box-Behnken experimental design. The antibacterial activity of the extracts was determined using the broth microdilution susceptibility testing. The AA of the extracts was determined using the DPPH assay, and the TPC with the Folin-Ciocalteu method. BC discs were obtained using *Komagataeibacter xylinus* employing the protocol developed by Bodea et al. (2021). The antibacterial activity of the enriched BC discs was determined using the disc diffusion method (Bodea et al., 2022).
Results: The peppermint extracts had high antibacterial activity, AA and TPC. The antibacterial activity of the enriched BC discs against the selected strains varied, as it only showed an inhibitory effect toward *L. monocytogenes*. The inhibitory effect of the enriched BC discs was compared against antibiogram discs enriched with the same extracts. The antibiogram discs were more efficient, having higher antibacterial activity against the two microorganisms, than the enriched BC discs.
Conclusion: While enriched BC discs exhibit antibacterial potential, they are less effective than antibiogram discs.

Keywords: antibacterial activity, bacterial cellulose, *Mentha piperita*, microwave-assisted extraction

ADVANCED BIO-BASED MATERIALS AND PRODUCTS FROM CIRCULAR USES OF SOYBEAN BYPRODUCTS AND WASTE

Steliana RODINO[1,2], Alina BUTU[1] and Marian BUTU[1]

[1] *National Institute of Research and Development for Biological Sciences, Bucharest, Romania*
[2] *Institute of Research for Agriculture Economy and Rural Development, Bucharest, Romania*
[*]Corresponding author, e-mail: alina_butu@yahoo.com

Introduction: Soybean meal is a by-product of the soybean processing industry and offers significant opportunities for the circular development of the food industry. In an active circular process, the vegetal by-products may be valorised by integrating them into nutraceutical formulas based on lipid nanoparticles for the efficient transport and delivery of the bioactive compounds.
Aims: This paper describes the use of soybean meal as a source for the recovery of bioactive compounds as well as the possibility of using it as raw material for producing bioplastics and biofertilizers.
Materials and Methods: The technologies applicable for which soybean meal can be processed and value-added, including the net gain toward economic efficiency and reduction of agro-industrial wastes, were overviewed. Along with the nutritional benefits that could arise from using soybean meal in food products and how they could contribute to food security, the reduction of the dependence on non-renewable resources was also investigated.
Results: Several of the technologies that were identified in this study for the processing of soybean by-products related to the extraction methods of bioactive compounds include advanced solvent extraction, supercritical fluid extraction, and enzymatic hydrolysis, each of which demonstrated varying degrees of efficiency in isolating and preserving the bioactivity of the target compounds.
On the other hand, the conversion of soybean meal into bioplastics and biofertilizers exhibits attractive material properties that are industrially suitable.
Conclusion: The implementation of innovative technologies for the exploitation of soybean by-products has a good potential for building upon the food industry's sustainable development through the recovery of their bioactive compounds and production of bioplastics and biofertilizers for food security objectives.

Keywords: bioactive compounds, biofertilizers, circular economy, nutraceuticals, vegetal by-products

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INFLUENCE OF *LEUCONOSTOC CITREUM* DSM 5577 SOURDOUGH ON SUGAR-FREE MUFFINS QUALITY

Maria-Florina ROȘCA[1], Simona Maria MAN[1], Maria Simona CHIȘ[1], Carmen R. POP[1], Andreea PUȘCAȘ[1], Laura STAN[1], Anca C. FĂRCAȘ[1], Florica RANGA[1], Anda TANISLAV[1] and Adriana PĂUCEAN[1]*

[1]*Faculty of Food Science and Technology, University of Agricultural Sciences and Veterinary Medicine, Cluj-Napoca*
*Corresponding author, e-mail: adriana.paucean@usamvcluj.ro

Introduction: *Leuconostoc citreum* DSM 5577 is a heterofermentative bacteria capable of producing mannitol, lactic acid, acetic acid, CO_2, and aromatic compounds. Mannitol is a low-calorie sugar alternative suitable for those following low-sugar diets.
Aims: The purpose of this study is to evaluate the influence of *Leuconostoc citreum* DSM 5577`s sourdough on the quality characteristics of sugar-free muffins.
Materials and Methods: Sourdough was prepared by adding 10% fructose to a mix of wheat flour and water (1:1) and *Leuconostoc citreum* DSM 5577 (10^8 cfu/ml) cultivated on MRS broth at 30◦C. Samples collected at 0, 24, and 30 hours of fermentation were analyzed for microbiological, physico-chemical, and rheological features. Muffins were obtained by adding 15, 20 and 25% sourdough to a batter formed from wheat flour, coconut oil, eggs, and baking powder. Muffins samples were analysed for physico-chemical and sensorial characteristics.
Results: The results obtained from the physico-chemical and sensory analyses showed that the addition of sourdough did not significantly affect the crumb color of the muffins. However, a larger amount of sourdough slightly changed the texture of the muffins. Regarding the carbohydrate content, the highest values were obtained after 30 hours of fermentation. The more sourdough in the muffins, the higher the mannitol content; this increased in direct proportion with fermentation time, from 0.052 mg/g to 1.236 mg/g. Maltose also varied from 12.59 mg/g in the control sample to 25.55 mg/g, while the values obtained for organic acids did not show major differences between the samples. Following the sensory analysis results, the tasters considered that the sourdough muffins were acceptable for consumption
Conclusion: The addition of sourdough did not significantly impact the quality of the muffins compared to the control sample, and the results indicated that the products could be accepted by consumers.

Keywords: *Leuconostoc citreum* DSM 5577, mannitol, muffins, sugar-free

FROM FLOWER TO FUNCTION: THE BENEFITS OF POLLEN PROTEIN AND FERMENTATION– AN OVERVIEW

Roxana Anca SĂLĂGEAN[1*] and RAMONA SUHAROSCHI[1,2]

[1]Faculty of Food Science and Technology, University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca, 3-5 Calea Mănăștur, 400372 Cluj-Napoca, Romania
[2]Molecular Nutrition and Proteomics Lab, CDS3, Life Science Institute, University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca, 3-5 Calea Mănăștur, 400372 Cluj-Napoca, Romania
*Corresponding author, e-mail: roxana-anca.cadar@student.usamvcluj.ro

Introduction: Fermentation, an ancient technique used to enhance the nutritional and sensory qualities of food, has been applied to pollen to unlock its full potential. Fermenting pollen can break down complex compounds into more easily digestible forms, and increase the bioavailability of nutrients. The protein content in pollen can vary widely depending on the plant species, but it typically ranges from 7% to 35%, making it a valuable source of plant-based protein. The exploration of pollen protein and the innovative application of pollen fermentation highlight the untapped potential of this natural resource.
Aims: The aim of this study is to provide a comprehensive examination of the current state of research on pollen protein and pollen fermentation, highlighting their nutritional benefits, potential health impacts, and applications in food technology.
Materials and Methods: A clearly outlined protocol was established to direct the study, encompassing search methods, criteria for inclusion and exclusion, and procedures for data extraction. The research encompassed databases like PubMed, Scopus, and Web of Science.
Results: The reviewed studies indicate that both raw and fermented pollen offer significant nutritional benefits and potential health impacts, supporting their use in dietary supplements and functional foods.
Conclusion: The findings emphasize how pollen protein and its fermentation can potentially enhance nutritional intake and offer significant health benefits, including improved digestibility and increased bioactive compound availability.

Keywords: bioactive, fermentation, functional, pollen, probiotics

A REVIEW OF THE CYTOTOXIC PROPERTIES OF *SORBUS AUCUPARIA* L.

Giorgiana A. SPALLER[1]*, Romina A. MARC (VLAIC)[1] and Crina C. MUREȘAN[1]

[1]*Faculty of Food Science and Technology, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, 3-5 Mănăştur St., 400372 Cluj-Napoca, Romania*
*Corresponding author, e-mail: spallergio@gmail.com

Introduction: Considering advances in diagnosis and treatment, cancer is an ongoing global health issue. The extreme side effects and increasing resistance to traditional chemotherapy highlight the critical need for new, safer treatment options. The significant polyphenolic and bioactive content of natural substances, specifically those derived from herbal remedies like *S. aucuparia* L, has prompted widespread interest in their potential anticancer activities (Sołtys *et.al.*, 2020).
Aims: The purpose of this review is to collect current evidence on the cytotoxic and therapeutic activities of *S. aucuparia* extract.
Material and Methods: During our investigation of the cytotoxic effects of *Sorbus aucuparia* L., we extensively searched several databases, including Google Scholar, Web of Science, and Scilit. This research was run with a variety of relevant keywords to ensure an accurate assessment of the available literature.
Results: The extracts are highly effective against cancer cell lines like HepG2, Caco-2, A549, and HeLa. Acetone extracts rich in polyphenols and anthocyanins exhibit the highest activity. Furthermore, these extracts enhance chemotherapeutic efficiency, and ameliorate doxorubicin-related side effects like as anaemia (Bozkurt-Guzel *et. al.*,2018; Qi *et. al.*, 2022)
Conclusion: Sorbus aucuparia extracts have significant anticancer characteristics due to their cytotoxic effects and ability to complement current treatments. More study is needed to better understand the mechanisms of action and develop standardised pharmaceutical extracts.

Keywords: *Sorbus aucuparia*, polyphenols, cytotoxicity

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ANTIOXIDANT PROPERTIES OF ICARISIDE II COMPLEXES

Róbert SZABÓ[1], Csaba PÁL RÁCZ[2] and Vasile Francisc DULF[1]*

[1] *Department of Environmental and Plant Protection, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania*
[2] *Faculty of Chemistry and Chemical Engineering, Babeș-Bolyai University of Cluj-Napoca, Romania*
*Corresponding author, e-mail: francisc.dulf@usamvcluj.ro

Introduction: Icariside II, known as Baohuoside I, acts as the main pharmacological metabolite originating from icariin, the key active component present in the plant species *Herba Epimedii sp.*. He *et al.* (2020) reported that ICS has been utilized in the treatment and prevention of various health conditions, including cardiovascular diseases, osteoporosis, sexual dysfunction, etc. Additionally, ICS demonstrated its antioxidant properties through the efficient reduction of reactive oxygen species. Moreover, it boosts the functions of antioxidant enzymes, showcasing its impressive capability to counteract oxidative stress.
Aims: Examination how the complexation procedure effects the antioxidant properties of the ICS II. The antioxidant capabilities of pure icariside II (ICS), icariside II whey protein concentrate complex (ICS-WPC), and surfactant-based icariside II whey protein complexes (S-ICS-WPC) were studied.
Materials and Methods: The Icariin II was purchased from Xi'an Day Natural Inc (China), and the whey protein mixture from Koliba Trade (Slo.), Tween 80 and lecithin were of analytical grade. The evaluation utilized the Briggs-Rauscher oscillating system and the 1,1-diphenyl-2-picrylhydrazyl (DPPH·) radical scavenging assay, the latter of which offered a quantitative assessment of antioxidant potential.
Results: The process of complexation effectively enhanced the antioxidant properties of ICS. Moreover, the incorporation of different surfactants like Tween 80 and lecithin into the ICS-WPC complex resulted in notable additional improvements.
Conclusion: The BR method revealed that orally administered pure ICS would not exhibit antioxidant effects in the human body. The DPPH method showed that the final product, 2-1-3-3 ICS-WPC-Tween 80-Lecithin, had the most significant improvement, with a remarkable 4.16-fold increase in antioxidant activity compared to pure ICS.

Keywords: antioxidants, icariside II, lecithin, Tween80, whey protein

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ENHANCING ITACONIC ACID PRODUCTION FROM AGRO-INDUSTRIAL WASTE: ENZYME-DRIVEN BIOSYNTHESIS STRATEGIES

Bernadette TELEKY[1], Laura MITREA[1], Amalia NEMEȘ[1], Diana PLĂMADĂ[1], Mihaela PĂȘCUȚĂ[1], Lavinia CĂLINOIU[1], Anita VARVARA[1], Bianca ȘTEFĂNESCU[1], Ana-Maria COCEAN[1], Adrian MARTĂU[1], Elemer SIMON[1], Paula PLOSCA[1], Răzvan ODOCHEANU[1] and Dan VODNAR[1]*

[1]*Faculty of Food Science and Technology, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania*
[*]Corresponding author, e-mail: dan.vodnar@usamvcluj.ro

Introduction: The pursuit of sustainable itaconic acid (IA) production from agricultural residues, particularly wheat bran, has garnered significant interest. This research focuses on optimizing IA production efficiency while minimizing environmental impact through synergistic solid-state fermentation (SsF), hydrolysis, and submerged fermentation processes.
Aims: The study explores the metabolic adaptability of *Aspergillus* species, notably *A. terreus*, showcasing their versatility in sustainable biotechnological applications.
Materials and Methods: Meticulous optimization of moisture content, pH levels, total reducing sugar concentration, inoculum size, and humidity is conducted to maximize enzyme and IA yields.
Results: Optimal conditions are identified, including 80% moisture on the third day, crucial for efficient enzyme production, highlighting moisture's pivotal role in synthesis dynamics. IA production optimization at varying initial pH levels (3, 4, and 5) reveals pH 5 as optimal, yielding 10.78 ± 0.98 g/L by day 7. Cost implications present *A. awamori* as *a* cost-effective enzyme producer, reducing overall production costs and minimizing undesirable by-products. Insights into substrate moisture, enzyme activities, and IA production dynamics provide a foundational understanding for scaling up IA production via eco-friendly processes. A mass balance calculation confirms an efficient 28% IA yield from glucose.
Conclusion: This research introduces innovative strategies for sustainable and eco-friendly IA production, emphasizing the potential of SsF within the circular economy framework. By harnessing microbial metabolisms and agricultural residues, the study enhances IA synthesis efficiency, promoting an environmentally conscious and resource-efficient chemical industry.

Keywords: *Aspergillus* sp., bio-based, circular economy, enzymes, fermentation

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DEVELOPMENT OF MULTIFUNCTIONAL RHENIUM AND IRIDIUM FLAVONOID COMPLEXES AS NOVEL METALLODRUGS AND CATALYSTS FOR ENHANCED ANTICANCER THERAPY

Monica TRIF[1*], Jörg SCHACHNER[2], Hristina HRISTOVA[3], Maria João G. FERREIRA[4], Cláudia Alexandra Carica Figueira[4], Ljiljana MIHAJLOVIĆ-LALIĆ[5], Milan MILOVANOVIĆ[5] and Stefan NIKOLIĆ[5]

[1]Centre for innovative process engineering (CENTIV) GmbH, Germany
[2] Department of Inorganic Chemistry, Institute of Chemistry, University of Graz, Austria
[3] Venus Roses Labsolutions Ltd., Bulgaria
[4] Centro de Química Estrutural, Institute of Molecular Sciences Instituto Superior Técnico, Universidade de Lisboa, Lisboa, Portugal
[5] Innovative Centre Faculty of Chemistry Belgrade Ltd., Serbia
[*]Corresponding author, e-mail: mt@centiv.de , ljiljanam@chem.bg.ac.rs

Introduction: Flavonoids are polyphenolic compounds found in plants known for their antioxidant, anti-inflammatory, and anticancer properties.
Aims: Rhenium and Iridium complexes have shown significant potential in medicinal chemistry due to their unique structural, electronic, and catalytic properties, which can improve the pharmacokinetic and pharmacodynamic profiles of drugs.
Material and Methods: By complexing flavonoids with rhenium and iridium, the aim in MET-EFFECT project is to create multifunctional metallodrugs that combine the bioactive properties of flavonoids, potentially enhancing anticancer activity, with the metal's catalytic capabilities.
Results: It is expected that the formation of metal-flavonoid complexes will improve the solubility and stability of flavonoids, enhancing their bioavailability. The use of metal complexes allows for the design of targeted delivery systems, where metal properties can be fine-tuned to improve selectivity toward cancer cells.
Conclusion: The development of rhenium and iridium flavonoid complexes represents a promising concept for the creation of novel metallodrugs with dual functionality as anticancer agents and catalysts. This approach aims to combine the strengths of natural products and transition metal chemistry, potentially leading to breakthroughs in cancer treatment strategies.

Keywords: anticancer activity, delivery system, flavonoids, formulation, metal-flavonoid Complex

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UNLOCKING THE POWER OF LUPINE: A SUSTAINABLE PROTEIN SOURCE FOR FUTURE FOODS

Alexandru RUSU[1], Ann-Kristin GÄRTNER[1], Malte BETHKE[2], Darleen GENUTTIS[1], Sarah ENGELHARDT[1] and Monica TRIF[2]*

[1] Strategic Research Department, Biozoon Food Innovations GmbH, Bremerhaven, Germany
[2] Food Research Department, Centre for Innovative Process Engineering GmbH, Food Research Department, Syke, Germany
*Corresponding author, e-mail: mt@centiv.de

Introduction: Lupine, also known as lupin, is emerging as a promising alternative protein source for food products due to its high protein content, nutritional benefits, and sustainability (Verstringe *et al.,* 2023).
Aims: In ALEHOOP EU project one of the objectives has been to develop an optimised legume-based biorefinery for obtaining proteins from lupine (*Lupinus albus*) by-products to reach maximum yields of protein extraction at lab scale in terms of quantity and quality.
Materials and Methods: ALEHOOP Lupin Protein Isolate (LPI) obtained has been analysed for it nutritional composition: protein content, total carbohydrates, total fat, ash (Jiménez-González *et al*. 2024).
Results: LPI is high in dietary fiber, low in carbohydrates, has high protein content (71 to 73%) and a well-balanced amino acid profile, and an energy value 443 kcal/100g. It is naturally gluten-free, making it an excellent option for people with celiac disease or gluten sensitivity
Conclusion: Incorporating LPI as an alternative protein source is addressing the growing demand for sustainable and nutritious food products while providing consumers with a diverse range of dietary options.

Keywords: lupine, nutritional benefit, protein isolate, sustainable source

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PARTIAL SUBSTITUTION OF PORK FAT WITH BEESWAX OLEOGELS FOR IMPROVING THE NUTRITIONAL VALUE OF DRY FERMENTED SAUSAGES

Simona PERȚA-CRIȘAN[1], Florentina-Daniela MUNTEANU[1], Iolanda TOLAN[1], Bianca-Denisa CHEREJI[1], Dumitru CONDRAT[1], Lucian COPOLOVICI[1] and Claudiu-Ștefan URSACHI[1]*

[1] *Faculty of Food Engineering, Tourism and Environmental Protection, "Aurel Vlaicu" University of Arad, Romania*
*Corresponding author, e-mail: claudiu.ursachi@uav.ro

Introduction: The composition of dry fermented sausages (DFS) includes pork fat characterized by a high content of saturated fatty acids (SFA). It is recognized that consumption of foods rich in SFA is associated with some health risks. In recent years, a challenge for meat industry has been to develop new meat products with reduced saturated fat and improved polyunsaturated fatty acid (PUFA) content.
Aims: Investigating the suitability of beeswax (BW) oleogels based on pumpkin seed oil (PO) and rapeseed oil (RO) as fat replacers in developing healthier DFS.
Materials and Methods: PO and RO, pork meat and back fat were purchased from local market, BW and reagents from Sigma Aldrich (Germany). Oleogels preparation: PO and PO:RO 3:1 mixture were heated at 65°C with 10% BW, until dissolution. Different DFS were formulated: C (control); P-30, P-60, PR-30 and PR-60, where 30% or 60% of pork fat was replaced by PO or PO/RO oleogels. Physicochemical properties, sensory acceptability and nutritional values of DFS were determined.
Results: P-60 and PR-60 showed higher moisture content than C. Fat replacement did not disturb microbial activity, with the final pH for all samples ranging between 5.15 and 5.23. The texture profile indicated significant differences in DFS texture depending on the quantity and type of oil. The TBAR for all samples was below the minimum required to detect unacceptable flavors. The reformulated samples showed a decreased SFA and a higher PUFA content, exceeding the acceptability limit in sensory analysis but with lower hedonic scores than C.
Conclusion: The results indicated that P-30 and PR-30 oleogels are the most suitable for reformulation due to the appropriate physicochemical properties, sensory acceptability, and improved nutritional value of developed DFS.

Keywords: dry fermented sausage, oleogel, pumpkin seed oil, rapeseed oil

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INVESTIGATING THE MECHANISM OF MAGNESIUM UPTAKE IN *LACTOBACILLUS RHAMNOSUS*

Rodica-Anita VARVARA[1,2], Ana-Maria COCEAN[1], Lavinia CĂLINOIU[1], Călina CIONT[1], Adrian MARTĂU[1] , Bernadette TELEKY[1] , Laura MITREA[1], Bianca ȘTEFĂNESCU, Amalia NEMEȘ[1], Diana PLĂMADĂ[1], Răzvan ODOCHEANU[1], Heike BUDDE[2], Ruth LEY[2] and Dan VODNAR[1]*

[1] *Department of Food Science, University of Agricultural Sciences and Veterinary Medicine, 400372, Cluj-Napoca, Romania;*
[2] *Department of Microbiome Science, Max Planck Institute for Biology, 72076 Tübingen, Germany;*
*Corresponding author, e-mail: dan.vodnar@usamvcluj.ro

Introduction: Magnesium is essential for human health, playing a critical role in over 300 enzymatic reactions, including protein synthesis, blood pressure regulation, and muscle and nerve function. Probiotics, beneficial microorganisms in the human gut, were recently associated with mineral metabolism. Despite extensive research on both magnesium and probiotics, the interaction and synergistic effects between magnesium supplementation and probiotic efficacy remain insufficiently explored.
Aims: Our primary goal was to explore the role of *Lactobacillus rhamnosus* as a potential magnesium internalizer. This enhances our understanding of how bacteria influence magnesium bioaccessibility and contribute to human mineral homeostasis.
Materials and Methods: Using $MgSO_4$ as a magnesium source, we assessed the bacteria's ability to uptake and internalize magnesium. *L. rhamnosus* cultures were grown in media supplemented with $MgSO_4$ at varying concentrations to determine the optimal conditions for magnesium uptake.
Results: Electron Microscopy provided insights into surface morphology and revealed detailed internal cellular structures, such as cell wall integrity and intracellular accumulation. By comparing structural differences between cells grown with and without $MgSO_4$, we aimed to elucidate how magnesium influences the physical and structural properties of *L. rhamnosus* and evaluate its capacity for magnesium uptake and internalization.
Conclusion: Our findings indicate that *L. rhamnosus* can effectively uptake magnesium, with visible changes in cell structure observed. This study contributes to a deeper understanding of the interplay between magnesium and probiotics within the context of nutribiotics, paving the way for improved dietary supplements and therapeutic strategies.

Keywords: *Lactobacillus rhamnosus*, mineral bioaccessibility, nutribiotics.

ASSESSMENT OF ELEMENTAL DETERMINATION OF EGG-SHELL

Cezara VOICA[1], Gabriela CRISTEA[1] and Ioana FEHER[1]

[1]*National Institute for R&D of Isotopic and Molecular Technologies, Cluj-Napoca, Romania*
[*]Corresponding author, e-mail: cezara.voica@itim-cj.ro

Introduction: Egg is a food product of high nutritional quality, extensively consumed worldwide. However, with an increase in the production of eggs by more than 150% in the past three decades, the resulting eggshell waste, which typically goes to landfills, poses serious hazards of environmental pollution and health. It can be used as a valuable product, an attractive source of calcium for human nutrition, which could alleviate its environmental burden.
Aims: Determination of the trace elements in egg shells is of great significance for identifying the type of eggs as function of hens growing regime and evaluating them quality, related to the water and feed consumed by poultry. The information's of trace elements content, fraction and distribution on the egg shell could constitute a "fingerprint" for egg.
Materials and Methods: Five essential elements, heavy metals, and trace element concentrations were measured in a total set of 60 eggshell samples, comprising domestic (home-produced) and commercial eggs, for comparative purposes. An ICP-MS spectrometer (Perkin Elmer ELAN DRC-e) was used for all elemental measurements.
Results: There is a trend of mean concentrations in order Ca>Mg>Na>P>K for eggshell samples. The high average level of Mg (1.569 g/kg) in home eggshells could be due to the various food hens feeding regimes. The high concentration of P in market egg shells may be due to the corn and soybean meal diets of hens, and that of home eggs may be due to whole grains such as millet, whole-wheat bread, rice, and maize. Regarding the entire data set, the mean concentration of heavy metals was (in mg/kg): 3.79 (Al), 0.18 (Mn), 0.33 (Co), 3.74 (Cu), 1.14 (Zn), 10.75 (Cr).
Conclusion: This study aimed to provide information on the elemental composition in eggshells from Romanian market eggs. All egg-shell samples analysed are free of risk of health hazards, and their concentration is tolerable according legislation.

Keywords: egg-shell, ICP-MS, metals

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ASSESSMENT OF ELEMENTAL DETERMINATION OF SPRING WATERS

Cezara VOICA[1] and Gabriela CRISTEA[1]

[1]*National Institute for R&D of Isotopic and Molecular Technologies, Cluj-Napoca, Romania*
[*]Corresponding author, e-mail: cezara.voica@itim-cj.ro

Introduction: In Romania, the consumption of water from springs is a common practice, driven by multiple factors. The low availability of public water systems, particularly in rural areas, cultural habits, odor and taste of tap water, and the perception of springs as a natural, therapeutic, and free resource contribute to this phenomenon. However, it does not mean that all waters are 100% healthy.
Aims: Spring mineral water might have the properties favourable to health, which should be assessed by different analyses. Owing to the paramount interest and the growing recent use of drinking mineral waters, a need for a rigorous scientific approach arises. The therapeutic action of drinking mineral waters has been demonstrated to have important biochemical implications.
Materials and Methods: Analyses for total concentrations of macro minerals (Ca, Mg, Na, K) and oligo-elements (Al, Cr, Mn, Fe, Co, Ni, Cu, Zn, Ba, Sr, V) were carried out by inductively coupled plasma quadrupole mass spectrometry.
Results: The mean concentrations of macro elements were (mg/L): 19.607 for Mg, 1.43 for K, and 33.613 for Ca. According to the EU classification (80/778/EEC and 2003/40/EC), all the waters contained <150 mg/L Ca and 3% of these may be classified as "containing magnesium" and 8% as "containing sodium". From the analyzed water samples, 76% were "suitable for low sodium diets". The concentrations range of studied elements was (in μg/L): < 0.22-70.17 (Al); 0.36-24.31 (Cr); <0.001-20.06 (Mn); < 0.001–158.67 (Fe); 0.001-0.21 (Co); 0.001-3.14 (Ni); 0.001–5.79 (Cu); 0.001–20.92 (Zn).
Conclusion: The chemical quality (major constituents and trace elements) of the studied spring waters was variable, which possibly depends on many factors such as natural environment (geological setting, climate, topography, etc.) and the source water composition, The results may be useful for improving the current legislation on potable waters, and also for guiding the consumers in the choice of different waters.

Keywords: spring waters, ICP-MS, metals

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SESSION 4 HORTICULTURE

DEVELOPMENT OF NOVEL FOOD PRODUCTS BASED ON QUINOA

Eftychios APOSTOLIDIS[1,2], Panteleimon STAVROPOULOS[1], Antonios Mavroeidis[1], Ioanna MANDALA, Dimitrios BILALIS[2] and Ioanna KAKABOUKI[1]*

[1] *Faculty of Crop Science, Agricultural University of Athens, Greece*
[2] *Faculty of Food Science & Human Nutrition, Agricultural University of Athens, Greece*
*Corresponding author, e-mail: i.kakabouki@aua.gr

Introduction: Quinoa (*Chenopodium quinoa* Willd.), a versatile pseudocereal, thrives across diverse climatic conditions and holds immense promise (Kakabouki *et al*., 2015). Since its first introduction to Greek agriculture in 1995, quinoa has been cultivated for its adaptability to the Mediterranean climate, offering a highly nutritious and versatile food source, including high protein and fiber content and gluten-free composition (Bilalis *et al*., 2019). The growing demand for natural foods places quinoa as a prime candidate for direct consumption, while the rising interest in functional foods facilitates its incorporation into food matrices, such as flour for different uses (Flórez-Martínez *et al*., 2024).
Aims: The objective of this project was the evaluation of quinoa seeds aiming at the production of extruded pasta and pasta from whole grain quinoa flour. Our approach includes the total substitution of different flours by quinoa flour to evaluate its effect on their mechanical and optical characteristics.
Materials and Methods: Quinoa seeds were cleaned to remove saponins and ground in a laboratory-scale mill, and the resulting quinoa whole flour was evaluated for its suitability for pasta and biscuit making at different levels of substitutions. The final products were analyzed for their mechanical, nutritional and optical characteristics.
Results: The use of quinoa flour in pasta and biscuits offers significant nutritional advantages, improving the quality and health value of the final products. In pasta and biscuit, the use of quinoa flour results in products rich in protein and fiber, while maintaining a pleasant texture.
Conclusion: Quinoa is a promising raw material for the preparation of gluten-free products, like pasta and biscuits, and with new formulations and processing strategies, their functional and nutritional properties could be balanced even better.

Keywords: food development, mechanical properties, uinoa

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ON THE WAY OF IDENTIFYING *METHYLOBACTERIUM* SPECIES SYMBIOTIC TO SUNFLOWER

Adriana AURORI*, Rodica POP and Cristian Radu SISEA

Faculty of Horticulture and Business for Rural Development,
University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania
*Corresponding author, e-mail: adriana.aurori@usamvcluj.ro

Introduction: Finding solutions for sustainable farming remains a continuous challenge. Consequently, the identification of natural resources that contribute to plant protection and efficient growth is a priority. Sunflower (*Helianthus* spp.) is known to host a diverse community of *Methylobacterium* species, which reside not only in the rhizosphere, but also on the aerial parts of the plant. These phytosymbionts efficiently uptake methanol released by the plant and utilize it as a carbon source (Kutschera, 2007). In return, the bacteria can benefit the plant by contributing to nitrogen fixation and helping it cope with biotic and abiotic stress.
Aims: This study aimed to isolate and characterize *Methylobacterium* species associated with *Helianthus tuberosus* and maintain them in various experimental systems, ultimately identifying their potential applications in sustainable agriculture.
Materials and Methods: A pink bacterium, which evaded sterilization of *H. tuberosus* stem fragments during the initiation of *in vitro* culture, was observed growing in the vicinity of the tissues. DNA was extracted from both plant tissue-associated bacteria and pure culture, and analyzed by PCR using primers specific to the *Methylobacterium* genus (Nishio *et al.*, 1997).
Results: The pink coloration of the bacterial colonies served as an initial indication that the microorganism in question belongs to the *Methylobacterium* genus. This was confirmed by subsequent PCR analysis using primers specific for the *Methylobacterium* genus. Remarkably, these bacteria were also able to grow on a plant-specific culture medium (MS salts) with methanol (1%) replacing sucrose as the primary carbon source. Further tests are needed to precisely identify the species.
Conclusion: The availability of this type of beneficial bacteria represents a significant asset for sustainable agriculture practices. This "good bacteria" has the potential to contribute to the development of environmentally friendly strategies for enhancing plant health and productivity.

Keywords: *Helianthus*, *in vitro* cultivation, *Methylobacterium*, PCR, sustainable agriculture

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DEVELOPMENT OF ORGANIC HETEROGENEOUS MATERIALS IN SALAD TOMATOES: PRELIMINARY PHASES OF EVALUATION BASED ON YIELD AND QUALITY OF STARTING POPULATIONS

Adrián BERENGUER-GARCÍA, David HERNÁNDEZ-MESEGUER, Marisa JIMÉNEZ-PÉREZ, Ana M. ADALID-MARTÍNEZ, Ana FITA and Adrián RODRÍGUEZ-BURRUEZO*

COMAV Institute, Universitat Politècnica de València (UPV), Valencia, Spain
*Corresponding author, e-mail: adrodbur@upvnet.upv.es

Introduction: Climate change is forcing tomato producers, technicians and breeders to face agroclimatic risks in Mediterranean areas, and a more diverse and resilient farming sector is needed to face the changing conditions. In this regard, organic heterogeneous materials (OHM) are populations bred for organic farming, quite homogeneous for appearance traits, but keeping certain underlying genetic heterogeneity, including genes that might offer adaptative responses to a changing climate. OHMs are usually obtained by crossing several varieties, followed by mass selection.
Aims: This work studied a segregating *S. lycopersicon* composite cross population, as the first stage of a future OHM, under organic farming, recording its diversity in main agronomic traits and identifying the best individuals to carry on the breeding procedure.
Materials and Methods: We evaluated 250 plants, obtained by combining 2 landraces of Valenciano oxheart tomatoes and 2 "de Penjar" (hanging) tomatoes, following a double hybrid scheme, which were grown in open field condition, at an organic farm (Valencia, Mediterranean Spain) in the summer of 2023. Yield (g/plant), soluble solids (SS, %), total acidity (TA, %) were measured in all plants.
Results: A huge segregation appeared in the studied traits. Yield ranged from 340 to 4800 g/plant, and several plants reached >4000 g (equivalent to 80 t/ha). SS and TA were also highly variable, comprised between 2.30 and 7.30% in SS and between 0.47 and 1.73% in TA. This variation arose several individuals with high yield (>3000 g/plant), SSC (>5%) and TA (>1%).
Conclusion: The variation observed in the first stage of the developing OHM was much higher than expected, even transgressive to the parents, and provided many individuals (15% population) to keep efficiently the mass procedure to a future tomato OHM adapted to the Spanish Mediterranean area.

Keywords: agroclimatic resilience, heterogeneous materials, mass selection, organic farming, *Solanum lycopersicon*

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COMPARATIVE STUDY OF SPANISH TOMATO HEIRLOOMS UNDER ORGANIC FARMING IN THE MEDITERRANEAN COAST OF SPAIN

Adrián BERENGUER-GARCÍA, Marisa JIMÉNEZ-PÉREZ, David HERNÁNDEZ-MESEGUER, María PALLARDO-MARAVILLA, Ana ADALID-MARTÍNEZ, Ana FITA and Adrián RODRÍGUEZ-BURRUEZO*

COMAV Institute, Universitat Politècnica de València (UPV), Valencia, Spain
*Corresponding author, e-mail: adrodbur@upvnet.upv.es

Introduction: Tomato (*Solanum lycopersicon*) is the most important vegetable of Spain, which is the main producer of Europe. Also, a plethora of heirlooms can be found in Spain as centre of diversity. Such materials, bred in ancient times before the green revolution, may offer adaptation to low-input systems in Mediterranean areas. Also, their diversity may hide useful variation for quality factors, helpful for their valorisation.
Aims: This work evaluated a collection of Spanish and Italian tomato landraces under organic farming, identifying accessions adapted to one or both locations, according to specific traits of agronomic importance.
Materials and Methods: Sixteen tomato heirlooms, most from Spain (12) and others from Italy (4), were grown in open field in two organic farms around Valencia (Spain): Meliana (North) and Picassent (South), in the summer of 2023. Yield (g/plant), total sugars (TS, g/kg fw, HPLC) and ascorbic acid (AA, mg/kg fw, HPLC) were estimated.
Results: A considerable diversity was found in both locations. Yield ranged among heirlooms from 380 to 2862 g/plant in Meliana and 170 to 3127 g/plant in Picassent. TS were comprised between 26-54 g/kg in Meliana and 34-59 g/kg in Picassent, while AA ranged between 7-322 mg/kg in Meliana and 52-289 mg/kg in Picassent. There was no location effect in yield as averages were similar (1.26 vs. 1.39 kg/pl) and most heirlooms showed similar yields in both trials, and the same was found in TS (37 vs. 39 g/kg). However, AA was considerably higher in Picassent (148 vs. 98 mg/kg on average) and most accessions showed higher values here. Probably, soil properties in Picassent (sandier than Meliana) might cause hydric stress in the plants, compensating accumulating AA as an antioxidant response.
Conclusion: Tomato heirlooms showed a considerable variation for the investigated agronomic traits, offering the opportunity of selecting varieties adapted to organic farming in different locations and high fruit quality parameters.

Keywords: breeding, diversity, organic farming, *Solanum lycopersicon*

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HISTORICAL AND LANDSCAPE STUDY - STRĂOANE, VRANCEA COUNTY

Păunița BOANCĂ[1]*, Dan Florin FLORUȚ[2], Sonia BODEA[1], Alice OPRICĂ[3], Adelina DUMITRAȘ[1] and Andrei MĂRINCEAN[1]

[1]Faculty of Horticulture and Business in Rural Development, Departemt of Horticulture and Landscape Architecure, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania
[2]Aedilis Proiect, Baia Mare, Romania
[3]Faculty of Architecture and Urbanism, Technical University of Cluj-Napoca, Romania
*Corresponding author, e-mail: paunita.boanca@usamvcluj.ro

Introduction: The historical and landscape study was conducted with the overarching objective of providing a foundational basis for the development concept of Străoane commune, Vrancea County.
Aims: The study aims to identify valuable and distinctive elements of the built environment and landscape within Străoane commune, with the goal of establishing local identity and ensuring cultural-historical continuity. The landscape study brings to the forefront elements of landscape analysis with the aim of drawing clear regulatory guidelines for the landscape of the studied area.
Materials and Methods: The study employs a multicriterial analysis approach, providing a comprehensive set of useful information for both strategic and operational planning. It includes a historical-cultural diagnosis of the current situation, followed by recommendations for a future local vision and specific prescriptions. The landscape study was correlated with the historical study and examines the landscape and its character, determines the landscape's sensitivity to change, and makes recommendations regarding the sustainable development of the managed or natural landscape.
Results: The results contain detailed information regarding: the studied territory as a product of historical evolutions, highlighting general development trends and defining elements that have characterized different historical periods; the areas with coherent and valuable morphology, placing these areas within their historical, political, economic, and artistic contexts; the listed monuments and built heritage values within the territory, and to assess their conservation and protection status; the protected historical areas, indicating the type and degree of protection required based on their categorization; the valuable historical buildings within the studied territory; the areas or buildings with significant environmental value that require protection.
Conclusion: The data provide a detailed picture of the defining characteristics of the area and how the most prominent of these features can be reflected in the future development. The area is characterized by a landscape specific to the rural Vrancea region and by distinct historical features.

Keywords: heritage, historical, landscape, rural area

LANDSCAPE AND VISUAL IMPACT ASSESSMENT. CASE STUDY: SĂSAR NEIGHBORHOOD, BAIA MARE

Păunița BOANCĂ[1]*, Dan Florin FLORUȚ[2], Sonia BODEA[1], Alice OPRICĂ[3], Adelina DUMITRAȘ[1] and Andrei MĂRINCEAN[1]

[1]Faculty of Horticulture and Business in Rural Development, Departemt of Horticulture and Landscape Architecure, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania
[2]Aedilis Proiect, Baia Mare, Romania
[3]Faculty of Architecture and Urbanism, Technical University of Cluj-Napoca, Romania
*Corresponding author, e-mail: paunita.boanca@usamvcluj.ro

Introduction: The landscape study examines the landscape and its character, determines the landscape's sensitivity to change, and makes recommendations for the sustainable development of the managed or natural landscape. This is done to guide urban development and underpin the urban planning regulations related to the Zonal Urban Plan - Săsar Neighborhood - I.L Caragiale - Victor Babeș - Independenței Boulevard.
Aims: The objectives of this study are: assessing landscape sensitivity, supported by evaluating landscape character and making recommendations regarding the sustainable development of the managed landscape to guide urban development and underpin the urban planning regulations developed within the Zonal Urban Plan - Săsar Neighborhood - I.L Caragiale - Victor Babeș - Independenței Boulevard. The purpose is to provide a necessary assessment for establishing the appropriate scale, form, and location of future developments to minimize damage to the landscape and settlements.
Materials and Methods: There were three phases as follows: Initiation; Landscape analysis and characterization; Evaluation of landscape values and landscape sensitivity to change:
Phase 1 – Initiation: Description of the location and context of the studied area; Collection of basic data and information; Basic mapping and combination of mapped data. Phase 2 – Landscape Analysis and Characterization: Delimitation of the studied objective; Description of the general character; Evaluation of specific vegetation; Evaluation of topographic characteristics; Identification of key viewpoints and their significance. Phase 3 – Evaluation of Landscape Values and Landscape Sensitivity: Assessment of how the visual character of the landscape is perceived, experienced, and valued.
Results: The results of the study facilitated the following: highlighting dysfunctions and intervention priorities; proposals for eliminating/reducing dysfunctions; forecasts, scenarios, or development alternatives.
Conclusion: The landscape study brings to the forefront elements of landscape analysis with the aim of drawing clear regulatory guidelines for the landscape of the studied area.

Keywords: development, landscape, urban, visual impact

BIOLOGICAL PROPERTIES AND FRUIT QUALITY TRAITS OF THREE SWEET CHERRY VARIETIES GROWN IN THE EXPERIMENTAL ORCHARD OF UASVM CLUJ-NAPOCA

Orsolya BORSAI[1], Lehel LUKÁCS[2], Sandor RÓZSA[1], Olimpia-Alina IORDĂNESCU[3], Ionuț Dascălu[3], Viorel MITRE[4], Cătălina DAN[1] and Flavia-Andreea ANDRECAN[1]*

[1] Faculty of Horticulture and Business in Rural Development, UASVM Cluj-Napoca, Romania
[2] Horticultural Research Station Cluj-Napoca, UASVM Cluj-Napoca, Romania
[3] Faculty of Engineering and Applied Technologies, University of Life Sciences "King Mihai I" from Timișoara, Romania
[4] The Academy of Agricultural and Forestry Sciences "Gheorghe Ionescu-Șișești", Bucharest, Romania
*Corresponding author, e-mail: andreaflavia_tripon@yahoo.com

Introduction: Cherries are special tree fruits, which are ripening first among temperate fruits and are highly appreciated due to their attractive appearance and nutritious values (high polyphenol content and antioxidant activity) and the flavour of the fruits. However, cherries still remain a challenging and high-risk fruit crop to grow (Gonçalves *et al*., 2021).
Aims: The main aim of the research was to monitor and compare tree growth and fruit quality in three sweet cherry varieties grown under the climatic conditions of Cluj-Napoca.
Materials and Methods: Three cherry varieties ('Van', 'Venus' and 'Varikse Zwarte') were studied. The measurements concerned tree height, canopy volume, trunk diameter, average length of the annual growth, trunk cross-sectional area, yield and yield efficiency. To define fruit quality, fruit weight, fruit dimensions, shape index, firmness of the pulp, water content, total soluble solid content and pH of the fruits were determined.
Results: In terms of growth and vigour, 'Venus' variety stood out to be the most vigorous among the three varieties investigated. Concerning the physical properties of the fruits, the results showed that 'Venus' variety had the highest values regarding size, weight and firmness of the fruits. However, from the biochemical point of view, 'Varikse Zwarte' variety proved to be more valuable (19,8 °Brix and 4.09 pH).
Conclusion: In the present research work, it was revealed that tree height, canopy volume, trunk diameter, annual shoot length and the cross-sectional area of the trunk are positively correlated to yield efficiency and the size of the fruits. Another positive correlation has been observed between the physical fruit properties analyzed. However, the chemical properties and some of the physical traits of the fruits were negatively correlated to tree growth parameters.

Keywords: fruit quality, sweet cherry, TCSA, TSS, yield efficiency

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THE INFLUENCE OF *MYCORRHIZAE* ON GRAPE QUALITY AND BIOLOGICAL INDICES OF VEGETATIVE BALANCE IN BURGUND MARE VARIETY, IN THE CLIMATE CONDITIONS OF SATU-MARE

Anamaria CĂLUGĂR, Zsolt-Tibor GAL, Florin-Dumitru BORA, Anca Cristina BABEȘ and Cladiu Ioan BUNEA*

Faculty of Horticulture and Business in Rural Development,
University of Agricultural Science and Veterinary Medicine of Cluj Napoca, Romania
*Corresponding author, e-mail: claudiu.bunea@usamvcluj.ro

Introduction: In grapevine culture, mycorrhizae represent a symbiotic relationship between plant roots and certain fungi that live in the soil, acting as an extension of the root system. The use of mycorrhizae in viticulture can bring many benefits, including improved development, fruiting, fruit and vine ripening, increased resistance to diseases and pests such as powdery mildew and downy mildew, adaptability to difficult climatic conditions, and improved yield quality and quantity (Trouvelot *et al.*, 2015).
Aims: The aim of our study was to evaluate the influence of a product –Symbivit, containing different mycorrhizaem, used at planting on Burgund Mare grape variety, on yield quality.
Materials and Methods: Through the study conducted in this work, an attempt was made to observe the behaviour of the Burgund Mare variety over the years 2023-2024. The experiment was placed within a personal plantation located in the municipality of Satu-Mare. Training system used were: Control Variant CV - Guyot on a semi-trunk (non-mycorrhizal), V1 - unilateral cordon, and V2 - Guyot on a semi-trunk. The determinations made involved observing the influence of mycorrhizae on growth, development, fruiting, fruit ripening, and not least, the ripening of annual wood, calculating fertility and productivity elements, analysing sugar concentration, total acidity level and production quantity.
Results: From the point of view of fertility and productivity, the Burgund Mare variety had high values of fertility coefficients and productivity indices across all training forms. The quality of the harvest is given by the accumulation of sugar in the berries. The variant that favoured better sugar accumulation was the unilateral cordon training form, with 201.6 g/l at the time of harvest. The highest yield per vine was 4.66 kg/vine for the Guyot on semi-trunk training variant, followed by the unilateral cordon variant - 4.62 kg/vine, and the Control variant with the non-mycorrhizal Guyot on semi-trunk training form (CV) - 2.74 kg/vine under the conditions of the year 2023.
Conclusion: In the present research work, we demonstrated that the use of mychorrhizea in grapevine cultivation has an important influence of grape quality and also on grapevine development.

Keywords: Burgund mare, grapes, mychorrhizae, quality

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EFFECTS OF *IN VITRO* CULTURE PERIOD AND PLANT GROWTH REGULATORS ON BIOMASS PRODUCTION IN SEVEN *HYPERICUM* SPECIES

Doina CLAPA[1], Monica HÂRŢA[1]*, Ana Maria RADOMIR[2], Adrian George PETICILĂ[3], Mirela Irina CORDEA[1], Adelina DUMITRAŞ[1] and Dorin Ioan SUMEDREA[2]

[1] Faculty of Horticulture and Business in Rural Development, University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca, 400372, Cluj-Napoca, Romania
[2] National Research and Development Institute for Biotechnology in Horticulture Ştefăneşti-Argeş, 117715, Ştefăneşti, Argeş, Romania
[3] Faculty of Horticulture, University of Agronomic Sciences and Veterinary Medicine of Bucharest, 011464, Bucharest, Romania
*Corresponding author, e-mail: monica.harta@usamvcluj.ro

Introduction: Biomass production for *Hypericum* spp. is traditionally based on the collection of plants from wild resources, presenting risks such as loss of genetic diversity and habitat destruction. Conversely, *in vitro* cultures offer sustainable alternatives for biomass production.
Aims: This study aims to optimize the *in vitro* culture conditions for seven *Hypericum* species, focusing on the duration of the *in vitro* culture period in the presence or absence of cytokinins.
Materials and Methods: Seven *Hypericum* species were used: *H. androsaemum*, *H. calycinum*, *H. hirsutum*, *H. kalmianum*, *H. olimpicum*, *H. perforatum* and *H. triquetrifolium*. For biomass production, the explants (1-1.5 cm) were placed in 370 mL jars (three per jar) with 50 mL of basal MS medium, with or without cytokinins. Four concentrations of meta-Topolin (mT) and BA, respectivelly 0.1/0.2 mg/L BA and 1.0/2.0 mg/L mT were tested. Biomass production was measured after 40 and 60 days.
Results: Biomass production generally increased in 60-day *in vitro* cultures for most species studied. The highest biomass accumulation occurred within all seven *Hypericum* species investigated when cultivated on MS medium supplemented with 0.1 and 0.2 mg/L BA, after 60 days. *H. triquetrifolium* showed the highest biomass quantity (7.93 ± 0.34 g) on MS + 0.2 mg/L BA after 60 days, followed by *H. perforatum* (5.47 ± 0.96 g) under the same conditions. It is worth noting that both species also had the lowest biomass on the culture medium without PGRs, both after 40 and 60 days.
Conclusion: Our study showed that shoot biomass growth in the studied *Hypericum* species was influenced by both the *in vitro* culture period and the type and concentration of cytokinins.

Keywords: 6-benzyl adenine, *H. perforatum*, meta-Topolin, micropropagation

STUDIES ON WINES OBTAINED IN DIFFERENT CLIMATIC YEARS FROM FETEASCA NEAGRA GRAPE VARIETY IN COTESTI VINEYARD

Lucia Cintia COLIBABA*, Daniel-Alexandru HRISCU, Camelia Elena LUCHIAN, Daniela SIMINEL, Tiberiu ANDRIEȘ, Liliana Rotaru and Valeriu V. COTEA

Iasi University of Life Sciences, Faculty of Horticulture, Department of Horticultural Technologies, Iasi, Romania
*Corresponding author, e-mail: cintia.colibaba@iuls.ro

Introduction: Different climatic conditions influence the physico-chemical composition of grapes, leading to inconsistent wine quality and consumer confusion. Wines obtained from Feteasca neagra grape variety in 2022-2023 harvest, from Cotesti vineyard, from Pandora vinery have been taken into analysis (Fei *et al*., 2022).
Aims: The study focused opn the analysis of chemical and sensorial structure of red and rose wines obtained from Feteasca neagra grape variety in 2022-2023 harvest years.
Materials and Methods: Six wine samples have been taken into study: Stories Feteasca neagra, Secrets Feteasca neagra and Mon Rose Feteasca neagra from 2022 and 2023. Physico-chemical parameters have been analysed according to OIV and national regulations, while sensorial profile was determined using tasting sheets and a trained panel.
Results: Climatic analysis of 2022 and 2023 harvest years has been performed and discussed alongside the main dimensions of the wine samples taken into study. Correlations between yearly mean temperatures and alcoholic concentration of the wines or titrable acidity have been drawn. Sensorial profiles show the importance of climatic conditions in defining wine's organoleptic attributes.
Conclusion: Climatic conditions are of the utmost importance when quality wine is involved.

Keywords: climatic conditions, Feteasca neagra, wine sensorial profile

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WINEMAKING METHODS AND TASTING CONTEXT IN CORRELATION WITH SENSORIAL SENSES AND PHYSICOCHEMICAL PARAMETERS

George Ștefan COMAN, Camelia Elena LUCHIAN*, Elena Cristina SCUTARAȘU, Lucia Cintia COLIBABA and Valeriu COTEA

Faculty of Horticulture, „Ion Ionescu de la Brad" University of Life Sciences, Iași, Romania
*Corresponding author, e-mail: camelia.luchian@iuls.ro

Introduction: Hedonism in human food perception involves three primary senses: sight, smell (including orthonasal and retronasal aspects), and taste (involving taste buds and somatosensory sensations via the trigeminal nerve). The sensory quality of wine, influenced by grape variety, vineyard location, and viticultural and vinification practices, is crucial for its sensorial description. Questions have emerged under O.I.V. regulations about how differing tasting conditions might affect perceived sensory attributes.
Aims: The aim of this research was to examine how winemaking methods impact olfactory and gustatory sensory perceptions, and to investigate the effects of excluding one sensory channel -specifically visual analysis - on perception of a wine's organoleptic characteristics. Excluding visual analysis is relevant because the ability to accurately identify substances by smell decreases by approximately 30-50% when the visual context of the sample is absent. This decline in olfactory accuracy occurs for both familiar and unfamiliar odors.
Materials and Methods: Commercial wine samples were evaluated through "double-blind" tastings, both with and without visual cues. Participants, legally permitted to drink and experienced in sensory evaluation, took part. A Fourier-transform infrared spectroscopy analyzer (Lyza 5000 Wine - Anton Paar) was used to measure physicochemical parameters, correlating them with sensory data.
Results: Analyzing the results obtained from sensory analysis alongside usual physicochemical parameters determined by O.I.V-approved methods revealed a correlation between reduced phenolic compound content and sensory perceptions of astringency. Additionally, the influence of visual context suppression was observed, particularly in identifying the specific maceration stage characteristic of "red wine" vinification.
Conclusion: Suppressing visual parameters in a "double-blind" tasting significantly reduces inherent confirmation bias.

Keywords: bias, sensorial senses, tasting context, winemaking

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ASSESSMENT OF TOMATOES GENOTYPES IN GREENHOUSE CONDITIONS

Mirela Irina CORDEA[1], Ioana MOLDOVAN[2], Monica HARTA[1], Doina CLAPA[1], Ulian BESLEAGA[2] and Lehel LUKACS[2*]

[1] Faculty of Horticulture and Business in Rural Development, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania
[2] Horticulture Research Station, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania
[*]Corresponding author, e-mail: lehel.lukacs@usamvcluj.ro

Introduction: The tomato (*Lycopersicon esculentum* L.) is a widely cultivated greenhouse vegetable with diverse applications worldwide. As one of the most important fruit crops globally, tomatoes are a rich source of nutrients, particularly vitamin C, and essential minerals like phosphorus, iron, and calcium. Due to the rising demand for high-quality produce throughout the year, tomato cultivation in controlled environments has become increasingly popular, allowing growers to maximize productivity and quality regardless of seasonal changes. In regions with challenging environmental conditions, greenhouses provide a flexible and sustainable method for tomato production.
Aims: This study aimed to assess various tomato genotypes under greenhouse conditions to identify those with superior agronomic traits and adaptability to controlled environments.
Materials and Methods: The experiment was carried out in the greenhouse of Horticultural Research Station UASVM Cluj-Napoca. The biological material was represented by five tomato genotypes organized in three replicates. The measurements and observations of traits taken in considerations were: no. of flowers/inflorescence, no. of fruits/inflorescence, fruit shape index and fruit weight. The data were analyzed by IBM SPSS Statistics 19.0., ORIGINPRO 2021 v.9.8 and PAST 4.1.1. software.
Results: The results showed a high variability between the five genotypes analyzed. Following the observations on the five genotypes under study, in the case of rate of flower binding, it was found that the fruit set rate for all the analyzed genotypes was 56%, which is due to the very high temperatures in the greenhouse. Analyzing the fruit's weight, we can observe a very high variability of this character, extending from 89.10 g in the Darsirius cultivar, to 406.17 g in the Gourmansun. The fruit shape index of the analyzed cultivars was also wide-ranging, with values from 0.8 for the Siriana genotype, up to 1.7 for the Darsirius genotype. Based on the analyzed morphological parameters, the dendrograms grouped the genotypes into two groups: the first cluster includes the genotypes named Gurmansun and Dimerosa, and the second cluster is made up of the genotypes Siriana, Darsisius, and Vitamina.
Conclusion: Based on these results, we can say that the set of the flowers, with temperatures over 35° C, led to the abortion of flowers, obtained a lower number of fruits set. The main analyzed parameter that differentiates between the analyzed tomato genotypes is fruit weight (g). The fruit shape index confirmed its shape through visual observations.

Keywords: cultivars, fruit shape index, *Lycopersicon,* variability, variety

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PHENOTYPIC PROFILES FOR CHERRY VARIETIES ESTABLISHED AT UASVM CLUJ-NAPOCA

Catalina DAN[1], Adriana SESTRAS[2], Flavia-Andreea ANDRECAN[1*], Orsolya BORSAI[1], Alina TRUTA[2], Irina MORAR[2], Mădălina MILITARU[3] and Radu E. SESTRAS[1]

[1] *Faculty of Horticulture and Business in Rural Development, USAMV Cluj-Napoca, Romania*
[2] *Faculty of Silviculture and Cadastre, USAMV Cluj-Napoca, Romania*
[3] *Research Institute for Fruit Growing ICDP Pitesti-Maracineni, Romania*
[*]Corresponding author, e-mail: andreaflavia_tripon@yahoo.com

Introduction: Cherry (*Prunus avium* L.) is a species appreciated by consumers for the taste of the fruit and spread among producers due to the profitability of the orchards. In Transylvania, there are several varieties that are well known and appreciated for the adaptability to the eco-climatic conditions, but a general overview and a comprehensive description of them is still lacking.
Aims: The aim of the study is to establish phenotypic profiles for the important varieties found at UASVM Cluj-Napoca, which are to be completed with genetic mapping and biochemical descriptors. Correlating with ecological data, and part of a research project, the study aims in the end at elaborating a general data base for the fruit tree genotypes.
Material and methods: The characteristics of the leaf, flowers and fruit were investigated, following UPOV guidelines and data from the scientific literature. The first data were put together regarding the flowering (with the specific offset for the early-late varieties in the collection), followed by fruiting. As the research progresses, the phenotypic determinations will be supplemented with the genetic and biochemical results.
Results: Flowering was obviously staggered between the studied cultivars, but all were affected by the atypical spring of 2024, with very high temperatures and little precipitation. Thus, it can be concluded that flowering was abundant in all cultivars, with longer lasting flowers (petal shedding was delayed by 3-5 days compared to typical cultivars). Fruits were harvested at full maturity (for consumption), at different times- specific to the varieties in the collection (May-June 2024 period), and determinations shown significant differences for fruit set, health status, weight, diameter of fruit.
Conclusions: It is of great value to offer complete and specific information to producers about the varieties of interest in different areas. Thus, the need of a comprehensive data base for fruit tree is taken into consideration and investigations are in progress.

Keywords: cherry, orchard, pomology, *Prunus*

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ALMOND CULTIVARS RELEASED AT RESEARCH STATION FOR FRUIT GROWING CONSTANȚA

Corina GAVĂT* and Mihaela NISTOR

Research Station for Fruit Growing Constanța, 25 Pepinierei Street, Valu lui Traian, Constanța, România
*Corresponding author, e-mail: corina_gavat@yahoo.com

Introduction: *Amygdalus communis* L. finds good growing and fruiting conditions in the southeastern part of Romania and in certain areas of the Banat (south-west). Farmers consider almonds as a profitable crop, the kernel being resistant to storage and the core having a high selling price on the domestic and foreign markets. At Research Station for Fruit Growing Constanța (RSFG Constanța), the study of this species started in the 70-80's, with very good results, then the germplasm collection was replaced to RSFG Oradea. In 2007, due to the collaboration between the two research stations, the almond collection was grafted and currently there are over 110 genotypes at RSFG Constanța, with 5 trees/specimens. The experimental/ demonstration lots, settled in during 2011-2014, contain several cultivars of this species. The recorded yields were good, and the selections 'Autofertil 1' and 'Autofertil 2' were taken in testing in 2003 and registered at ISTIS with the names 'Veronica' and 'Mirela' respectively, in 2018.
Aims: Self-fertile cultivars with late bloom and early fruit ripening are valuable because the differentiation of fruit buds is done until late autumn. Frosts during the flowering period are a main risk factor for almond. The aim of this work was to highlight that the 'Veronica' and 'Mirela' cvs. are corresponding to the current climatic conditions and they can assure market requirements.
Material and methods: 'Veronica' and 'Mirela' were studied according to UPOV descriptors (TG 65/3) regarding the main phenophases, the fertility coefficient during natural pollination, yield per tree, average weight of fruit, the percentage of core/shell, etc. The control cv. was 'Ferragnes', widely used in France and Spain. The determinations of lipids were also done, by the gravimetric method, allowing the determination of total extractable fatty substances.
Results: Planting almonds on irrigated land in Dobrogea is a reasonable alternative culture, due to the following aspects: the temperatures of the last fifteen days of March are normally suitable for the processes of pollination, pollen tube growth, fertilization and fruit set up to occur; while spring and summer temperatures are suitable for tree growth and fruit ripening. Flowering on the same tree, within the same cultivars, is very staggered, so that a large number of trees escape the negative impact of the low temperatures that sometimes occur in spring. It is important to note that there are late flowering cultivars that reduce the risk of frost. For the rest of the physiological processes that comprise the annual crop cycle, temperature is not considered a limiting factor.
Conclusion: 'Veronica' and 'Mirela' enrich and diversify the assortment; they have late flowering, early fruit ripening from the 3rd decade of August - the 1st decade of September and, from the 1st and 2nd decade of September respectively and good yields.

Keywords: flowering, kernel, phenology, total lipids (%), yields

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THE EFFECT OF BLANCHING, COATING AND DRYING METHOD ON THE QUALITY OF DEHYDRATED APPLE SLICES

Tincuța-Marta GOCAN[1], Orsolya BORSAI[1], Daniela-Sabina POȘTA[2], Iuliana MOTRESCU[3], Lehel LUKÁCS[4] and Sándor RÓZSA[1]*

[1] Faculty of Horticulture and Business in Rural Development, UASVM Cluj-Napoca, Romania
[2] Faculty of Applied Sciences and Engineering, Banat University of Agricultural Sciences and Veterinary Medicine „King Michael I of Romania" from Timişoara, Romania
[3] Faculty of Horticulture, University of Life Sciences "Ion Ionescu de la Brad", Iasi, Romania
[4] Horticultural Research Station Cluj-Napoca, UASVM Cluj-Napoca, Romania
*Corresponding author, e-mail: rozsa.sandor@usamvcluj.ro

Introduction: Apples still are and will remain one of the ideal fruits for snacks due to their high nutritional value and important role in human health for the treatment of cardiovascular diseases, fever, infections, phlegm and even cholera (Heidari, 2022; Zhang *et al*., 2023).
Aims: The main purpose of this work was to test some coating and dehydration methods in order to produce high quality apple chips from Florina and Golden Delicious apple varieties.
Materials and Methods: In order to obtain the dehydrated apple slices, two dehydration methods (oven and fruit dehydrator), blanching and coating methods were applied.
Results: The results of this research show that Florina variety is more suitable and efficient for dehydration. Dehydrating apple slices in the oven was more efficient and the final products were more appreciated by the evaluators, compared to those dehydrated in the fruit dehydrator. In the case of both methods, apple slices pre-treated with ascorbic acid were more appreciated by the evaluators, primarily because of their colour. However, essential oils contributed significantly to the preservation of the colour, texture and appearance of the apple slices, while the taste conferred to the final product was not appreciated by everyone.
Conclusion: The evaluators preferred apple slices with lower water content, due to their crunchiness. After the texture, colour and taste were the decisive characters in the evaluation of the apple slices.

Keywords: apple chips, blanching, dehydration, pre-treatment

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THE INFLUENCE OF HYBRID AND PLANTING DENSITY ON KOHLRABI YIELD

Tincuța-Marta GOCAN[1], Rodica Maria SIMA[1], Mariana-Florica BEI[2], Sándor RÓZSA[1], Gheorghe POȘTA[3] and Alexandru-Ioan APAHIDEAN[1]*

[1] Faculty of Horticulture and Business in Rural Development, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania
[2] Faculty of Horticulture, University of Oradea, Romania
[3] Faculty of Engineering and Applied Technologies, University of Life Sciences "King Mihai I" from Timișoara, Romania
*Corresponding author, e-mail: alexandru.apahidean@usamvcluj.ro

Introduction: Kohlrabi is grown for its tuberous stem, which has a white-greenish, light green or purple colour. Tuberous stems are used in various forms, both fresh and in the culinary foods, boiled and baked, in soups and other preparations. Due to its specific taste, high vitamin C and potassium content, kohlrabi became an important vegetable in the human diet (Marcinkowska e*t al*., 2021).
Aims: The main aim of this research was to determine the influence of hybrids and planting density on production of *Brassica oleracea* var. *gongylodes.*
Materials and Methods: In order to carry out the research, three kohlrabi hybrids (Volturno F1 RZ, Cindy F1 RZ and Kolibri F1) were sown at three different planting densities (Mahdi, 2020). Plant growth and productivity were determined based on various growth parameters such as plant height, leaf number, stem and leaf rosette diameter and yield/ha (Uoon and Cho, 2019).
Results: The results showed that Cindy F1 hybrid grew the most in height, but developed lower number of leaves as compared to the other hybrids. Volturno F1 hybrid had the highest number of leaves developed, while Kolibri F1 had the highest yield. The highest yields were recorded at the planting density of 185.186 plants/ha in all hybrids. The most productive hybrid proved to be Kolibri F1 hybrid.
Conclusion: In the present research work, it has been demonstrated that the hybrid itself influenced the yield through its productive capacity, but a clear positive correlation was revealed between planting density and yield.

Keywords: German turnip, productivity, plant development, tuber weight

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CHRYSANTHEMUM MICROPROPAGATION – THE HIGHLIGHTS OF 30 YEARS OF RESEARCH IN SERBIA

Sladjana JEVREMOVIC*, Milana TRIFUNOVIC-MOMCILOV and Angelina SUBOTIC

Institute for Biological Research "Siniša Stanković" - National Institute of the Republic of Serbia, University of Belgrade, Belgrade, Serbia
*Corresponding author, e-mail: sladja@ibiss.bg.ac.rs

Introduction: At the Institute for Biological Research ”Siniša Stanković”, research on the development and optimization of micropropagation protocols for more than 30 *Chrysantemum* cultivars has been carried out continuously for 30 years (Radojević *et al.*, 1994). Shoots with a very short callus phase were induced on the initial explants, suggesting a high clonal fidelity of the regenerated seedlings even after long-term micropropagation (Jevremović *et al*., 2012). Synthetic seed technology and cold air plasma technology in combination with micropropagation (Škoro *et al*., 2022) are useful systems for improving *Chrysanthemum* production. Temporary immersing bioreactor systems could be an efficient method for mass propagation of chrysanthemums.
Aims: The main objective of this paper was to highlight some of the key findings, including recent results in the application of bioreactors that can be used for efficient commercial *Chrysanthemum* production.
Materials and Methods: Shoots were induced using stem and leaf segment cultures. To produce synthetic seeds, shoot tips were encapsulated in sodium alginate before treatment, with cold plasma.
Results: *In vitro* cultures can successfully survive cold storage at 4 °C for up to six months without subculture. Clonal fidelity was confirmed for some cultivars even after ten years of micropropagation. Bioreactor culture can be an efficient method for mass shoot multiplication. Cold air plasma treatment is an effective strategy to reduce contamination of *in vitro*-derived synthetic *Chrysanthemum* seeds before sowing in the field.
Conclusion: In this paper, we demonstrated the most important results that can be used for planning *Chrysanthemum* production.

Keywords: bioreactors, clonal fidelity, synthetic seeds, tissue culture

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EVALUATION OF *CAPSICUM* PEPPER LANDRACES UNDER SUSTAINABLE FARMING AND DEFICITARY IRRIGATION: YIELD, FRUIT WEIGHT AND CAROTENOIDS

Marisa JIMÉNEZ-PÉREZ, Roberto JUAN-MÉNDEZ, Adrián BERENGUER-GARCÍA, Mireia ROMANS-ESCRIVÁ, Estela MORENO-PERIS, Ana FITA, María D. RAIGÓN and Adrián RODRÍGUEZ-BURRUEZO*

COMAV Institute, Universitat Politècnica de València (UPV), Valencia, Spain
*Corresponding author, e-mail: adrodbur@upvnet.upv.es

Introduction: *Capsicum annuum* peppers are among the most important vegetables in the world. Spain is the main producer in Europe and a relevant centre of diversity. Also, producers of the Mediterranean area of Spain are facing challenges like the adaptation to organic farming and limited water availability.
Aims: The investigation aimed at evaluating the response of a collection of *C. annuum* to organic farming and water deficit, identifying genotypes adapted to both conditions, according to traits of agronomic importance.
Materials and Methods: The study considered 15 *C. annuum* landraces, most Spanish, grown under open field and organic cultivation, in two locations of Valencia (Spain): i) Meliana (usual irrigation, i.e. control) and Picassent (irrigation at 60%, i.e. drought treatment), in Spring-Summer 2023, planted at 1 x 0.4 m. Yield (g/plant) and red carotenoids (µg/kg of dry weight, spectrophotometric method of Minguez-Mosquera) were estimated.
Results: Wide diversity was found in both locations in the studied traits. Yield ranged from 837 to 2122 g/plant in Meliana and 460 to 1407 g/plant in Picassent. Red carotenoids were between 536-2267 µg/kg in Meliana and between 1003-2286 µg/kg in Picassent. A considerable effect of drought was detected: yield decreased on average (918 vs. 1390 g/plant) within most of the studied varieties (12). By contrast, carotenoids increased with water deficit, on average (1442 vs. 1168 µg/kg), for 11 accessions.
Conclusion: The variation observed allowed identifying accessions with a satisfactory combination of yield and carotenoids in organic farming, even under drought. Also, despite drought decreased pepper yield, it had positive effects on the accumulation of carotenoids, probably due to the antioxidant response to stress conditions.

Keywords: breeding, *Capsicum annuum*, diversity, drought, organic farming

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TOWARDS MORE RESILIENT PRODUCTION OF *CAPSICUM* PEPPERS: DEVELOPING ORGANIC HETEROGENEOUS MATERIALS BASED ON COMPOSITE CROSS POPULATIONS - INITIAL STAGES

Marisa JIMÉNEZ-PÉREZ, Roberto JUAN-MÉNDEZ, Adrián BERENGUER-GARCÍA, Estela MORENO-PERIS, Ana FITA and Adrián RODRÍGUEZ-BURRUEZO*

COMAV Institute, Universitat Politècnica de València (UPV), Valencia, Spain
*Corresponding author, e-mail: adrodbur@upvnet.upv.es

Introduction: Spain ranks 1st for peppers production in EU, even though facing climate change. Also, a more resilient agrifood system, to ensure food security is needed, considering a production based on i) organic farming and ii) a more diverse genetic background. In this regard, Organic Heterogeneous Materials (OHMs) are crop populations genetically diverse, obtained after combining several varieties (e.g. cross composite populations/CCP), followed by mass selection. OHMs are expected to be more adaptable to changing environments thanks to their genetic structure.
Aims: The study evaluated the performance of a first-stage *C. annuum* CCP, aimed at a future OHM, under organic farming and water deficit, recording diversity in main agronomic traits and identifying the best individuals to carry on the breeding process.
Materials and Methods: A CCP of 300 individuals (after combining 3 landraces of Valenciano/Bell and one Piquillo pepper), were grown in open field conditions, at an organic farm (Picassent, Mediterranean coast, Spain) in the summer of 2023, simulating drought (60% usual irrigation) as additional selection factor. Yield (g/plant) and soluble solids (SS, %) were estimated individually.
Results: As expected in double-hybrid CCP offspring, a considerable segregation was found for both traits studied. Yield variation was comprised between 200 and 2580 g/plant, and several plants reached >2000 g (i.e. 50 t/ha) even under drought conditions; SS were also highly variable, 6.45 to 11.30%. Such variation enabled the identification of many individuals with high yields (> 1500 g/plant) and SSC (>9.00%).
Conclusion: The variation observed in the CCP was even higher than expected and allowed the identification of a considerable number of individuals (20% CCP) to continue the process towards the first planned OHM population of bell peppers in the EU. Further studies will be performed in the next generations to assess how diversity evolves in our "under construction" OHM.

Keywords: breeding, food security, heterogeneous materials, organic farming, vegetables

Acknowledgements: Financed by EC through LIVESEEDING Project (grant 727230).

EFFECT OF SALINITY AND PLANT GROWTH PROMOTING MICROORGANISMS (PGPMS) ON THE PERFORMANCE OF CHIA (*SALVIA HISPANICA* L.)

Ioanna KAKABOUKI, Panteleimon STAVROPOULOS, Antonios MAVROEIDIS, Antigoni - Eleni FOLINA, Ioannis ROUSSIS and Dimitrios BILALIS*

Faculty of Crop Science, Agricultural University of Athens, Greece
*Corresponding author, e-mail: bilalis@aua.gr

Introduction: Chia (*Salvia hispanica* L.) is an annual crop, which is mainly cultivated for its seeds (Grancieri *et al*., 2019). It originates from Mexico and Guatemala and is now cultivated all around the globe (Ullah *et al*., 2016). Seeds are rich in proteins and bioactive peptides, while the seed oil has also high nutritional value (Martínez *et al.*, 2012).
Aims: The aim of this study was to assess the effect of PGPMs and salinity stress on the crop's performance.
Materials and Methods: A pot experiment was set up at the Agricultural University of Athens. Chia seeds (*Salvia hispanica* L. cv. Aztec) were sowed in sterile substate (Florabella, Klasmann-Deilmann). Fourteen days after the sowing, plants were watered with saline water (30 and 60 mM), while control was watered with distilled water. Treatments also included the application of PGPMs. PGPMs treatments consisted of a composition of AMF (*Glomus* spp.), rhizobacterium, and *Trichoderma atroviride* (2.2 and 4.5 g/pot).
Results: According to the results, chia was affected by salinity. Crop's growth was statistically significant lower under salinity stress, while yield was also redacted. The use of PGPMs increased all the studied agronomic parameters and the plants' tolerance to salinity.
Conclusion: Salinity affects chia's development and yield. The use of PGPMs can mitigate salinity stress and increase plant's tolerance.

Keywords: Chia (*Salvia hispanica* L.), plant growth promoting microorganisms (PGPM), salinity stress.

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EFFECT OF SUBSTRATE ON MICROGREENS PRODUCTION

Ioanna KAKABOUKI*, Panteleimon STAVROPOULOS, Antonios MAVROEIDIS, Spyridon KOUREMPES, Maria - Christina KOUREMPE, Ioannis ROUSSIS, Sotiria PATSIALI and Konstantinos PANTALEON

Faculty of Crop Science, Agricultural University of Athens, Greece
*Corresponding author, e-mail: i.kakabouki@aua.gr

Introduction: Microgreens are currently gaining attention due to their potential to improve nutritional value in human diet (Kyriacou et al., 2016). Substrates are regarded as a major aspect that might affect microgreen emergence and production (Du et al., 2022).
Aims: The aim of this study was to assess the effect of different substrates on the emergence and production of microgreens in 13 different plant species.
Materials and Methods: A chamber experiment was set up at the Agricultural University of Athens. A constant conditions chamber was used, in which the microgreens were installed. Plastic containers (13,5 cm diameter) filled with two different substrates (perlite and compost) were used. The plant species used for the production of microgreens were: chia, false flax, flax, maize, sorghum, tritordeum, buckwheat, quinoa, amaranth, lentil, chickpea, fenugreek and mustard. When the plants reached the harvest stage, they were removed from the chamber and cut using scissors. A precision balance was used to calculate the yield.
Results: Compost delayed significantly the emergence of the cotyledons. However, the yields were notably lower in perlite. In particular, in the majority of the assessed species, compost increased the microgreens yield by more than two-times fold.
Conclusion: Amongst the two substrates, compost was found more suitable to produce microgreens.

Keywords: Chia (*Salvia hispanica* L.), Plant Growth Promoting Microorganisms (PGPM), salinity stress

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THE EFFECT OF THINNING ON PEACH IN SOUTH-EAST ROMANIA

Gheorghe LĂMUREANU

Research Station for Fruit Growing Constanța, 25 Pepinierei Street, 907300, Valu lui Traian, Constanța, Romania
Corresponding author, e-mail: lamureanugheorghe@gmail.com

Introduction: Peach cultivars tend to set up a large number of fruits on the tree and there is a risk that they will remain small, with sour taste and without commercial value (Cepoiu and Manolache, 2006). That is why manual fruit thinning is considered effective, even if it is expensive (Costa and Vizzotto, 2000). Thinning is an essential agronomic intervention in peach cultivation, as final fruit quality largely relies upon the success of this technique (Costa and Botton, 2022).
Aims: By this research we observed how (that) manual thinning, within different intensities, influenced Filip and Redhaven peach cultivars' weight and productivity in studied years.
Material and methods: The study was carried out at Research Station for Fruit Growing (RSFG Constanța), in the period 2021-2023. The Filip and Redhaven peach cultivars were studied. The fruit trees are 12 years old and the crown shape is improved vase. The planting distance is 4 m /3 m. The experimental variants were: V1- 50% thinned fruits; V2- not thinned (Control). The fruits on control trees before and after thinning were numbered. The collected data was statistical calculated and interpreted by using the variance analyse method.
Results: The studied varieties have different biological potential regarding fruit yields; the intensity of flowering, as well as favorable or less favorable climatic conditions during fruit setting up contributing to this among others factors.
Conclusions: Out of the presented data we can clearly see that the thinning of fruits does not influence too much the production, but it has a big impact upon the fruit physical qualities such as weight.

Keywords: average weight, cultivars, yield

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EFFECTS OF HEAT STRESS ON THE MEDITERRANEAN ENDEMIC HALOPHYTE *LIMONIUM GIRARDIANUM*

Diana MIRCEA[1], Clara SANCHIS[1], M. Isabel MARTÍNEZ NIETO[1], Pilar SORIANO[2] and Monica BOSCAIU[2]*

[1] *Agroforestry Mediterranean Institute, Polytechnic University of Valencia, Spain*
[2] *Botanical Garden of the University of Valencia, Spain*
*Corresponding author, e-mail: mobosnea@eaf.upv.es

Introduction: *Limonium girardianum* is a halophyte endemic to the Mediterranean coastal salt marshes of southern France and eastern Spain, with highly fragmented distribution areas. This species is threatened by habitat transformation; it is protected in France, and its populations are declining in the Valencian salt marshes. In previous studies we showed that the species is tolerant to high salinity and moderate drought.
Aims: Considering the strong effects of global warming in the Mediterranean region, recent population declines may be directly caused by high temperatures. The aim of the work was to test the effects of heat stress, alone and combined with water stress, during different stages of its life cycle.
Materials and Methods: Seeds were placed in Petri dishes with filter paper and germinated for 21 days in a germination chamber, under the following conditions: a photoperiod of 16 h of light and 8 h of darkness and temperature regimes of 25-15 ºC, 30-20 ºC, 35-25 ºC and 40-30 ºC. Plants in early vegetative and flowering stages were subjected to a two-week heat stress at temperatures of 42/30 ºC and a photoperiod of 16 h light/8 h darkness, whereas in the control the chosen temperatures were 26/15 ºC. Irrigated and non-irrigated variants were used for the heat stress and control treatments.
Results: Optimum germination was recorded at the lowest temperatures tested (25-15 ºC), whereas the strongest inhibition at 35-25 ºC and 40-30 ºC. Plant growth was mainly affected by the combination of heat and water stress; after two weeks, the young plants were almost completely wilted, showing a significant reduction of their leaf water content. During the flowering phase, the effect of heat and water stress was not as pronounced and pollen formation in the anthers was apparently not affected.
Conclusion: The results indicate that high temperatures severely affect seed germination of this species, and the combination of heat and water stress affects the growth of young plants. Therefore, the prolongation of periods with increased temperatures in autumn and spring caused by global warming may affect the population recruitment.

Keywords: global warming, halophytes, heat stress

USE OF SYNTHETIC SEED TECHNOLOGY FOR THE REGROWTH OF ENCAPSULATED EXPLANTS IN *FRAGARIA × ANANASSA* USING PHYTOHORMONES AND ACTIVATED CHARCOAL

Ioana-Cătălina NICOLAE[1,2], Oana VENAT[1]*, Adrian George PETICILĂ[2], Dorel HOZA[2]

[1] *Research Center for Studies of Food Quality and Agricultural Products, University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Marasti Blvd, Bucharest, Romania*
[2] *Faculty of Horticulture, University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Marasti Blvd, Bucharest, Romania*
*Corresponding author, e-mail: oana.venat@qlab.usamv.ro

Introduction: *In vitro* multiplication of *Fragaria × ananassa* is essential due to several critical factors affecting agricultural efficiency, genetic consistency, and the crop's overall improvement. When activated charcoal is incorporated into the culture medium, it may enhance regeneration rates, absorb inhibitory compounds, improve root development, regulate phytohormone levels and reduce oxidative stress. Phytohormones play a crucial role as key regulators in plant responses, influencing processes such as cell division, elongation and differentiation.
Aims: The aim of this article underscore the significance of using both activated charcoal and phytohormones in encapsulation of *in vitro* obtained strawberry explants, optimizing synthetic seed regeneration.
Materials and Methods: Young shoots obtained from two-month-old *in vitro*-grown explants of *Fragaria × ananassa* were encapsulated in a 3% sodium alginate solution containing MS medium components and hardened in 100 mM calcium chloride solution. Three different sodium alginate solution variants were utilized: V1 – control, hormone-free; V2 – 1 mg/L BAP, 0.5 mg/L IBA, and 0.1 mg/L GA3; and V3 – 1 mg/L BAP, 0.5 mg/L IAA, 0.1 mg/L GA3, and 1 g/L activated charcoal.
Results: The use of synthetic seed technology, incorporating both activated charcoal and phytohormones, significantly enhanced the regrowth and development of encapsulated *Fragaria × ananassa* 'Albion' explants.
Conclusion: This approach not only improves regeneration rates and root development, but also optimizes the overall cultivation process, demonstrating the critical role of these components in advancing horticultural practices and plant biotechnology.

Keywords: artificial seed, encapsulation, *in vitro* conservation, strawberry

THE EFFECT OF EXPLANT TYPE AND GROWTH REGULATORS ON CALLUS INDUCTION IN *PASSIFLORA QUADRANGULARIS*

Paula OROS, Corina CĂTANĂ* and Maria CANTOR

Faculty of Horticulture and Business in Rural Development, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania
*Corresponding author, e-mail: corina.catana@usamvcluj.ro

Introduction: Passifloraceae are valuable for their biochemical and bioactive compounds and are often used in traditional medicine and pharmacology. Callus culture is a source of secondary metabolite production and flavonoids are the essential bioactive compounds in *Passiflora quadrangularis* (Ingale *et al*., 2010).
Aims: Initiation of callus culture and stabilization of cell suspensions are important steps in obtaining a callus mass for secondary metabolite production *in vitro*. The protocol described here could be used for efficient callus induction in a wide range of *Passiflora* spp.
Materials and Methods: Murashige and Skoog medium supplemented with 2,4-Dichlorophenoxyacetic acid (2,4-D) and Picloram (PIC) in different concentrations and combinations with Benzylaminopurine (BAP) and Kinetin (KIN) were used for culture initiation. A total of 11 treatments and different plant organs as explant sources were tested. Callus proliferation was performed in solid and liquid culture systems. Four weeks after initiation, the callusing rate (%) of explants was determined.
Results: The regenerative response in terms of dedifferentiation was first observed in explants grown on culture media supplemented with 2,4-D and BAP. The interaction of factors showed that internodal segments were callused at 100% on medium containing 2 mg/l 2,4-D and 0.5 mg/l BAP. On this culture medium, the leaf fragments also showed the highest callusing rate (98.33%). For *P. quadrangularis*, the liquid culture system proved to be superior in terms of cell mass and dry matter content, which can be explained by the better access to nutrients and water in a liquid medium.
Conclusion: This research demonstrated that *P. quadrangularis* callus culture is strongly influenced by the plant growth regulators combination, the type of explants and the culture system. The cell suspension obtained is the first step in the secondary metabolite production system.

Keywords: callus, cell suspension, *Passiflora quadrangularis*

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THE INFLUENCE OF GENOTYPE AND CULTURE MEDIUM ON *IN VITRO* PROLIFERATION IN *HEUCHERA* SPP.

Paula OROS, Corina CĂTANĂ* and Cristian Cătălin CIOBANU

Faculty of Horticulture and Business in Rural Development, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania
*Corresponding author, e-mail: corina.catana@usamvcluj.ro

Introduction: The genus *Heuchera* includes perennials prized worldwide in gardens for their ornamental foliage and flowers. *Heuchera* spp. are remarkable for the diversity of leaf colours and the ability to tolerate a variety of environmental conditions, making them a popular choice for gardens and landscaping, especially in areas with cold winters.
Aims: The composition of the culture medium is a defining factor for *in vitro* culture. Although plants of *Heuchera* spp. are continuously increasing in popularity, the information on effective propagation methods are relatively limited. The objective of this study was to evaluate the multiplication capacity of two *Heuchera* genotypes, *Heuchera villosa* 'Silver Gumdrop' (H_1) and *Heuchera* x *hybrida* 'Timeless Orange' (H_2) by testing different culture media.
Materials and Methods: The *in vitro* culture was initiated on two culture medium compositions: Murashige & Skoog, 1962 (MS_0) and Murashige & Skoog, 1962 with Gamborg B_5 vitamins (MSB_5), and the regeneration rate of explants was evaluated. In the multiplication stage, in addition to the two culture medium compositions, the influence of cytokinin benzylaminopurine (BAP) on the plantlets' proliferation was tested.
Results: Among the two culture media used at initiation, MSB_5 resulted in regeneration rates of 9.67% for H_1 and 9.33% for H_2. A similar situation was observed for shoot proliferation, MSB_5 recorded the highest proliferation rates for both genotypes: 5.92 shoots for H_1 and 4.13 for H_2. Supplementing the culture medium with BAP resulted in high vitrification rates.
Conclusion: The study has resulted in the production of large quantities of healthy and homogeneous plants in a short time. Both culture media led to high production efficiencies, which recommends multiplication in *Heuchera* spp. by micropropagation.

Keywords: *Heuchera* spp., *in vitro* culture, shoot proliferation, organogenesis

THE EFFECTIVENESS OF THE PARASITE *ENCARSIA FORMOSA* GAHAN IN COMBATING THE WHITEFLY *TRIALEURODES VAPORARIORUM* WESTWOOD

Daniel POPA*, Ioan-Lion CHIPER, Lidia CHIPER and Laura-Mirabela MĂRGINEAN

SCDL Iernut, str. Energeticianului, 545100, Mures, romania
*Corresponding author, e-mail: scdl_iernut@yahoo.com

Introduction: In the field of vegetables, the irrational application of pesticides, in addition to other disadvantages, leads to the accumulation of toxic residues in the soil, in plants and especially in fruits. Thanks to repeated chemical treatments, especially in protected areas, but also in the field, vegetables have been transformed from real stores of vitamins, into stores of toxic substances.
Aims: Several objectives are general research goals: Protection of plant health; Development of biological and biotechnical means of plant protection; Using the named parasite to control whitefly by releasing the parasite at different rates and establishing its effectiveness.
Material and method: The research was organized in greenhouse conditions at a tomato crop, cycle I, on an area of 7560 m^2. The arrangement of the 5 variants of the experience was in blocks, each variant having four repetitions. The surface of a repetition plot was 180 m^2. Between each repetition of the variants on which the parasites were launched, the repetition of the chemically treated control was interspersed, thus the total surface of one variant was 3600 m^2. The surface of the untreated control version was also of 3600 m^2.
Results: The evolution in the dynamics of parasitism was faster between May 13 and June 11, the percentage of parasitism registering the following values: 25.9-63.7% for the V1 variant, 40.6-77.0% for the V2 variant, 38.3-68.2% for the V3 variant. Between June 21 - July 8, the percentage of parasitism in the dynamics was slower, presenting values of 72.4-84.6% for the V1 variant, 83.8-87.0% for the V2 variant and 85.0-89.4 % in the V3 version. By launching a norm of 180,000 parasites/ha (6 parasites/plant), in two stages, at an interval of 10 days from each other, a parasitism percentage of whitefly larvae of 89.4% was finally obtained, in case before the launches, their numerical density was 22.5 copies/plant.
Conclusions: The research carried out has an innovative character, whereas the unit will implement in vegetable farms integrated management strategies for the protection of vegetables from the attack of pests that cause significant damage, affecting the quality of the fruits.

Keywords: efficacy, egg, fly, parasite

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PRELIMINARY STUDY ON THE INFLUENCE OF POTTING SOIL ON *MAGNOLIA GRANDIFLORA* L. SEED GERMINATION AND PLANT GROWTH

Daniela Sabina POȘTA[1], Giancarla VELICEVICI[1], Ioana Mihaela MĂLĂESCU[1], Marius SILIVĂȘAN[1], Veronica SĂRĂȚEANU[2]*, Tincuța-Marta GOCAN[3], Orsolya BORSAI[3]*, Sandor RÓZSA[3], Ilie-Cosmin CÂNTAR[4] and Roberto Renato BERNARDIS[5]

[1] Faculty of Engineering and Applied Technologies, University of Life Science "King Mihai I" from Timişoara, Romania
[2] Faculty of Agriculture, University of Life Science "King Mihai I" from Timişoara, Romania
[3] Faculty of Horticulture and Business in Rural Development, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania
[4] "Marin Dracea" National Research and Development Institute in Forestry, Romania
[5] Faculty of Horticulture, University of Life Sciences "Ion Ionescu de la Brad" Iași, Romania
*Corresponding author, e-mail: orsolya.borsai@usamvcluj.ro

Introduction: *Magnolia grandiflora* L. is a striking evergreen tree known mostly for its ornamental values given by its white, large and fragrant flowers, being used more and more in landscaping projects, including in temperate climate. Its flowers and leaves have a significant medicinal value, as well with great antioxidant activity and a significant content of sesquiterpene and magnograndins A-I, known for their important cytotoxicity against human cancer cell lines.
Aims: The main aim of this study was to investigate the influence of different types of potting soil on seed germination and plant growth of *Magnolia grandiflora* L.
Materials and Methods: In order to carry out this study, the seeds were removed from the fruits and stored at constant humidity of (80%) and temperature (4 °C) for 90 days. The seeds were then sown in four different types of peat as follow: V1 - Potgrond H peat; V2 – Zelta peat; V3 – Kekkilä peat; V4 – TS 3 peat. After seed germination, the plantlets were monitored and the following morphological characters were determined: plant height, stem diameter, root length, root number, leaf number/plant and leaf surface area. The experiment was carried out in the greenhouse of the Arboriculture Dept. of the Faculty of Engineering and Applied Technology, University of Life "King Mihai I" from Timișoara.
Results: The results showed that V1 - Potgrond H peat stimulated the most plant growth and development, as compared to the other potting soils tested. It has been observed that both root system and aerial part of the plant had the greatest values regarding all the morphological characters investigated.
Conclusion: The potting soils tested had a positive influence on seed germination and plant development.

Keywords: bull bay, potting soil seed conditioning

ROMANIAN GENETIC RESOURCES OF CUCUMBERS - PERSPECTIVES AND CHALLENGES IN THE CONTEXT OF GLOBAL WARMING

Ionela Filona RĂDUCU[1,2], Aurora DOBRIN[1,2]*, Liliana BĂDULESCU[1,2] and Elena Maria DRĂGHICI[1]

[1] *University of Agronomic Sciences and Veterinary Medicine of Bucharest, Romania*
[2] *Research Center for Studies of Food Quality and Agricultural Products, Bucharest, Romania*
*Corresponding author, e-mail: aurora.dobrin@qlab.usamv.ro

Introduction: Genetic resources are particularly valuable collections for the conservation of species with important economic value. Vegetables are essential for the human diet, providing antioxidants, vitamins, minerals and dietary fibres. Global vegetable production increased by 65% from 2000 to 2019, reaching 1.15 billion tons in 2021, cucumber production being of 93 million tons, according to FAO 2022. Water stress represents a significant impediment in vegetables, limiting their growth, development and production.
Aims: Taking into account the above facts, the study focused in understanding the complex interactions between biotic and abiotic stress responses in cucumber, an objective crucial for developing resilient cultivars and ensuring sustainable production.
Materials and Methods: This study synthesizes cucumber responses to abiotic stress, including drought, heat, and salinity. The literature was reviewed to gather data on physiological, biochemical, and molecular responses of cucumber plants under stress conditions. Key parameters discussed include reactive oxygen species (ROS) levels, antioxidant enzyme activities (such as superoxide dismutase (SOD), catalase (CAT), ascorbate peroxidase (APX)), and the expression of stress-responsive genes. Additionally, the roles of nitric oxide and reduced glutathione in stress mitigation are examined.
Results: The areas cultivated with vegetables in Romania have registered a decrease, whereas there are only 23 producer organizations recognized according to MADR. In our country, in 2021, 6260 ha were cultivated with cucumbers. Exposing plants to different stress factors leads to an increase in reactive oxygen species (ROS). The ROS detoxification system comprises both enzymatic and non-enzymatic components. Nitric oxide and Glutathione in reduced form are involved in the protection of plants subjected to abiotic stress. In conditions of thermal stress, in cucumber leaves, enzymes from the SOD/ascorbate-glutathione cycle are activated under deactivation of catalase. The paper emphases the importance of plasma membrane permeability, osmotic potential modification, antioxidant content and specific genes in managing drought tolerance in cucumbers.
Conclusion: Cucumbers represent a food source rich in nutrients and bioactive substances, being used both for food and therapeutic purposes. Therefore, improving the drought tolerance of cucumbers through innovative methods and technologies is very important, by studying specific genes, signal transduction pathways, plasma membrane permeability, osmotic potential modification, antioxidant content, soluble carbohydrates, chlorophyll, ions and the hormones in managing drought tolerance.

Keywords: abiotic stress, biotic stress, enzymes, genetic resources, nutritional quality

POST-HARVEST QUALITY MAINTENANCE IN TWO LOCAL TOMATO POPULATIONS FROM CLUJ COUNTY

Sándor RÓZSA[1], Gheorghe POȘTA[2]*, Alexandru-Ioan APAHIDEAN[1], Lehel LUKÁCS[3], Tincuța-Marta GOCAN[1], Ileana ANDREICA[1] and Ioana MOLDOVAN[3]

[1] Faculty of Horticulture and Business in Rural Development, University of Agricultural Science and Veterinary Medicine, 3–5 Mănăștur Street, 400372 Cluj-Napoca, Romania
[2] Faculty of Engineering and Applied Technologies, University of Life Sciences "King Mihai I" from Timişoara, Calea Aradului 119, 300645 Timisoara, Romania
[3] Horticultural Research Station, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, 400372 Cluj-Napoca, Romania
*Corresponding author, e-mail: posta.gheorghe@gmail.com

Introduction: Tomatoes, regardless of the variety, must be harvested in such a way that their fruits meet the maximum quality characteristics previously established in a certain period of time. This desire is achieved by knowing and directing the factors that influence the color, intensity and evolution of the physiological and biochemical processes, which are externalized by the firmness and commercial appearance of the fruits (Shamshiri *et al*., 2018).
Aims: The behaviour of tomatoes after harvesting depends on a complex of factors whose influence varies depending on the variety, the culture system, the environmental conditions and the duration of keeping the fruits under the influence of high temperatures.
Materials and Methods: The stage of maturity was determined according to the method presented by Kaur and Gupta (2017).
Results: It was found that, as the tomatoes are harvested in a phase closer to consumption maturity, the rate of colouring is faster, especially at the temperature of 20-22 ºC.
Conclusion: The research carried out on the two local populations studied showed that the physical and chemical changes that tomatoes undergo after harvesting are influenced by the degree of maturity at which the harvest is made and the temperature conditions at which the fruits are kept. Thus, the resistance of tomatoes to penetration, depending on the degree of ripening, varies between 3.25 and 4.45 kg/cm^2, and the weight losses vary between 0.75-0.95% in the temperature range 8-10 ºC and 0.85-1.5% at a temperature of 20-22 ºC.

Keywords: degree of ripening, local population, tomatoes

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EFFECT OF THE FRUIT PHENOLOGICAL STAGE ON GERMINATION OF *CAPSICUM* PEPPERS. WAX PEPPER AS A CASE OF STUDY

Eva M. SOLBES-GARCÍA[1], Ana DE LUIS-MARGARIT[2], Ana FITA[3] and Adrián RODRÍGUEZ-BURRUEZO[3]*

[1] Universidad Católica de València San Vicente Mártir (UCV), Escuela Doctorado, Valencia, Spain
[2] UCV, Facultad Veterinaria y Ciencias Experimentales, Dept. Biotecnología, Valencia, Spain
[3] COMAV Institute, Universitat Politècnica de València (UPV), Valencia, Spain
*Corresponding author, e-mail: adrodbur@upvnet.upv.es

Introduction: Spain is a centre of diversity for *C. annuum* and a plethora of ecotypes can be found. Seedbanks and on-farm multipliers play an essential role in their conservation, and knowing the best phenological stage to achieve high germination rates is needed, especially in wax peppers, with a particular ripening process.
Aims: This work aimed to evaluate seed germination of a local ecotype of wax pepper, whereas seeds were collected at different phenological stage, to determine the effect on germination.
Materials and Methods: "Blanco de Villena" seeds, wax pepper grown in Villena (Alicante, Spain) since ancient times, were extracted at 4 phenological stages once the fruits reached final size: i) turning (T, carotenoids <50% surface), ii) almost ripe (AR, carotenoids >75%), iii) fully ripe (FR, turgent fully red) and iv) overripe (OR, fully ripe not turgent). Three blocks of 25 seeds each were sown (in Petri dishes) per stage and germination was evaluated at 10, 14, 17 and 24 days after sowing (DAS).
Results: Seeds from all stages germinated at the end of the experiment (24 DAS), although with remarkable differences. Thus, FR and OR showed the highest germination rates, 62% and 58% respectively, followed by AR (53%) and T (29%). Also, seeds from FR and OR achieved their final germination rates at 14-17 DAS, while a few seeds germinated from T stage achieved final rates at 10 DAS, and very few or no more seeds germinated later.
Conclusion: The study found that FR stage offers the highest germination rate and no earlier stages must be used to prevent low or nil rates.

Keywords: *Capsicumm annuum,* plant diversity, seedbanks, seed technology, seed viability

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STUDY OF THE AGE OF SEEDS ON GERMINATION IN VEGETABLES. *CAPSICUM* PEPPERS AS AN EXAMPLE

Eva M. SOLBES-GARCÍA[1], Ana DE LUIS-MARGARIT[2], Mónica BOSCAIU[3] and Adrián RODRÍGUEZ-BURRUEZO[3]*

[1] *Universidad Católica de València San Vicente Mártir, Escuela Doctorado, Valencia, Spain*
[2] *Universidad Católica de València San Vicente Mártir, Facultad Veterinaria y Ciencias Experimentales, Dept. Biotecnología, Valencia, Spain*
[3] *COMAV Institute, Universitat Politècnica de València (UPV), Valencia, Spain*
*Corresponding author, e-mail: adrodbur@upvnet.upv.es

Introduction: *Capsicum* peppers are known for germination problems, which can be influenced by the fruit phenological stage, stress during fruit development (e.g. low or high temperature), seed drying, etc. Even more, once seeds are extracted and refrigerated, the age of the seeds may play an important role on germination, as sometimes peppers are reported to lose viability in a few years.
Aims: To evaluate germination rates of *Capsicum* accessions at different years of multiplication, and identifying how this factor may affect seed viability in different genotypes.
Materials and Methods: Seeds from California (modern *C. annuum*), Chile Serrano (semiwild *C. annuum*) and ECU-994 (*C. chinense*) accessions, kept at UPV seedbank (refrigerated at 4-5 ºC) and from 3 multiplication times: recent (R, multiplication on 2023), intermediate (I, 2017) and old (O, 2013), were sown in Petri dishes, to evaluate their germination along 28 days after sowing (DAS).
Results: A different behaviour was found among the evaluated genotypes. California seeds showed final germination rates as follows: low (55%), very low (15%) and very high (>95%) from R, I and O lots, respectively. By contrast, very high final germination rates, regardless the age, were found in ECU-994 (80-98%) and, particularly, Serrano (98-100%). We also found that the older the seeds from Serrano and, particularly ECU-994, the higher the germination vigour, as I and O seeds germinated faster than R at 8-14 DAS.
Conclusion: *Capsicum* seeds differ on germination patterns with the age, depending on the genotype. Varietal type-specific studies are advised to determine the ages at which each variety achieves its highest (or lowest) germination rates.

Keywords: breeding, *Capsicum annuum*, diversity, drought, organic farming

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OPTIMIZING THE COMPOSITION OF RED WINES OBTAINED FROM FETEASCĂ NEAGRĂ GRAPES BY REVERSE OSMOSIS

Alexandru Gabriel SUDUC, Cătălin Ioan ZAMFIR, Camelia Elena LUCHIAN*, Lucia Cintia COLIBABA, Tiberiu ANDRIEȘ, Andreea ȚURCANU, Răzvan George NIȚĂ and Valeriu V. COTEA

Faculty of Horticulture „Ion Ionescu de la Brad" Iași University of Life Sciences, Iași, Romania,
*Corresponding author, e-mail: camelia.luchian@iuls.ro

Introduction: Unfavorable vine-growing years due to climate change, with poor quality harvests, often lead to wines that do not reach the quality standards desired by the producer and the consumer. Reverse osmosis can be used on musts to increase the concentration of phenolic compounds, colour compounds and other macromolecules by eliminating water.
Aims: Taking into account former studies, the phenolic structure of wines obtained from Fetească neagră grape variety can be improved by concentrating the must through reverse osmosis.
Materials and Methods: Reverse osmosis was applied to musts obtained from grapes of Fetească neagră, harvested before phenolic or technological maturity from Iasi vineyard in 2022. Wine samples obtained from the same grapes that have reached technological maturity were also obtained, for comparison purposes.
Results: The use of reverse osmosis to concentrate the must has achieved wines that have higher alcohol percentage and higher total acidity than the wine obtained from grapes that had reached phenolic maturity, but have lower density, extract and remaining sugar.
Conclusion: The process of reverse osmosis can be used to improve the physico-chemical structure of wines (alcoholic concentration, total acidity of wines, pH etc).

Keywords: Feteasca neagra, phenolic compounds, reverse osmosis, wine

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RESEARCH ON THE USE OF ENZYMATIC PREPARATIONS FOR THE PROTEIN STABILIZATION OF WINES OBTAINED FROM BUSUIOACA DE BOHOTIN

Andreea TURCANU, Lucia Cintia COLIBABA*, Camelia LUCHIAN, Marius NICULAUA, Catalin ZAMFIR and Valeriu V. COTEA

Ion Ionescu de la Brad University of Life Sciences, Iasi, Romania
*Corresponding author, e-mail: cintia.colibaba@gmail.com

Introduction: The clarity and brightness of wine are essential quality factors, but can be limited by the presence of proteins. It is not sufficient to apply a clearing treatment; stability must last over time despite the wine's storage conditions (Blateyron *et al*., 2007).
Aims: The aim of the research was to evaluate the efficiency of protein stabilization treatments of wines at different stages of their production, using enzymatic preparations.
Materials and Methods: The samples were from Busuioaca de Bohotin variety, vinified in white and rosé were considered. The obtained samples are to be studied in terms of protein stability, aiming to achieve wines with an NTU index < 2, while maintaining the organoleptic aspects (color, taste, aroma) as intact as possible. The obtained samples will be subjected to a classic treatment with bentonite and a conventional treatment with enzyme. Enzymes with protease activity (Aspergillopepsin I) are likely to degrade proteins in must and wine under specific heating conditions (Resolution OIV-OENO 625-2021). The enzyme acts only at a minimum exposure temperature of 80 ºC for a few seconds with the help of a flash detente, which cannot be achieved in most wineries, due to the lack of the necessary equipment. To determine protein stability, the samples will undergo specific analysis involving thermal shock.
Results: It is desired to obtain an NTU index < 2 in the samples treated with enzyme, to achieve a smaller deposit after protein sedimentation, and to obtain a wine with more expressiveness compared to those treated with bentonite.
Conclusion: Research on protein stability has led to the evolution of practices, highlighting a multitude of natural and non-allergenic products. The deproteinizing treatment, with the help of enzymes, could be a real advantage for producers, but the disadvantage of this treatment is given by the temperature at which the treated sample must be taken.

Keywords: Aspergillopepsin, bentonite, NTU, protein stability

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WATER MANAGEMENT SUSTAINABLE SOLLUTION, CASE STUDY FOR A NEW RESIDENTIAL AREA IN CLUJ-NAPOCA

Alida VIȘAN[1] and Denisa JUCAN[2]*

[1]Faculty of Architecture and Urbanism, Technical University of Cluj-Napoca, Romania
[2] Faculty of Horticulture and Business in Rural Development, Department of Horticulture and Landscape Architecture, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania
*Corresponding author, e-mail: denisa.jucan@usamvcluj.ro

Introduction: Cluj-Napoca is the second large city in Romania, after Bucharest, in terms of urban development. Considering the global warming, urbanization and the increment of mineral surfaces, which influences the climate of Cluj-Napoca, by increased temperatures and long dry periods, sustainable solution for rational usage of water must be found and implemented as soon as possible.
Aims: The aim of the project was to design and implement a strategy for harvesting the rainwater from the street and direct it in a vegetal, permeable and aesthetic design that fits in the architecture of a new neighborhood in Cluj-Napoca.
Materials and Methods: The architecture proposed plans, geological studies, terrain slope and the meteorological reports were taken in consideration to calculate the necessary surface of the rain garden. After establishing the shape and the surface, plants were chosen depending on their ecological requirements, aesthetic value and phytoremediation capacity. Architecture and landscape design software were used to create the 2D and 3D plans and perspectives of the rain gardens.
Results: The final architecture plan include multiple small rain gardens design to reduce the pressure form the pluvial drainage public system, by offering a sustainable solution and rational usage of the storm water.
Conclusion: Modern and green systems used in the infrastructure of the cities contribute significantly to the improvement of the environment and the quality life.

Keywords: rain garden, water management, sustainability

SESSION 6: ANIMAL SCIENCE

THE INFLUENCING FACTORS OF PHEASANT MEAT CHARACTERISTICS: A REVIEW

Iuliana Ștefania (BOLOLOI) BORDEI[1], Georgiana Magdalena PÎRLEA[1], Elena Gabriela STAN[1], Ionela Florentina (ENACHE) TOMA[1], Andreea Ionela ZINCA[1] Roxana Elena (VASILIU) ȘTEFAN[1], Carmen Georgeta NICOLAE[1]

[1]Faculty of Animal Production Engineering and Management, University of Agronomic Sciences and Veterinary Medicine, Bucharest, Romania
[*]Corresponding author, e-mail: iulianabordei10@gmail.com

Introduction: Pheasant meat is important for its nutritional benefits, culinary applications, environmental sustainability, cultural significance, and economic contributions. As interest in sustainable and healthy eating grows, pheasant meat stands out as a viable and beneficial option. Understanding the influencing factors of meat characteristic helps in producing high-quality pheasant meat that meets consumer preferences and culinary standards.
Aims: The aim of this paper is to identify the main influencing factors on pheasant meat characteristics. This research synthesizes existing literature, highlighting the relationships between these factors and pheasant meat quality. Additionally, it proposes future research directions to optimize production and meet market demands and consumer preferences.
Materials and methods: The study was structured as a systematic review of specialized literature, focusing on studies published in recent years. Individual variability, growing technology and processing practices influencing pheasant meat quality were analysed. The methodology involved comparing data obtained from various sources to provide a comprehensive evaluation.
Results: The use of optimized dietary regimes and controlled rearing conditions can significantly improve the quality of pheasant meat. Additionally, rearing conditions that reduce stress and provide adequate space for pheasants have had a positive impact on the texture and tenderness of the meat. Post-slaughter management practices, such as rapid cooling and controlled atmosphere packaging, have contributed to preserving meat quality and extending shelf life.
Conclusion: In conclusion, by optimizing rearing factors, along with effective post-slaughter management, can significantly improve the quality of pheasant meat. This study offers valuable insights for sustainable and efficient pheasant production practices to improve the final product quality.

Keywords: nutrition, processing management, rearing conditions, quality meat.

MEASUREMENTS OF LAYING HENS' BEHAVIORAL ADAPTATION IN THERMAL STRESS

Gabriela Maria CORNESCU, Tatiana Dumitra PANAITE and Ana Elena CISMILEANU

Nutrition Physiology Department, National Research and Development Institute for Biology and Animal Nutrition, 077015 Balotesti, Ilfov, Romania
*Corresponding author, e-mail: tatiana.panaite@ibna.ro

Introduction: The behavioural observations require meticulous precision to ensure a comprehensive capture of different interactions among the poultry in normal and thermal stress conditions, to notice subtle behavioural patterns and understand complex social dynamics. (Rosenthal and Rosnow, 2008). Rigorous standards in observation and recording, can enhance the reliability and validity of experimental, contributing to a better understanding of animal behaviour and other related implications (Du Sert et al., 2020).
Aims: The present study analysed the methods of measuring poultry behaviour in response to thermal stress changes essential for animal welfare, production efficiency, product quality, economic impacts, breeding programs, and environmental management enhancement.
Materials and Methods: A complex literature search was conducted to extract the most relevant articles, reports about our topic related to laying hens production, welfare, thermal stress, health consequences, behavioural aspects.
Results: Techniques include observing behaviour in natural or in thermal stress conditions through naturalistic observation and capturing objective records via photographic methods, despite some limitations. Continuous recording tools monitor movement and environmental reactions, while time sampling observe specific behaviour over short, repeated intervals. Focal animal sampling provides in-depth insights into individual behaviour. Infrared thermography offers a non-invasive way to measure body surface temperature, offering a comprehensive framework to understand and manage the impact of thermal stress.
Conclusion: Regular, detailed and precise observation about laying hens' behaviour can help in early identification of thermal stress and stressors, designing effective interventions that can be helpful for farmers to take corrective measures to reduce the economic losses.

Keywords: laying hens, production performances, thermal stress, welfare.

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FISH BIODIVERSITY AND STOCK ASSESSMENT IN THE DANUBE RIVER: INSIGHTS FROM KM 166-175

Angelica DOBRE[1*], Maria Desimira STROE[1], Mirela CREȚU[1], Marilena Florentina LĂCĂTUȘ[1], Floricel Maricel DIMA[1]

[1] *Research and Development Institute for Aquatic Ecology Fishing and Aquaculture Galati, Romania*
[*]Corresponding author, e-mail: sdesimira.icdeapa@gmail.com

Introduction: Fishing activities in the Romanian sector of the Danube River play a pivotal role in both local economies and environmental conservation efforts. Understanding the ecological status of fish species is crucial for sustainable management and conservation strategies.
Aims: This study aims to assess the biodiversity and ecological status of fish in the Romanian Danube sector by calculating key indicators. It also seeks to evaluate fish population for 2024 to establish sustainable conservation measures.
Materials and Methods: Biodiversity indicators including species diversity, evenness, and relative abundance were calculated based on fish capture in 2024. A ten years comparative analyses were conducted on Total Allowable Catch (TAC), reported catches, and fishing effort to understand their temporal dynamics.
Results: The analysis revealed significant trends in TAC, reported catches, and fishing effort, influencing fish populations and overall biodiversity. Stock assessments for five important species were conducted, providing valuable insights into their current status.
Conclusion: The findings underscore the importance of continuous monitoring and adaptive management strategies to sustainably manage fish resources in the face of changing environmental conditions and anthropogenic pressures.
Acknowledgements: The authors are grateful for the technical support of the ADER 14.1.1/*Studies on Monitoring and Evaluating Habitats Specific to Fishery Resources for Determining the Total Allowable Catch, Fishing Effort, Sustainability, and Conservation of Stocks in Relation to Current Climate Changes"* project.

Keywords: *biodiversity indicators, Danube River, ecological status, Fish biodiversity.*

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OVERVIEW ON STRATEGIES TO REDUCE THE CARBON FOOTPRINT IN DAIRY CATTLE FARMS

Marinela ENCULESCU*, Ioana NICOLAE and Madalina MINCU

Research and Development Institute for Bovine, Bucuresti-Ploiesti, km 21, Balotesti, Romania
*Corresponding author: marinelaenculescu2006@yahoo.com

Introduction: Greenhouse gas emissions (GHGe) from the livestock sector represent one of the most pressing environmental issues in agriculture. The largest livestock share of GHGe were shown to result from the digestive processes of ruminants, feed production and manure management.
Aim: To present different GHGe mitigation strategies, with potential impact on reducing the carbon footprint (CF) of dairy cattle farms.
Results: The main options to reduce the CF of dairy farms are centred around four main approaches, as follows: *1) selection* of animals for higher milk yields, reduced enteric methane emissions and improved feed efficiency; *2) herd management* for better animal health, fertility, diet composition and increased longevity; *3) feed production*, with focus on land use, grassland management for carbon sequestration, improving forage quality, reduction in chemical fertilizers and crops rotation; *4) manure management*, with approaches such as manure storing, composting techniques and biogas conversion. Furthermore, in a recent study by Sorley et al. (2024), the farming system was shown to significantly influence the CF, with estimated CF per tonne of fat and protein corrected milk (CF/t FPCM) of 1.129 kg CO_2 equivalent for farms that practice grazing, 1.237 kg CO_2 equivalent for mixed farms and 1.519 kg CO_2 equivalent for farms that practice intensive year-around indoor housing, respectively.
Conclusion: Lowering GHGe in dairy cattle farms is possible throughout the adoption of mitigation practices, adapted to region-specific production system, in order to improve the environmental footprint and sustainability of the sector.

Keywords: carbon footprint, dairy cattle, mitigation practices

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EFFECTS OF PROBIOTIC ADDITION TO MULBERRY LEAVES ON SILKWORM LARVAL AND COCOON TRAITS

Anca GHEORGHE[1]*, Mihaela HABEANU[1], Adela R. MOISE[2], Nicoleta A. LEFTER[3], Melania F. ANDREI[1], Teodor MIHALCEA[1], Daniel S. DEZMIREAN[2]

[1] Research Station for Sericulture Băneasa Bucharest, Romania
[2] University of Agricultural Science and Veterinary Medicine Cluj-Napoca, Romania
[3]National Research Development Institute for Animal Biology and Nutrition, Balotesti, Romania
*Corresponding author, e-mail: anca.gheorghe@scsbaneasa.ro

Introduction: Mulberry leaves, as a single natural feed for silkworms, have a balanced nutritional profile, but due to their availability and chemical composition variations, it may be necessary to add supplements to achieve optimal productive parameters. Probiotics are regarded as a natural nutritional strategy to fortify mulberry leaves with nutrients and improve insect productivity.
Aims: To evaluate the effects of mulberry leaves supplemented with different levels of whey-fed two monovoltine silkworm breeds (S76 and J93) on larval and cocoon traits.
Materials and Methods: A total of 600 silkworm larvae (5th instar) randomly allocated into 6 groups (100 larvae/group) in a 3x2 factorial design were fed for 9 days with dietary treatments consisting of i. mulberry leaves, control (C); ii. C with 3% whey and iii. C with 5% whey. The larval measurements included the weight (LW) and length (LL) at first, 5th, 7th and 9th days, and silk gland weight (SGW) at 5th, 7th and 9th days. The raw cocoon traits determined were weights of cocoon, shell and pupae, shell ratio, longitudinal and transversal axes, and their ratio.
Results: Feeding silkworms with mulberry leaves fortified with 3 or 5% whey did not significantly improve the larval and cocoon traits ($p>0.05$). Breed J93 achieved superior growth and raw cocoon parameters than S76 ($p<0.0001$). A significant effect of days on larval development was noticed between 5 and 9 days of 5th instar, the LW increased by 1.58-fold, LL by 0.84-fold and SGW by 1.99-fold ($p<0.0001$). Interaction between diet, breed and days was significant only for LL ($p=0.020$). Strong positive correlations were found between larval weight and length, SGW with shell weight and shell ratio, cocoon weight with shell and pupae weight, while longitudinal axes were positively moderately correlated with transversal axes and their ratios ($p<0.01$).
Conclusion: The results showed the potential use of whey to mulberry leaves for silkworms to maintain or upgrade biological and productive characteristics.

Keywords: *B. mori*, cocoon traits, larval growth, silk gland, whey addition.

Acknowledgement: This study was supported by MADR – Romania, project ADER no. 24.1.2.

AGRO-INDUSTRIAL BY-PRODUCTS MODULATE THE INTESTINAL MICROBIOTA COMPOSITION IN WEANING PIGLETS

Iulian Alexandru GROSU[1]*, Gina Cecilia PISTOL[1], Daniela Eliza MARIN [1], Ionelia TARANU[1]

[1] *Laboratory of Animal Biology, National Institute for Research and Development for Biology and Animal Nutrition, Calea Bucuresti No. 1, Balotesti, 077015 Ilfov, Romania;*
*Corresponding author, e-mail: grosu.iulian@ibna.ro

Introduction: Rapeseed meal, derived from oil extraction from the rapeseeds of *Brassica napus* and *Brassica rapa* plants, is an excellent nutritional component for piglets. It is rich in proteins, essential amino acids, and key nutrients necessary for piglet growth, making it a suitable alternative to soy protein. When integrated appropriately with other feed components, it ensures a balanced diet.
Aims: Based on scientific literature and their established roles within the core pig microbiota, five critical bacterial genera, namely *Prevotella, Enterobacter, Lactobacillus, Bifidobacterium* and *Clostridium*, were selected as markers for gut health
Materials and Methods: TOPIG piglets were fed for 22 days the experimental diets and euthanized, their colonic digesta preserved for analysis. Microbial DNA extraction was performed using the QIAamp DNA Stool Minikit and qPCR analyses were performed to quantify bacterial genera abundances.
Results: The abundance of these bacteria in colonic samples was assessed using 16S rRNA qPCR analysis. Differences at the level of bacterial genera abundances were registered between the experimental diets.
Conclusion: The results highlight the influence of rapeseed meal on the populations of the selected bacterial genera within the pig gut microbiota.

Keywords: Rapeseed meal, 16S rRNA, pig microbiota.

ASSOCIATIVE EFFECTS OF *RODOTORULA GLUTINIS YEAST* x MULBERRY LEAVES ON THE MORPHO-PRODUCTIVE PARAMETERS OF TWO BREEDS OF SILKWORMS *BOMBYX MORY*

Mihaela HĂBEANU[1], Anca GHEORGHE[1], Adela R. MOISE[2], Mihaela DUMITRU[3], Nicoleta A. LEFTER[3], Melania F. ANDREI[1], Teodor MIHALCEA[1], Daniel S. DEZMIREAN[2]

[1]*Research Station for Sericulture Băneasa- Bucharest, Romania*
[2]*University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania*
[3]*National Research Development Institute for Animal Biology and Nutrition, Balotesti, Romania*
*Corresponding author, e-mail: mihaela.habeanu@scsbaneasa.ro

Introduction: The nutritional value of mulberry leaves is correlated with the morpho-productive performances of silkworms B. mori. Nutrient-sprinkling mulberry leaves is an achievable method to increase cocoon value. Rodotorula glutinis is an oleaginous microorganism that may produce a wide range of metabolites. There is no evidence of using this yeast to silkworms.
Aims: We aimed to assess the morpho-productive performance of RG90 and Maritza III silkworm breeds fed *Rodotorula glutinis* yeast.
Materials and Methods: A bifactorial trial (3x2) was running on 600 larvae belonging to RG90 and Maritza III breads. The measurements were done on first, 5th, 7th, and 9th days (D) during 5th instar and after cocoon formation. Larvae were randomly distributed in 3 groups with 2 replicates: 1) C group fed mulberry leaves; 2) E1 fed C diet and yeast 1x107 concentration; 3) E2 fed C diet and yeast 1x109.
Results: The larval characteristics tend to be impacted by the breed (>1.03 times higher on Maritza III, $0.10<P>0.05$); yeast addition fortified the leaf potential on larval traits (E1>E2>C, P>0.05). Compared to first D, a highly significant increase in larvae was noticed in D9 (>1.74 times). The silk gland was positively correlated with larva length ($r = 0.76$, $P<0.0001$) and larva weight ($r = 0.61$, $P<0.0001$), and depended significantly on breed, whereas diets did not have an impact (P>0.05). The breed significantly influences cocoon parameters except pupa weight and transverse axis. A slight increase (P>0.05) in the cocoon characteristics was noticed by yeast addition.
Conclusion: We demonstrated that the mulberry leaves with yeast allow to silkworms to express and ameliorate their morpho-productive potential (larva, silk gland, and cocoon characteristics), whatever the breed.

Keywords: cocoon, larvae, Rodotorula glutinis, silkworm, yeast.

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INFLUENCE OF GENOTYPE AND SEX ON BODY WEIGHT EVOLUTION OF LAMBS

Cristian Vasile ILISIU[1,2], Elena ILISIU[1,2*], Daniela Rodica MARE[1], Andreea – Hortensa ANGHEL[1], Vasile – Calin ILISIU[1], Dorina NADOLU[1], Krisztina Pál CHIOREAN[2]

[1]Research and Development Institute for Sheep and Goat Palas - Constanta, I. C. Brătianu, 248, 900316 Constanța, Romania
[2]Caprirom Nord Association, Dedradului, 11, 545300 Reghin, Romania
[*]Corresponding author, e-mail: nuti.ilisiu2@yahoo.com

Introduction: To improve meat production to sheep in the last decade, in Romania were used for industial crossings, many specialized breeds for meat production. Berrichon du Cher, Mouton Vendeèn, and Blanc du Massif Central were used in crossings with Tsigai and Tsurcana breeds. The results indicate that lambs produced through crossbreeding outperformed those from local breeds (Borzan et al., 2019).
Aims: The objective of this study was to assess the influence of sex on the growth performances of triraciali lambs obtained from crossings between 75% Blackface x 25% Tsigai sheep mated with the Franch breed Berrichon du Cher, Blanc du Masif Central and Mouton Vendeen and raised intensively under Romanian conditions.
Materials and Methods: A total of 151 R1 crossbreed ewes were divided into four groups and mated with the following rams: group 1 with Berrichon du Cher, group 2 with Blanche du Massif Central, group 3 with Mouton Vendèen, and group 4, the control group, with R1 German Blackface x Tsigai (BFxTI).
Results: The study found that both genotype and sex significantly influenced the growth performance of the lambs. At 28 days, significant differences ($P< 0.001$) were observed between females from group 4 and both males and females from group 1, as well as females from group 3. This trend continued at 56 days, the females from group 4 being heavier than both males and females from groups 1 and 3 ($P< 0.001$). At five months, males from group 1 had significantly higher body weights ($P< 0.001$) compared to females in group 4.
Conclusion: Given the superior growth performance of crossbred lambs, the three French meat breeds could be utilized for crossbreeding with Tsigai purebred ewes and/or other ewes of simple crosses. This approach aims to enhance growth rates and optimize the fattening technology for crossbred lambs.

Keywords: body weight, crossbreed, lamb, performance, Tsigai

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PRODUCTION OF BUFFALO CHEESE VARIETY WITH ACTIVATED CHARCOAL

Andrada IHUȚ[1], Simona OROS[1], Simona PAȘCALĂU[1] Cosmin OPRESCU[1], Eugen RĂDUCU [2] and Camelia RĂDUCU[1]*

[1] Faculty of Animal Science and Biotechnologies, UASMV Cluj-Napoca, Romania
[2] Facultatea de Medicină, Universitatea de Medicină și Farmacie Iuliu Haţieganu Cluj-Napoca, România
*Corresponding author, e-mail: camelia.raducu@usamvcluj.ro

Introduction: Cheese is an extremely versatile food, rich in protein, calcium, vitamins, and probiotics (Lucey, 2008). However, its global consumption varies depending on the species of origin, geographic area, or lactose and acidity content. Improving cheese recipes with various bioactive substances is an ongoing concern to meet consumer needs (Petersen et al., 2024).
Aims: This research aims to reduce the acidity of buffalo cheese using activated charcoal.
Materials and Methods: Three varieties of buffalo cheese were made: one using liquid rennet, another using lactic calcium, and the third using lactic calcium and activated charcoal. We tested these cheeses for moisture content (oven drying), salt content (Mohr method), acidity (Thörner method), and fat content (Van Gulik acid-butyrometric method).
Results: The sample coagulated using lactic calcium had the lowest fat percentage. The addition of activated charcoal to sample 3 significantly reduced the acidity of the fresh buffalo milk cheese compared to the other samples.
Conclusion: The acidity of fresh buffalo cheese can be decreased through the incorporation of activated charcoal.

Keywords: cheese, buffalo milk, active charcoal

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EFFECT OF *ULVA LACTUCA* AS A FEED ADDITIVE ON GROWTH PERFORMANCE AND OXIDATIVE STRESS ON *ACIPENSER STELLATUS* AND *ACIPENSER RUTHENUS*

Alina Nicoleta MACOVEIU[1,2], Mirela CREȚU[1,2] , Maria Desimira STROE[1,2] , Angelica DOCAN[1] , Floricel Maricel DIMA[1, 2] , Lorena DEDIU[1*]

[1] Faculty of „ Dunărea de Jos" University of Galati , 47 Domnească Street, RO 800008, Galati , Romania
[2] Institute of Research and Development for Aquatic Ecology, Fishing and Aquaculture" 54 Portului Street, Galați, Romania
[*]Corresponding author, e-mail: lorena.dediu@ugal.ro

Introduction: Green marine macroalgae represent a valuable natural resource that largely remains underexploited. In recent years, research on these organisms has garnered significant attention due to their remarkable potential as a prolific source of unique bioactive compounds.
Aims: Our study aimed to evaluate the potential positive impact of *Ulva lactuca* on two sturgeon species, *Acipenser ruthenus*, and *Acipenser stellatus*, raised in a recirculating aquaculture system.
Materials and Methods: The hematological profile was determined using the routine methodology of fish hematology. Oxidative Stress Parameters were quantified by determination of the Lipid peroxidation levels (MDA), Serum lysozyme activity (LZM), and total antioxidant capacity (TAC).
Results: At the end of the experiment, no significant changes in growth performance were observed. However, positive effects on oxidative stress parameters were noted in the experimental groups supplemented with 10% *Ulva lactuca*.
Conclusion: Based on these results, it can be concluded that the reduced digestibility of proteins was reflected in lower growth performance and poorer feed utilization. Nevertheless, it supports the notion that *Ulva lactuca* flour supplemented in the diet contributed to improving oxidative metabolism in fish.

Keywords: Bioactive compounds, oxidative stress, sturgeon, *Ulva lactuca*

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RESEARCH ON THE EVOLUTION OF MILK PRODUCTION IN ANGLO-NUBIAN PRIMIPAROUS GOATS ACCORDING TO THE AGE OF THE FIRST MATING

Laura MARINICA[1,2], Dorina NADOLU[3], Andreea Hortanse ANGHEL[3], Alexandru Gabriel VARTIC[2,3] and Constantin PASCAL[2]

[1] ANCC CAPRIROM, Constanta, Romania
2 Faculty of Food and Animal Sciences, Iași University of Life Sciences, România
[3] ICDCOC Palas, Constanta, Romania
[*]Corresponding author, e-mail: dorinanadolu@yahoo.com

Introduction: Goat breeding and farming is expanding globally, playing a crucial role in the animal products sector. Goat milk production is prized for its high nutritional value, as goat milk is similar in composition to human breast milk. Anglo-Nubian goats are noted for their adaptability to different climatic conditions and their versatility in producing high-quality milk and meat. The Anglo-Nubian breed is prized for its production of high-fat, high-protein milk, ideal for the production of quality cheeses. These goats also have docile behavior and are easy to manage, making them ideal for various types of farms.
Aims: The aim of this paper is to analyze the impact of age at first calving on milk production and lactation duration.
Materials and Methods: The milk production was followed in 30 Anglo-Nubian primiparous goats, divided into 3 groups according to age at first breeding. Two groups (B1, B3) consisted of goats aged 7-8 months (B1) and 17-18 months (B3), which were bred during the normal breeding season. Goats in B2, with an age at first breeding of 12-13 months, were bred in the off-season, with a lactation period of 12-15 months. These goats, included in improvement works, were exploited in a traditional system, benefiting from similar climatic conditions and forage resources.
Results: Data analysis revealed significant differences in total milk production between batches. The main results are presented in the following table:

	BATCH 1	BATCH 2	BATCH 3
Total milk production (kg)	535.8	1132.41	543.6
Daily average (g)	2722.4	2775.9	2688.1
Lactation duration (days)	282.3	417.6	289.2

Conclusion: Maximizing milk production in Anglo-Nubian goat farms can be done by: counter-season breeding with prolonged lactation and by introducing 7-8 months old female kids to counter-season breeding.

Keywords: goats, primiparous goats, milk production

RESEARCHERS ON THE INFLUENCE OF SUCKLING PERIOD OF KIDS ON PRODUCTIVE EFFICIENCY IN SAANEN GOATS

Dorina NADOLU[1], Zoia Camelia ZAMFIR[1*], Andreea Hortanse ANGHEL[1], Laura MARINICA[2], Cristian Vasile ILIȘIU[3] and Elena ILIȘIU[3]

[1] ICDCOC Palas, Constanta, Romania
[2]ANCC CAPRIROM, Constanta, Romania
[3] Experimental Basis Reghin, Mures of ICDCOC Palas, Constanta, Romania
[*]Corresponding author, e-mail: zamfirzoica@yahoo.com

Introduction: The growing demand for goat milk and goat milk products has led Romanian breeders to purchase specialized goats for milk production, mainly from the Saanen and Alpina breeds. After the imports, a challenge was the choice of an efficient exploitation system that would allow the utilization of fodder resources and already known technologies, with a minimal impact on the adaptability of these breeds to the specific geoclimatic conditions of our country.
Aims: The research of the present study followed the productive efficiency in the first three months of lactation in Saanen goats exploited in intensive, semi-intensive and traditional systems, by estimating the amount of milk yield obtained from them.
Materials and Methods: The research was carried out on 45 Saanen goats in their 3rd lactation, divided into three groups corresponding to the three exploitation systems: intensive system with ultra-early weaning of kids, semi-intensive system with separation of kids from goats at age of 30 days and traditional system with keeping the kids next to the goats for 3 months. The amount of milk obtained from these goats was monitored during the 3 months, establishing the optimal option of breastfeeding the kids with increased yield for obtaining commodity milk for human consumption.
Results: The amount of milk milked was 3851.79 kg in batch 1 (intensive exploitation), 2687.44 kg in batch 2 (semi-intensive exploitation) and 868.86 kg in batch 3 (traditional exploitation), and the average daily productions for each stage statistically processed with the jaspAnova program is presented in the following table:

	Intensive system	Semi-intensive system	Traditional system
Mean	3077.197[a]	2195.067[b]	687.643[c]
Std. Deviation	249.601	1237.941	575.338
Minimum	2880.330	919.670	198.200
Maximum	3357.930	3391.800	1321.400

a/b – p=0,269, a/c – p=0,006, b/c – p=0,065

Conclusion: In dairy goat farms where the aim is to maximize milk production, it is recommended to apply intensive or semi-intensive exploitation.

Keywords: weaning kids, milk production.

EFFECTS OF FEEDING FERMENTED VS. UNFERMENTED RAPESEED CAKE ON THE THIGH MEAT QUALITY

Tatiana Dumitra PANAITE[1]*, Gabriela Maria CORNESCU[1], Mihaela DUMITRU[2], Dan RAMBU[2], Ana Elena CISMILEANU[1] and Smaranda Mariana TOMA[2]

[1]Nutrition Physiology Department,
[2]Animal Nutrition and Biotechnologies Laboratory,National Research and Development Institute for Animal Nutrition and Biology, Balotesti, 077015, IF, Romania
**Corresponding author: tatiana.panaite@ibna.ro*

Introduction: Soybean meal is the most popular protein source for poultry. Fermented rapeseed meal is an alternative to soybean meal (Raboanatahirina et al., 2021) due to the presence of probiotics, prebiotics or organic acids, with beneficial antimicrobial and immunoregulatory effects (Szmigiel et al., 2021), improving the nutritional qualities of poultry meat.
Aims: The study investigated the effect of feeding fermented *vs.* unfermented rapeseed cake as protein alternative to soybean meal substitution in broiler diet on the nutritional thigh meat quality.
Materials and Methods: The 35-day trial was performed on 300, day-old ROSS 308 chicks (3 groups, 4 replicates/group, 25 broilers/replicate), in an experimental hall on permanent wood shaves litter (16 broilers/m2) to evaluate the effects of dietary replacement of soybean meal (SBM) with fermented (FRSM) vs. unfermented (RSM) rapeseed cake on thigh broilers meat quality. All groups received the same basal diet (10 days). After that, the broilers diets were either not supplemented (including a corn-SBM) or supplemented with RSM or FRSM at 200 g/kg diet/experimental group. Six chicks/groups were slaughtered at the end of the trial, and thigh samples were collected for chemical analyses assessment.
Results: Broilers fed diets containing FRSM significantly ($P < 0.001$) increased the value for the collagen content (1.08%) compared with SBM (0.93%) and RSM (0.89%). The FRSM diet reduced ($P < 0.0001$) the total saturated fatty acid contents (21.78 g/total FAME) compared with SBM (24.25 g/total FAME) and increased total omega 3 polyunsaturated fatty acids content (3.30 g/total FAME) compared to the other ($P < 0.05$) groups (2.57 g/total FAME for SBM, 3.9 g/total FAME for RSM, respectively).
Conclusion: Replacing SBM with FRSM could be used as a partial substituent to soybean meal in broiler diets, because did not affect the protein quality, improving meat quality by increasing the fatty acid profile and decreasing (($P \geq 0.05$) the cholesterol content.

Keywords: broiler, cholesterol, collagen, fermented rapeseed cake, fatty acid.

COMPARATIVE RESEARCH ON BREEDING VALUE PREDICTION FOR CALVING SCORE IN BEEF BREED CATTLE

Rodica Stefania PELMUS[1]*, Mircea Catalin ROTAR[1], Mihail Alexandru GRAS[1], and Cristina VAN

[1] *National Research-Development Institute for Animal Biology and Nutrition, 1, Calea Bucuresti, 077015, Balotesti, Romania*
[*]Corresponding author, e-mail: pelmus_rodica_stefania@yahoo.com

Introduction: The calving ease is a trait with discrete variation. The threshold model is good for the analysis of calving ease but linear model was used more often because is simpler (Grosu et al., 2013).
Aims: The aim of this study was to compare threshold model and individual animal model in genetic evaluation of population of Charolaise breed for calving score to choose the best method.
Materials and Methods: The data consists in records of 2935 calves for calving score from Charolais breed. The pedigree covered 6022 animals: 2935 calves, 194 bulls and 2893 dams from Romanian Breeding Association for Beef cattle. The breeding values and heritability were estimated with threshold model and individual animal model. The Spearman's correlation was used for show the degree of agreement between the ranking of the same individuals for breeding values using threshold and animal model.
Results: The mean for calving score was 1.35± 0.010. The breeding values for calving score for calves were ranged between -0.2749 and 0.3606 with threshold model and between -0.099 and 0.144 with individual animal model. The relative breeding values for the best cattle were between 126 and 131 estimated with threshold model and from 125 to 129 estimated with individual animal model. The Spearman's rank correlation was high 0.9915. The heritability for calving score was 0.139 using threshold model and 0.079 individual animal model.
Conclusion: The threshold model and animal model are good for genetic evaluation of population of Charolais beef cattle.

Keywords: Beef breed**,** calving score, individual animal model, threshold model.

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SEASONAL VARIATIONS IN THE PREVALENCE OF ECTOPARASITIC INFESTATION IN CIPRINID FRY FROM FISH FARM

Daniela RADU[1*], Mioara COSTACHE[1], Nino MARICA[1], Alin BARBU[1], Carmen Georgeta NICOLAE[2], Silvia RADU[1]and Nicoleta DOBROTĂ[1]

[1]Fish Culture Research and Development Station Nucet, 549 Principala Street, 13733, Roumania
[2]University of Agricultural Sciences and Veterinary Medicine, Faculty of Animal Science, 59 Marasti Street, 011464 Bucharest, Romania
[*]Corresponding author, e-mail: dradu64@yahoo.com

Introduction: The influence of biotic factors is of particular importance on the state of aquatic organisms. Fish ectoparasites are one of the most important problems associated with fish farming. Certain environmental conditions are more favorable to disease, of which, water temperature is important associated with the onset of disease. The periodicity (seasonality) of the appearance of many of the parasitic invasions, caused by parasites that develop in intermediate hosts or in water, is another important aspect that can represent potential threats to fish farming.
Aims: This study aims to determine the ectoparasitic prevalence for myxozoans, ciliophores, monogeneans and crustaceans, identified in juvenile cyprinids (carp, grass carp, silver carp and bighead carp) collected from ponds of the Nucet Experimental Base that belong to SCDP Nucet and to establish correlations with the main parameters of quality of the culture environment depending on the analyzed season.
Materials and Methods: Ichthyopathological analysis, collection and processing of parasitological material were performed according to generally accepted methods in ichthyoparasitology.
Results: Have been identified 14 species of ectoparasites. Myxozoa are represented by a single species (*Myxobolus pavlovskii*); ciliophores include six species (*Trichodina sp*., *Trichodinella sp*., *Ichthyophthirius multifiliis*, *Epystilis sp*., *Apiosoma piscicola* and *Chilodonella cyprini*), monogeneans group include four species (*Gyrodactylus sp*., *Dactylogirus sp*., *Diplozoon paradoxum* and *Diplostomum spathaceum*) and crustaceans are represented by three species (*Lernaea cyprinacea*, *Argulus foliaceus* and *Sinergasilus sp*.).
Conclusion: Knowing the aspects related to the seasonal variation of the prevalence of ectoparasites correlated with the influence of environmental factors can help to identify the necessary measures for an adequate management of fish health so as to reduce economic losses and increase fish production.

Keywords: *Ciprinidae* fry, ectoparasite, fish farm, prevalence, seasonal variation.

RESEARCH ON THE IMPACT OF CLIMATE CHANGE ON THE CONTROLLED REPRODUCTION OF CULTURED FISH

Silvia RADU, Nicoleta Georgeta DOBROTĂ, Mioara COSTACHE, Daniela RADU, Gheorghe DOBROTĂ, Nino MARICA, Alin Constantin BARBU

Fish Culture Research and Development Station Nucet, Romania
street Principală, no. 549, 137335,
* Corresponding author email: dobrota19dng@yahoo.com

Introduction: Climate change is a global phenomenon, which endangers natural, social and economic systems through their sensitivity and vulnerability to climate factors. The direct effects of climate warming can be understood through fatal declines in an organism's performance in growth, reproduction, feeding, immune competence, behaviors and competitiveness.
Aims: The objective of the work was to study the impact of climate change on the controlled reproduction of the main cultured fish species within the experimental base Nucet – S.C.D.P. Nucet.
Materials and Methods: The study was carried out over a period of 10 years (2014-2023) and includes: the evolution of water and air temperature; average annual precipitation; the main hydrochemical water quality parameters; the beginning and end of the reproductive cycle in the main crop species, the number of degree days accumulated between two reproductive cycles. The study involved the following stages: collection of samples from the field; analysis of samples in the laboratory; processing and interpretation of the data obtained from the analyses.
Results: The average monthly air temperature in the breeding season of most cultured fish species (March, April, May, June) recorded the lowest values in 2022 (13.45 ^{0}C), and the average monthly water temperature of recorded the lowest values in the year 2021 (16.195^{0}C). The analysis of the multi-year variation of the annual precipitation indicates the occurrence after 2017 of a series of dry years, due to the decrease in the amount of precipitation, corroborated with the tendency of the average annual temperature to increase.
Conclusion: Establishing the impact of climate change on the controlled reproduction of cultured fish helps to test all species in terms of their adaptation abilities and to find genetic resources at the population level, to form a basis for the generation of new species. Thus, the appearance of new species on a national scale can be expected, which will have the adaptive capacity to withstand thermal variations.

Keywords: climate change, controlled reproduction, fish.

EXPERIMENTAL MODEL FOR ASSESSING THE IMPACT OF ELECTROMAGNETIC RADIATION ON BEES

Vasilică SAVU[1]*, Agripina ŞAPCALIU[1], Viorel FĂTU[1]

[1]*Research Development Institute for Plant Protection, Bucharest, Romania*
[*]Corresponding author, e-mail: sapcaliuagripina@yahoo.com

Introduction: Electromagnetic radiation emitted by modern technologies (such as mobile phones and 4G/5G wireless antennas) can influence the behavior and health of bees (Ratnieks and Carreck, 2010), with consequences on the ecosystem-food chain (Cucurachi, S. *et al.* 2013).
Aims: The research aimed to investigate the interaction of electric and electromagnetic fields with the anatomy, physiology, and behavior of bees under laboratory conditions.
Materials and Methods: The electromagnetic emission of a GSM antenna was measured at an apiary in Dâmbovița County at six different distances from the emitting antenna (0-10 m, 100 m, 300 m, 500 m, 800 m, 1000 m). Based on the measured values, an experimental model was created in the laboratory at a 1:1000 scale to simulate field emission conditions. The laboratory experimental model consisted of a GSM signal amplifier for 2G, 3G, and 4G with emission wavelengths of 0.9, 1.2, and 2.1 GHz. The signal strength was measured using the Extech 480846 equipment, and the emission spectrum was analyzed with the UNI-T UTS1032T spectrum analyzer (9 kHz-3.2 GHz). The following parameters were monitored over a 5-day exposure period: temperature, humidity (%), bee mass (mg), noise level (dB), emission level (milliwatts/m²), and mortality rate (%), compared to a control. Bee samples were collected, examined by veterinary-health authorities with the issuance of analysis reports, and bee monitoring sheets were completed.
Results: At the apiary site in Dâmbovița, located 1000 m from the emitting antenna, the average emission values were 1.3 milliwatts/m², and the maximum values were 2.0 milliwatts/m². In the laboratory, the emission had an average value of 4.5 milliwatts/m² and a maximum value of 9.6 milliwatts/m². The maximum mortality level under laboratory conditions was reached at equivalent distances of 500 m (90%) and 800 m (99%).
Conclusion: In this situation, the major risk of bee impairment, with a maximum mortality level, was reached at distances between 500 and 800 m from the emission source.

Keywords: bees, behavior, electromagnetic radiation

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ANALYZING THE IMPACTS OF CLIMATE CHANGE ON THE HYDROLOGICAL REGIME AND AQUATIC BIODIVERSITY OF THE DANUBE RIVER

Desimira Maria STROE[1*], Angelica DOBRE[1], Mirela CRETU[1], Magdalena TENCIU[1], Elena Ioana COMAN[1], Neculai PATRICHE[1]

[1]*Research and Development Institute for Aquatic Ecology Fishing and Aquaculture Galati, Romania*
[*]Corresponding author, e-mail: angelica.dobre85@yahoo.com

Introduction: Climate change poses significant challenges to global ecosystems, particularly impacting freshwater environments such as the Danube River. Understanding these impacts is crucial for effective conservation and management strategies.
Aims: This study aims to analyse the variability of the hydrological and physico - chemical parameters of the Danube River. Additionally, biodiversity indicators are calculated to assess changes in aquatic ecosystem.
Materials and Methods: Data on hydrological and physico - chemical parameters were collected from monitoring stations along the Danube, specifically in the Chiscani area, Braila County, at Km 169-197 from the river source.
Results: The study reveals significant temporal trends in both hydrological and chemical parameters of the Danube River. Seasonal variations in chemical parameters exhibit distinct patterns, highlighting potential impacts on aquatic ecosystems. Biodiversity indices indicate varying responses of aquatic communities to changing environmental conditions.
Conclusion: Climate-induced alterations in the hydrological regime of the Danube River have profound implications for aquatic biodiversity. Conservation efforts should consider these findings to mitigate future impacts and ensure the sustainability of this vital European river system.

Keywords: biodiversity indicators, chemical parameters, climate change, Danube River, hydrological parameters.

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SESSION 7: BIOTECHNOLOGY

REVITALIZING ROMANIAN AGRICULTURE: INSIGHTS INTO PROPAGATION, UTILISATION AND GENETIC CONSERVATION OF MULBERRY

Ecaterina-Daniela BACIU, Adela-Ramona MOISE, Gabriela-Maria NEGREA-BACI and Daniel Severus DEZMIREAN

Faculty of Animal Sciences and Biotechnologies, University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca, Romania
*Corresponding author, e-mail: daniela.baciu@usamvcluj.ro

Introduction: Mulberry (*Morus* sp.) is a versatile woody plant with significant potential to enhance Romanian agriculture through its diverse applications, including environmental remediation, genetic resource conservation, and sustainable farming practices. This study examines the critical role that mulberry can play in fostering a more resilient and sustainable agricultural system in Romania. Mulberry has proven particularly effective in various farming applications, contributing to the overall improvement of agricultural practices (X et al., 20..).
Aims: The research focuses on advanced propagation techniques to grow and conserve different mulberry varieties. These methods enable the large-scale production of mulberry plants while preserving their genetic diversity, which is essential for maintaining robust populations capable of adapting to Romania's diverse climatic conditions. The study also explores the potential of mulberry in vertical farming systems, which could transform urban agriculture by utilizing less space and resources, thereby providing a sustainable solution for urban food production.
Materials and Methods: The mulberry variety used in this research is Kokuso 21, a Japanese cultivar acclimatized in 2015 at the USAMV Campus in Cluj-Napoca, Romania. Seeds collected from this variety were used in both micropropagation protocols and vertical farming trials.
Results: The study's findings demonstrate the successful implementation of micropropagation and vertical farming techniques under Romanian climatic conditions, suggesting that mulberry can be effectively integrated into modern agricultural systems in the region.
Conclusion: This abstract highlights the significance of mulberry in revitalizing Romanian agriculture. By investing in the research and development of mulberry propagation and utilization techniques, Romania can advance its agricultural practices, making them more sustainable and adaptable to future challenges.

Keywords: agriculture, micropropagation, *Morus* sp., mulberry, vertical farming.

BIOMORPHOLOGY AND REGENERATION OF GENUS ACTINIDIA

Nina CIORCHINĂ[1], Maria TABĂRA[1]*, Natalia ONICA[1], Tatiana CALALB[2]
Liliana BĂDULESCU[3], Oana VENAT[3], Ioana-Cătălina NICOLAE[3]

[1]"Alexandru Ciubotaru" National Botanical Garden (I), Moldova State University,
[2]Department of Pharmacognosy and Pharmaceutical Botany, Nicolae Testemițanu University,
[3]Research Centre for Studies of Food and Agricultural Products Quality, University of Agronomic Sciences and Veterinary Medicine, Bucharest, Romania.
*Corresponding author, e-mail: maria.tabara@gb.usm.md

Introduction: Species from the genus Actinidia Lindl. are significant emerging fruit crops in temperate regions. Actinidia species are a rich source of phytonutrients and antioxidants, which protect cells against aging. The most effective method for the mass propagation of valuable Actinidia cultivars is through *in vitro* tissue culture.
Aims: Development of protocols for the regeneration of some Actinidia cultivars using both vegetative propagation methods and *in vitro* culture techniques.
Materials and Methods: Actinidia species maintained for over fifty years in "Alexandru Ciubotaru" National Botanical Garden (Institute) collection were chosen as the subjects of study. Plant material was regenerate by vegetative propagation and through *in vitro* culture.
Results: The multiplication of Actinidia species was carried out vegetatively by lignified and semi-lignified cuttings and by seeds, in three substrate variants and by micropropagation. The efficacy of vegetative propagation was evaluated through physical and morphological parameters, while for *in vitro* micpropagation (Cachiță-Cosma D. 2004), various standard culture media supplemented with hormones was tested.
Conclusion: Testing the media for different explants of the species A. *kolomikta* and A. *arguta* showed that the optimal regenerative potential is achieved by inoculating the apical meristem with a first leaf primordia.

Keywords: Kiwi, micropropagation, hormones.

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BUFORIN DERIVATIVES: SYNTHESIS AND ANTIMICROBIAL PROSPECTS

Andreea GOSTĂVICEANU[1,2], Cristian MOISĂ[1], Andreea LUPITU[1], Lucian COPOLOVICI[3], Dana-Maria COPOLOVICI[3*]

[1] Institute for Interdisciplinary Research, Aurel Vlaicu University of Arad, Elena Dragoi St. 2, Arad, 310330, Romania
[2]Biomedical Sciences Doctoral School, University of Oradea, Univversity St. 1, Oradea, 410087, Romania
[3]Faculty of Food Engineering, Tourism and Environmental Protection, Aurel Vlaicu University of Arad, Elena Dragoi St. 2, Arad, 310330, Romania
*Corresponding author, e-mail: dana.copolovici@uav.ro

Introduction: Antimicrobial peptides are short molecules known for combating pathogens and penetrating cell membranes (Roshanak et al. 2020). Buforin IIb, a potent peptide with 21 amino acids, exhibits strong antimicrobial and cell-penetrating abilities. These properties make Buforin IIb and its derivatives promising for biotechnological applications, such as targeted therapies where improved cellular delivery enhances efficacy and precision (Tolos et al. 2024).
Aims: This study aims to synthesize and optimize the production of two Buforin derivatives, confirm their purity and composition through analytical techniques, and explore their potential for further research in biotechnological applications.
Materials and Methods: Buforin derivatives were synthesized using solid-phase peptide synthesis method on an automated assisted synthesizer. Peptide cleavage from the resin was performed in the Razor device. The derivatives were purified using high-performance liquid chromatography (HPLC-DAD) and characterized with matrix-assisted laser desorption/ionization time-of-flight mass spectrometry (MALDI-TOF-MS) and analytical chromatography to confirm their molecular weights, structures and purity. Antimicrobial activity against bacteria (*Escherichia coli*, *Pseudomonas aeruginosa*, *Salmonella typhimurium, Staphylococcus aureus*) using the broth microdilution method was performed.
Results: The synthesis process produced high-purity Buforin derivatives, as evidenced by clear HPLC peaks and expected molecular weights from MALDI-TOF-MS, respectively. The peptides presented very good activity against tested microorganisms.
Conclusion: The obtained peptides in very good yield presented antimicrobial activity against tested bacteria. Subsequent research will assess their bioactivity and explore their potential for biotechnological applications.

Keywords: antimicrobial activity, buforin derivatives, peptide synthesis.

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EFFECTS OF *RHIZOPHAGUS IRREGULARIS* ON *ECHINACEA PURPUREA* ROOT BIOMASS AND PHENOLIC CONTENT

Martin IAKAB[1,2], Erzsébet DOMOKOS[2], Csilla ALBERT[3] and Francisc Vasile DULF[1]*

[1] Faculty of Agriculture, University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca, Romania
[2] Faculty of Technical and Human Sciences Târgu Mureş, Sapientia Hungarian University of Transylvania, Romania
[3]Faculty of Economics, Socio-Human Sciences and Engineering, Sapientia Hungarian University of Transylvania, Romania
*Corresponding author, e-mail: francisc.dulf@usamvcluj.ro

Introduction: *Echinacea purpurea* is a widespread medicinal plant that has been the focus of several studies, and its bioactive compounds have been shown to have positive effects on the human health. Recent findings indicate that arbuscular mycorrhizal fungi (AMF) have the capacity to modify the quantity and quality of secondary metabolic products within the host plant.
Aims: The aim of this research was to investigate the effect of AMF *Rhizophagus irregularis* on biomass and phenolic derivative production in *E. purpurea* roots.
Materials and Methods: Greenhouse and an open field experiment were conducted with two- year old *E. purpurea* plants inoculated with *R. irregularis*. In the greenhouse experiment three different soil types and sterile peat were used. Root colonization was estimated by determining the percentage frequency as the total of root segments containing at least one of the fungal structures. HPLC analyses for phenolic compounds were performed on dried roots of *E. purpurea* plants.
Results: The highest percentage of root colonization was found on stagnic Luvisol. No significant differences in fresh and dry root biomass were observed between AMF-treated and control plants on the same substrate. The highest values for root biomass were observed on open field stagnic Luvisol. Based on HPLC analysis, five phenolic acids were detected in the roots, of which chicoric acid was the most abundant. The AM treatment on sterile peat resulted in a threefold increase in caftaric acid and a twofold increase in caffeic acid, while a twofold increase in cynarin content was also observed in the field experiment. Caftaric acid and echinacoside content was significantly reduced in AMF plants on gleyic calcaric Fluvisol.
Conclusion: In conclusion, the AM fungi *R. irregularis* can be used to increase the phenolic content of *E. purpurea* roots without negatively affecting root biomass in the open field stagnic Luvisol, where the highest phenolic contents were observed.

Keywords: AMF, *Echinacea purpurea*, plant-fungi interaction, *Rhizophagus irregularis*.

EFFECTS OF INCREASING LEVELS OF ANTHROPIZATION AND LAND USE ON NOSEMA SPP. SPORE LOADS

Cristina Gabriela MATHE[1], Tudor Nicolas TERNAR[1], Gianluca ALBANESE[1,2*], Alexandru Ioan GIURGIU[1*], Otilia BOBIȘ[1], Claudia PAȘCA[1], Melinda Maria TÓFALVI[1], Antonio DE CRISTOFARO and Daniel Severus DEZMIREAN[1]

[1] *Faculty of Animal Science and Biotechnologies , University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca, Romania*
[2] *Department of Agriculture, Environmental and Food Sciences,, University of Molise, Via De Sanctis, 86100 Campobasso, Italy*
[*]Corresponding authors, e-mail: g.albanese@unimol.studenti.it alexandru.giurgiu@usamvcluj.ro

Introduction: The honeybee is one of the most important pollinating insects, but its survival is threatened by biotic (e.g., lack of floral resources or emerging pests) and abiotic (e.g., urbanization) factors. In addition, high population density in hives could negatively affect the health status of bees.
Aims: Investigate the presence of *Nosema spp*. as a function of apiary size, beekeeping practices, proximity between apiaries, and land use.
Materials and Methods: Bee samples were taken from several apiaries in Cluj County and subjected to microscopic analysis to assess their level of infestation according to the OIE Manual. Land use was assessed using the Corinne Land Cover package and through this, the different types of environments to which the bees have access based on their flight area were analyzed.
Results: Based on the microscopical analysis of Nosema spores we can observe differences in the level of infestation between apiaries. This high variability might be correlated not only with environmental stressors but also with beekeeping practices.
Conclusion: The high difference in the level of infestation between apiaries suggests that preventive measures need to be taken to control the spread of Nosemosis. There is a clear difference in the level of infestation of apiaries that have overlapping flight areas, which can be attributed to natural factors, human intervention and inside colony factors.

Keywords: beekeeping, Corinne Land Cover, land use, *Nosema spp*.

CELL-PENETRATING PEPTIDES: MICROWAVE-ASSISTED SPPS SYNTHESIS AND CHARACTERIZATION

Cristian MOISA*[1], Andreea LUPITU[1], Lucian COPOLOVICI[2], Dana-Maria COPOLOVICI[2]

[1]*Institute for Interdisciplinary Research, Aurel Vlaicu University of Arad, Elena Dragoi St. 2, Arad, 310330, Romania*
[2]*Faculty of Food Engineering, Tourism and Environmental Protection, Aurel Vlaicu University of Arad, Elena Dragoi St. 2, Arad, 310330, Romania*
*Corresponding author, e-mail: moisa.cristian@yahoo.com

Introduction: Cell-penetrating peptides (CPPs) are short peptides that facilitate the delivery of various molecular cargo across cell membranes [1]. Solid phase peptide synthesis (SPPS) is known to be a suitable technique widely used in research and when is assissted by microwave it accelerates chemical reactions, enhances efficiency and yield while reducing synthesis time and overall generated waste [2].
Aims: The aim of this study is to synthesize and optimize the production of cell-penetrating peptides, followed by their characterization using advanced analytical techniques to confirm their purity and composition.
Materials and Methods: The peptides were synthesized using the Liberty Blue (CEM) automated microwave peptide synthesizer using a solid-phase peptide synthesis (SPPS) method. The resulting peptides were then thoroughly analysed to confirm their purity, composition, and structural integrity using matrix-assisted laser desorption/ionization (MALDI) mass spectrometry (MALDI-TOF Biotyper Sirius, Bruker) and ultra-high-performance liquid chromatography (UHPLC) (Shimadzu).
Results: Cleavage was performed using a Razor equipment, and MALDI-TOF-MS analysis confirmed that the peptides' molecular weights were consistent with the values calculated from the synthesizer sequence. UHPLC results displayed sharp, well-defined peaks with minimal impurities, further validating the peptides' high purity.
Conclusion: Both MALDI-TOF-MS and UHPLC consistently confirmed the successful synthesis of peptides, with molecular weights matching the expected values and exhibiting high purity. These results validate the effectiveness of the synthesis process and the reliability of the analytical techniques employed.

Keywords: cell-penetrating peptides, microwave-assisted synthesis, MALDI-TOF-MS, solid-phase peptide synthesis, UHPLC

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PROBIOTIC LACTIC ACID BACTERIA STRAINS AS A KEY TO ENHANCING HONEYBEE HEALTH IN APICULTURE

Adriana Cristina URCAN[1], Adriana CRISTE[1], Alexandru GIURGIU[1]
Daniel Severus DEZMIREAN[1]

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[1]*Faculty of Animal Science and Biotechnology, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania.*
[*]Corresponding author, e-mail: adriana.urcan@usamvcluj.ro

Introduction: Honeybees are critical for global agricultural ecosystems, but their populations have been declining due to diseases and environmental stressors. Conventional treatments involving antibiotics and chemicals are becoming less effective due to resistance, highlighting the need for sustainable alternatives. Lactic acid bacteria (LAB) are emerging as potential probiotics for bee health, offering benefits such as pathogen inhibition and improved gut microbiota balance.
Aime: The primary objective of this study was to evaluate the probiotic potential of three LAB strains—*Lactiplantibacillus plantarum, Lactobacillus acidophilus*, and *Apilactobacillus kunkeei*—for their ability to enhance bee health. Specific evaluations included co-culture interactions, biofilm formation, antimicrobial activity, and their resilience to simulated gastrointestinal conditions.
Materials and Methods: Three LAB strains were tested for probiotic properties, including their ability to form biofilms, resistance to high osmotic concentrations, and antagonistic activity. Co-culture experiments were conducted to assess strain compatibility. Their survival under simulated bee gastrointestinal conditions was examined, and antimicrobial activity was tested against common bee pathogens. Biofilm formation and antioxidant activity were also measured.
Results: The co-culture experiment demonstrated no antagonistic activity between the LAB strains, confirming their compatibility in a mixed probiotic formulation. The LAB strains showed robust biofilm formation and high survival rates under high osmotic stress and simulated gastrointestinal conditions. Additionally, the LAB mix exhibited superior antimicrobial and antioxidant activities compared to individual strains.
Conclusion: The study concluded that a combination of *L. plantarum, L. acidophilus,* and *A. kunkeei* could be a promising probiotic solution for enhancing honeybee health. The LAB mix demonstrated improved biofilm formation, antimicrobial, and antioxidant properties, suggesting that it can support honeybee resistance to pathogens. Future studies should focus on in vivo testing to confirm these findings.

Keywords: Lactic acid bacteria, probiotics, honeybees, bee pathogens, *Lactiplantibacillus plantarum, Lactobacillus acidophilus, Apilactobacillus kunkeei.*

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ANTIOXIDANT POTENTIAL OF MEDICINAL PLANT EXTRACTS

Lidia-Ioana VIRCHEA[1], Cecilia GEORGESCU[2*] Monica MIRONESCU[2], Adina FRUM[1] and Felicia GLIGOR[1]

[1] Faculty of Medicine,"Lucian Blaga" University of Sibiu, Romania
[2] Faculty of Agriculture Science, Food Industry and Environmental Protection, "Lucian Blaga" University of Sibiu, Romania
[*]Corresponding author, e-mail: cecilia.georgescu@ulbsibiu.ro

Introduction: Polyphenols are secondary metabolites from plants with a variety of biological activities, such as antioxidant, antibacterial, antineoplastic, etc (Foss, 2022).
Aims: The aim of our study is to compare the total polyphenol content and the antioxidant activity of two types of alcoholic extracts from medicinal plants.
Materials and Methods: Dried aerial parts of *Mentha longifolia* L., *Thymus serpyllum* L., *Achillea millefolium* L. and buds of *Pinus sylvestris* L. were subjected to ultrasound extraction with CH_3OH : H_2O 70 : 30 and CH_3CH_2OH : H_2O 70 : 30, respectively. The total polyphenol content (TPC) was analysed by Folin-Ciocâlteu method. The antioxidant capacity (AC) was determined by DPPH (2,2-difenil-1-picrilhidrazil) (Georgescu, 2022) and FRAP (Ferric Reducing Antioxidant Power) (Vicaș, 2015) tests .
Results: The TPC and the AC of hydromethanolic extracts were higher. Hydromethanolic extract of *M. longifolia* L. presented the highest polyphenol content of 0.3272 mg gallic acid equivalents/g dry weight (dw) and the best potential to reduce DPPH (75.85%). FRAP test shows that the hydromethanolic extracts proved an antioxidant capacity of more than 15 μmol Trolox equivalents (TE)/g dw, while the hydroethanolic extracts had an antioxidant power of more than 5.5 μmol TE/g dw. Other studies from literature reported similar results.
Conclusion: The analysed extracts are a source of bioactive compounds with antioxidant potential, which should be further studied for the development of products to combat oxidative stress.

Keywords: antioxidant, plants, polyphenols

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SESSION 8: VETERINARY MEDICINE - FUNDAMENTAL AND PRECLINICAL SCIENCES

THE NEPHROPROTECTIVE EFFECT OF *CORNUS MAS* AND *SORBUS AUCUPARIA* FRUIT EXTRACTS IN GENTAMICIN-INDUCED NEPHROTOXICITY IN WISTAR RATS

Mara AURORI[1], Alexandra Iulia DREANCĂ[1], Andreea Georgiana MOROHOSCHI[1], Mihaela COTUL[1], Adrian Florin GAL[1] and Sanda ANDREI[1]*

[1] *Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania*

*Corresponding author, e-mail: sandrei@usamvcluj.ro

Introduction: Despite its well-documented nephrotoxicity, gentamicin is nevertheless widely used in both humans and animals. Medicinal plants provide a vital supply of natural antioxidants that may potentially reduce the renal oxidative stress induced by gentamicin. *Cornus mas* and *Sorbus aucuparia* might be such medicinal herbs, which were discovered to be abundant in bioactive chemicals and possess antioxidant properties.

Aims: The aim of this paper was to examine the *in vivo* nephroprotective effect of *Cornus mas* and *Sorbus aucuparia* fruits in gentamicin-induced nephrotoxicity, with particular attention to their antioxidant activity in relation to oxidative stress.

Materials and Methods: The experiment had been conducted for 21 days. Forty-eight adult male Wistar rats were used, and randomly assigned into 6 experimental groups. The subjects received subcutaneous treatment with 50 mg/kg gentamicin and oral administration of *Cornus mas* and *Sorbus aucuparia* fruit extracts in doses of 40 mg/kg and 10 mg/kg, respectively. Samples of blood and urine were collected on days 1, 11, and 21. On the 22nd day of the experiment all subjects were painlessly sacrificed and kidney samples were collected. Blood analysis included the measurement of renal conventional biomarkers (BUN and creatinine), specific renal biomarkers (CysC and KIM-1) and markers of the nitro-oxidative stress (CAT, SOD, GPx, TAC, MDA and NO). Urine analysis consisted of measuring the urinary iNAG activity. Furthermore, fragments of kidney tissue were sectioned, processed, and stained with Goldner's trichrome. The slides evaluation was performed and renal lesions were classified according to a histopathological score.

Results: Significant increases in BUN, creatinine, CysC, KIM-1 and iNAG levels were seen in the group treated with gentamicin. Following the extracts treatment, substantial decreases in creatinine, KIM-1 and iNAG were observed. CysC levels ultimately began to rise and were comparable to those of the gentamicin batch. The antioxidant therapy significantly lowered CAT and GPx, and substantially raised SOD and TAC. Additionally, the concentrations of MDA and NO were considerably lowered by both extracts. Histopathological examination revealed that the renal tissue of the gentamicin-treated rats showed important alterations. Following the administration of extracts, notable changes were seen, with the majority of the renal parenchyma appearing unchanged.

Conclusion: *Cornus mas* L. and *Sorbus aucuparia* L. fruits have been shown to possess nephroprotective effects in gentamicin-induced nephrotoxicity *in vivo*, demonstrating excellent nephroprotection and a noteworthy tubular protective effect.

Keywords: *Cornus mas L., Sorbus aucuparia L.,* natural antioxidants, gentamicin-induced nephrotoxicity, nitro-oxidative stress

NITROGEN BALANCE AND URIC ACID EXCRETION IN LOHMANN-BROWN HENS FED DIETS WITH DIFFERENT CRUDE PROTEIN AND METABOLIZABLE ENERGY LEVELS

Mădălina CIOARIC (DEGENARO)[1*], Rosalie BĂLĂCEANU[2], Andrei Tudor KACENCO[1], Ivona ZĂBAVĂ[1], Ilinca IOZON[3] and Nicolae DOJANĂ[1]

[1]U.A.S.V.M. of Bucharest, 59 Marasti Blvd., District 1, 011464 Bucharest, RO
[2]D.S.V.S.A. Ilfov, 8 Ion Ionescu de la Brad str., District 1, 013811 Bucharest, RO
[3]U.A.S.V.M. Cluj Napoca, 3-5 Mănăștur str., 400372 Cluj Napoca, RO
*Corresponding author email: degenaro.madalina@gmail.com

Introduction: Crude protein excess in diets can lead to increased nitrogen in manure, increasing the risk of environmental pollution.
Aims: The aim of this paper was to determine the effect of different levels of crude protein and /or metabolizable energy in the diets on laying performance and nitrogen balance in Lohmann layers.
Materials and Methods: Four groups of 20-week-old Lohmann hens were fed diets supplemented on ME and CP, expressed as higher (H) or lower (L): group HME/HCP (2,820 kcal ME/16.7% CP), group HME/LCP (2,820 kcal/14.8% CP), group LME/HCP (2,690 kcal/16.7% CP) and group LME/LCP (2,690 kcal/14.8% CP). A control group was fed a commercial diet (2,754 kcal ME/15.5% CP). Experimental feeding lasted from 20 to 32 weeks of age. Egg production (egg weight and laying percentage) and feed consumption were monitored and egg mass and feed conversion ratio (FCR) were calculated. Nitrogen in egg, and uric acid and total nitrogen in manure were analysed.
Results: Egg production was significantly improved in HME/HCP group. FCR was 1.89 g/g in HCP groups, significantly lower (P=0.013) versus control (2.03 g/g), and 2.08 g/g in LCP groups (P=0.140). High level of ME combined by low level of CP in HME/LCP group diet did not significantly change egg production. The amount of uric acid excreted by the HCP groups was 40% higher versus LCP groups (P=0.000) and the excreted uric nitrogen was 24.2% higher in HCP versus LCP groups (P=0.001). HCP groups excreted 0.43 g/cap./day more total nitrogen versus LCP groups (P=0.001) and retained 0.21 g/egg mass more nitrogen versus LCP groups. The ME-supplements did not modify the amount of nitrogen excretion.
Conclusion: The CP diet supplements can increase faecal nitrogen excretion and egg-retained nitrogen. Effects on laying performances depend on CP level and CP/ME ratio in the diet.

Keywords: crude protein, laying hen, metabolizable energy, nitrogen balance, layer performance.

ARE EXOTIC PETS HIDING RESISTANT BUGS?

Smaranda CRĂCIUN[1*], Cristiana Ştefania NOVAC[1], Zsuzsa KALMÁR[1], Cosmina BOUARI, Ioana Adriana MATEI[1], Nicodim Iosif FIŢ[1], George Cosmin NADĂŞ[1]

[1] *Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania*
[*]Corresponding author, e-mail: smaranda.craciun@student.usamvcluj.ro

Introduction: The increasing demand for exotic animals presents new challenges for vets who must effectively care for, diagnose and treat a wide range of animal species (Romero, 2024).
In exotic animal medicine, there is limited information on antimicrobial resistance. As a result, animals treated with antimicrobials might acquire and be colonized by resistant bacteria (Prandi, 2023).
Aims: The aim of this study was to identify bacterial species in exotic animals and evaluate their antibiotic resistance profiles to understand the prevalence of resistant strains.
Materials and Methods: Samples from 22 exotic pets were analyzed, isolating and identifying 27 strains with the Vitek 2 Compact system, as well as testing the antibiotic susceptibility and determining the MIC.
Results: Of the 27 bacterial isolates from 12 genera, Staphylococcus was the most prevalent with 10 strains. Among these, 14 were Gram-positive and 13 Gram-negative. The most resistant Gram-negative strain was *Citrobacter freundii*, while *Sphingomonas paucimobilis* and two *Escherichia coli* strains were the most susceptible. For Gram-positives, *Staphylococcus hominis* ssp. *hominis* had the highest resistance, and *Streptococcus agalactiae* was the most susceptible.
Conclusion: The study identified a range of bacterial species in exotic animals, with notable resistance concerns. These findings highlight a serious threat posed by antibiotic-resistant strains and underscore the need for vigilant antibiotic stewardship and ongoing monitoring to prevent the spread of resistance.

Keywords: antibiotic resistance, exotic animals, MIC, Vitek 2

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MONITORING AND RISK ASSESSMENT OF PESTICIDE RESIDUES IN IMPORTED FRESH PRODUCE: A CASE STUDY ON TOMATOES AND EGGPLANTS

Gheorghe Valentin GORAN*, Emanuela BADEA, Ionuț Răzvan DOBRE, Nicoleta CIOCÎRLIE

Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine of Bucharest, Romania
*Corresponding author, e-mail: gheorghe.goran@fmvb.usamv.ro

Introduction: In recent years, the rise in pesticide residues in foods has heightened consumer risk due to varying pesticide quality and concentrations. While pesticides control pests to boost yields, their toxic properties have raised significant public health concerns (Selim et al., 2023). Tomatoes and eggplants are essential vegetables in consumers' diets, being frequently eaten both raw and cooked, respectively (Meng et al., 2022). Therefore, assessing pesticide levels in these vegetables is crucial to ensure food safety and protect consumers' health (EFSA, 2021).
Aims: The main purpose of this paper is to determine the levels of pesticides in imported tomatoes and eggplants, using standardized analytical methods. In addition, the aim is to compare the results obtained with the maximum permissible limits in order to assess the potential risks to consumers.
Materials and Methods: The extraction of the pesticide residue from the imported tomato and eggplant samples was done with solvents by liquid-liquid partition, the pesticide residues being determined by gas or liquid chromatographic methods coupled or not with the mass spectrometer.
Results: In imported tomato samples, the following substances used as pesticides were determined: DDT, λ-cyhalothrin, Fenvalerate, Acrinathrin, Tebuconazole, Myclobutanil, Bromuconazole, Propiconazole, Tetraconazole, Chlorpyrifos-methyl, Chlorothalonil, Methidathion, Metribuzin. Most of the samples came from Turkey, from where there is a major import, while the import from other European countries, such as Albania, Spain, Hungary, and Macedonia, was lower.
Conclusion: The levels of the concentrations detected do not exceed the legal limit imposed by the legislation in force. Samples from Turkey, a country outside the European Union, have a higher pesticide content per product compared to those from EU countries.

Keywords: eggplants, gas chromatography, liquid chromatography, pesticides, tomatoes

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NON-REGENERATIVE ANEMIA – DIAGNOSTIC CRITERIA IN DOGS

Alina Diana HASAS[1], Naëlle BERTHIAUX[1], Bogdan SEVASTRE[1]*

[1] *Faculty of Veterinary Medicine, University of Agricultural Science and Veterinary Medicine Cluj-Napoca, Romania*
* Corresponding author, email: bogdan.sevastre@usamvcluj.ro

Introduction: Non-regenerative anemia in dogs is a condition where the bone marrow is unable to produce sufficient red blood cells to replace those lost or destroyed. This type of anemia can arise from multiple causes, including trauma, chronic inflammation, cancer, infectious diseases, or parasitic infections.
Aims: This study examined the challenges associated with reticulocyte counts and sought to underscore their importance. It evaluated whether clinical assessment alone might be sufficient in certain cases by analyzing the role and necessity of reticulocyte counts in diagnosing non-regenerative anemia.
Materials and Methods: In this study, we selected 72 dogs of various breeds and ages based solely on their hematological diagnoses. The selection process spanned two years, encompassing all cases of non-regenerative anemia recorded in the pathophysiology register at the Faculty of Veterinary Medicine, Cluj-Napoca, throughout 2022 and 2023. The data was then analysed using Microsoft Excel.
Results: The study observed a higher prevalence of non-regenerative anemia in dogs over 10 years old, with no conclusive racial predisposition due to the small sample size, although a recurrence was noted in Bichons, Labradors, and Shepherds. There was a notable predominance of males, raising questions about hormonal influences, particularly since 85% of the dogs were not sterilized. Clinical assessments highlighted the importance of using capillary refill time (CRT) over mucous membrane color for evaluating anemia, as well as the relevance of reticulocyte counting, which should be performed more frequently by veterinarians, especially in older, anemic dogs. The study also underscored the high inflammation rate in non-regenerative anemia, emphasizing the need for a comprehensive diagnostic approach.
Conclusion: In summary, non-regenerative anemia, with its diagnostic diversity, requires special attention and a personalized approach for each patient.

Keywords: nonregenerative anemia, dogs, reticulocytes.

ANESTHESIA MANAGEMENT FOR SOFT TISSUE SURGERY IN BRACHYCEPHALIC PATIENTS

Iulia-Maria HEGER[1*], Cosmin Petru PEȘTEAN[1] and Ioan MARCUS[1]

[1] *Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine, Cluj*
[*]Corresponding author, e-mail: iulia.heger@usamvcluj.ro

Introduction: Brachycephalic dogs are often associated with upper airway obstruction, digestive side effects and altered thermoregulation (1). In order to establish a safe anaesthetic protocol, all variables regarding clinical changes should be taken into consideration.
Aims: This paper aims to evaluate the management of anaesthesia in brachycephalic patients, considering possible breed-related disorders and predispositions.
Materials and Methods: 21 brachycephalic patients were admitted in the clinic. Out of the 21, 7 had undergone soft tissue surgery. After performing a general clinical examination, each patient was given an anaesthesia chart in which the patient's identification data, patient assessment, apparatus and monitoring regarding anaesthesia technique and substances used in premedication, induction and maintenance, post-anesthesia care were noted. Monitoring was accomplished by: ECG, pulse oximeter, capnograph, blood pressure cuff.
Results: Midazolam was used to reduce anxiety levels and provide muscle relaxation. It was generally administered both i.v and i.m due to patient reactivity (2). Doses ranged between 0.1-2 mg/kg. Butorphanol (0.1-0.3 mg/kg) was used to achieve analgesia. For induction, the study showed that ketamine administered in low doses (0.05-1.5 mg/kg) may be an ideal induction agent with minimal adverse cardiovascular effects. Also, propofol was administered "on effect" to facilitate the intubation process. Isoflurane was the maintenance agent of choice. 28.57% of the patients experienced hypothermia and were hypotensive.
Conclusion: Based on various models of anaesthetic protocols in the current study, a specific protocol has been adapted. It can be successfully used in the anaesthesia of brachycephalic dogs, minimizing the risks associated with the anatomical changes characteristic of the breed and the toxicity of the substances used.

Keywords: analgesia, anesthesia, brachycephalic, protocol

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DSS-INDUCED ACUTE INTESTINAL INFLAMMATION IN RATS: HISTOLOGICAL FEATURES

Ilinca IOZON*, Adrian-Florin GAL, Maria-Cătălina MATEI-LAȚIU, Vasile RUS and Laura Cristina ȘTEFĂNUȚ

Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania
*Corresponding author, e-mail: ilinca.iozon@usamvcluj.ro

Introduction: The administration of various substances, including dextran sodium sulfate (DSS), is able to induce enterocolitis, with the presence of local and systemic inflammatory signs (Gaudio et al., 1999).
Aims: The objective of this study was to identify quantitative and qualitative changes in goblet cells, in rats, after inducing intestinal inflammation by oral administration of DSS solution.
Materials and Methods: Ten male Wistar rats were divided in two groups: experimental and control. Intestinal inflammation was induced in the first group, by oral administration of 5% DSS solution in water, while the animals from control group received only water, both being administered *ad libitum* for 7 days. During necropsy, were collected samples from the stomach, jejunum and colon that underwent fixation. Later, the regular paraffin-processing technique was utilised and stained eventually by Goldner's trichrome method. Tissue samples were analysed, and both morphometric and statistical analysis were performed. The statistical analysis was performed (T and One way ANOVA tests) in order to certify the differences observed.
Results: The clinical signs manifested (diarrhoea, hematochezia, discomfort) by rats began on day 3 of oral administration of the 5% DSS solution. The histological examination of small intestine revealed lesions ranging from desquamative to necrotic jejunitis, including coagulative necrosis of the apical pole of the villi. At the level of large intestine were identified multifocal desquamative areas, discrete oedema of the lamina propria and increased cell apoptosis. The morphometric analysis revealed hypertrophy of the goblet cells in the experimental group, both at the level of jejunum and colon.
Conclusion: The present study results suggest that the used experimental protocol determined the appearance of acute inflammatory lesions at the level of both small and large intestine, extending from desquamative areas up to more severe necrotic lesions, predominantly at the jejunal level.

Keywords: histological examination, acute intestinal inflammation, goblet cells

IN VITRO STUDIES ON THE CYTOTOXIC EFFECTS OF METAMIZOLE, 4-METHYLAMINOANTIPYRINE AND 4-AMINOANTIPYRINE ON LIVER CELL LINES

Georgiana-Iulia LUPU[1*], Emoke PALL[1], Mihai CENARIU[1] , Monica Irina NAN[1] and Sanda ANDREI[1]

Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania

[*]Corresponding author, e-mail: georgiana-iulia.lupu@usamvcluj.ro

Introduction: Metamizole (dipyrone) is a commonly used non-opioid analgesic in both human and veterinary medicine. Despite its widespread use, its safety profile is controversial, particularly due to the risk of agranulocytosis and potential hepatotoxicity. Metamizole is rapidly metabolised in the liver to its primary metabolite, 4-methylaminoantipyrine (4-MAA), which further transforms into 4-aminoantipyrine (4-AA). These metabolites are implicated in the drug's analgesic effects but may also pose risks to liver health.

Aims: Given the lack of conclusive data, this study aims to explore the cytotoxic effects of metamizole and its metabolites on liver cell lines, particularly focusing on potential liver damage and the mechanism of toxicity. Understanding the implications is essential for safe clinical use, particularly in post-operative pain management.

Materials and Methods: This study explores the cytotoxic (MTT) and pro-apoptotic effects of metamizole and its primary metabolites, 4-methyl-amino-antipyrine (4-MAA) and 4-amino-antipyrine (4-AA) on LX-2 liver cell lines. These metabolites contribute to both the therapeutic and adverse effects of the drug. We aim to elucidate the mechanisms underlying potential hepatotoxicity, focusing on cell viability and apoptosis induction. Metamizole was tested at five concentrations (100, 200, 400, 600, 1000 µg/ml), while the metabolites were tested at two concentrations (100, 1000 µg/ml).

Results: Our findings indicate that cell viability decreases in a dose-dependent manner, with significant reductions observed at higher concentrations. The highest cytotoxicity was seen with 4-AA and 4-MAA, causing notable apoptosis at the concentration of 1000 µg/ml. The study concludes that metamizole and its metabolites can induce liver cell damage, emphasizing the need for caution in its use and further research to ensure safe clinical application.

Conclusion: These findings indicate that metamizole and its metabolites can induce liver damage through direct cytotoxic effects.

Keywords: hepatotoxicity, metabolites, metamizole, liver cell lines

ARE GILL RACKERS INVOLVED IN TASTE PERCEPTION AND FOOD INGESTION FOR *GOBIO CARPATHICUS* (VLADYKOV, 1925)? A DEBATE SUSTAINED BY HISTOLOGICAL ARGUMENTS

Maria-Catalina MATEI-LATIU[1], Calin LATIU[2*], Vasile RUS[1], Adrian Florin GAL[1]

[1]*Faculty of Veterinary Medicine, Department of Cell Biology, Histology and Embryology, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania*
[2]*Faculty of Animal Sciences, Department of Fundamental Sciences, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania*
[*]Corresponding author, e-mail: calin.latiu@usamvcluj.ro

Introduction: The feeding behaviour of fish is drastically influenced by fooding availability and dietary preferences. In omnivorous fish, such as the Carpathian gudgeon (*Gobio carpathicus*), chemoreception plays an important role in feeding and morphological adaptations may be observed in several regions of the body. However, it is not clearly known if the fish need to feel the taste before swallowing the food (Genten et al., 2009; Lagler et al., 1967).
Aims: The present study aims to describe the receptors for taste perception and their distribution at the level of the gill rackers, underlining their importance in food sorting behaviour.
Materials and Methods: Paired gills were harvested from Carpathian gudgeon *Gobio carpathicus* Vladykov, 1925 and immersed in 10% buffered formalin. The samples were processed according to the current paraffin embedding technique and stained with Goldner's trichrome method.
Results: The obtained results suggest that the Carpathian gudgeon presents, up to a point, the common gill morphology. However, on the the pharyngeal face of the gills, more exactly on the gill rackers, are present several structures with an onion-like shape, disposed through the surface of the epithelium. Those elements consist of sensorial cells, sustained by sustentacular and basal cells, forming a taste bud. Due to their disposition on the inner surface of the gills, those structures may act like a sorter, enhancing the rackers' sieve activity.
Conclusion: The histological findings suggest that the Carpathian gudgeon, a common omnivorous fish, may use taste reception at the level of the gill rackers before swallowing the food.

Keywords: Carpathian gudgeon, feeding behaviour, gills, histology, taste buds

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THERAPEUTIC USE OF TULATHROMYCIN IN OVINE BACTERIAL PATHOLOGIES, FIELD FINDINGS

Carmen Ramona MOLDOVAN[1], Mihai MADRU[1], Oana ROTAR[1], Lucie NICOLLE[1], Alexandra DREANCĂ[1], Smaranda CRACIUN[1], Ioana MATEI [1], Ioan MARCUS[1]

[1]*Faculty of Veterinary Medicine, University of Agricultural Science and Veterinary Medicine Cluj-Napoca, Romania*
Corresponding author, e-mail: alexandra.dreancă@usamvcluj.ro

Introduction: Bacterial diseases in sheep are a major concern for the farming industry worldwide, compromising the health and productivity of flocks. Increasing resistance to antibiotics, exacerbated by their intensive use, poses a major challenge in veterinary medicine.
Aims: The aim of this field study was to evaluate the efficacy of tulathromycin in the treatment of bacterial strains isolated from 35 sheep, in Cluj County after their identification. A field case regarding sudden mortality in 2 days old sheep was also described.
Methods: Several bacterial strains were *isolated and identified from nasal throwing* and organs prelevated post necropsy regarding young sheep. V-tech method and minimum bacterial concentration (MIC) were carried out for the identification of bacteria and Draxxin's antimicrobial potential.
Results: 22 bacterial strains were identified, of which 12 were resistant to tulathromycin. Our samples showed that the most sensitive strains were *Neisseria spp*, *Acinetobacter urssingii* and *Staphylococcus spp*. On the other hand*, Enterococcus spp.* showed the greatest resistance. Escherichia coli was responsible for septicemia in the 2 days old sheep, tulathromycin in this case being sensitive.
Discussions: The first testing of Draxxin for such use targeting specific small ruminant pathologies, other than the respiratory ones, provides the originality of the study.
Conclusions: This study highlights the promising efficacy of tulathromycin against bacterial infections in sheep and paves the way for more targeted treatment strategies, while highlighting the need for continued monitoring of bacterial resistance.

Keywords: Draxxin, bacterial strains, field study, sheep medicine

BIOCHEMICAL EFFECTS OF DONKEY MILK CONSUMPTION IN MURINE MODELS

Andreea MOROHOSCHI[1] * and Sanda ANDREI[1]

[1] *Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine, Cluj-Napoca*

*Corresponding author, e-mail: andreea-georgiana.morohoschi@student.usamvcluj.ro

Introduction: Donkey milk has a unique composition that can affect various biochemical parameters in the blood after ingestion. It is similar to human milk in terms of nutritional content and is known for being rich in certain nutrients and bioactive compounds.

Aims: The research aims to differentiate the unique nutritional compositions, immune-modulating effects and possible health benefits of these two dairy products. Specifically, it focuses on assessing alterations in blood biochemistry, immune responses, antioxidant levels and lipid profiles after administering donkey milk and donkey whey. The findings may offer valuable insights into the therapeutic potential of donkey-derived dairy products for improving health outcomes and inform their use in dietary and clinical applications.

Materials and Methods: Rat models were used for the study. The rats were divided into groups and given either donkey milk or donkey whey. A control group received no treatment. Donkey milk and whey were administered by gavage at specified doses over a 21-day period. Blood samples were collected at baseline and after the treatment period. Biochemical analyses were performed to measure blood glucose levels, lipid profiles, antioxidant status and immune markers.

Results: Donkey milk's high lactose content can cause an increase in blood glucose levels. Additionally, being rich in whey protein, donkey milk promotes the presence of essential amino acids in the blood, which supports protein synthesis and enhances muscle repair and growth. Compared to cow's milk, donkey milk has a lower fat and cholesterol content, making it less likely to significantly raise LDL cholesterol levels. It may even improve lipid profiles by increasing HDL cholesterol. Furthermore, donkey milk contains bioactive compounds such as immunoglobulins and lysozyme, which can help reduce inflammation and modulate immune markers.

Conclusion: Overall, the consumption of donkey milk can lead to a variety of changes in blood biochemistry, depending on the individual's health status and baseline nutritional levels.

Keywords: Biochemical analyses, donkey milk, donkey whey.

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INSIGHT ON COCKER SPANIELS' EXTERNAL EAR MICROFLORA

Cristiana-Ștefania NOVAC[1]*, Dumitru TOLICO[1], Smaranda CRĂCIUN[1], George Cosmin NADĂȘ[1], Cosmina Maria BOUARI[1], Sorin RĂPUNTEAN[1] and Nicodim Iosif FIȚ[1]

[1] *Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania*
[*]Corresponding author, e-mail: cristiana.novac@usamvcluj.ro

Introduction: Canine otitis externa is one of the most commonly encountered conditions in veterinary practices. Individuals with long hairy ears, narrow external canal and increased moisture, such as Cocker spaniels, are more prone to developing inflammation and bacterial/yeast infection, due to the disruption of normal microbiota.
Aims: The aim of the present study was to evaluate the external ear microflora from otitis-predisposed dog breed Cocker Spaniel and test the susceptibility to selected antibiotics and antimycotics, as well as to identify strains and compare results from healthy and dogs with otitis externa.
Materials and Methods: 35 dogs from different regions of Romania (n=28), Republic of Moldova (n=6) and Poland (n=1) were sampled, aged between 4 months-13 years old. Microbiological analysis was performed by using culture-dependent methods for bacterial and yeast isolation (Columbia sheep blood and Sabouraud dextrose agar). Isolated strains were phenotypically identified on Vitek® 2 Compact (bioMerieux, France) and antimicrobial susceptibility testing was done according to EUCAST protocol (Kirby-Bauer method), using 6 antibiotic and 7 antimycotic-impregnated disks.
Results: 80% of samples yielded a positive bacterial culture, whereas the percentage for yeast isolation was 22.86%. The most prevalent bacterial genera were *Staphylococcus (S. aureus, S. pseudintermedius, S. lentus. S. warneri)* 43.18%, followed by *Bacillus* (11.36%) and *Escherichia* (9.09%). Other isolates included *K. pneumoniae*, *Moraxella osloensis, E. faecium*, *P. mirabilis, Ps. aeruginosa* and *Pluralibacter gergoviae.* The mycological exam yielded a single species, *Malassezia pachydermatis*. The most efficient antimicrobials included Florfenicol and Marbofloxacin. Bacteria showed a high level of resistance against Cephalexin and Polymyxin B.
Conclusion: External ear revealed a diverse microbial flora, both in otitis and otitis-free dogs, suggesting that Gram-negatives could be part of normal microbiota, alongside *Malassezia* and other cocci.

Keywords: Cocker spaniel, dog, microflora, otitis

A HIDDEN THREAT: A CASE REPORT ON PHEOCHROMOCYTOMA IN A HORSE (*EQUUS FERUS CABALLUS*)

Romelia POP [1]*, Dragoș HODOR[1], Cristian CRECAN[1], Iancu MORAR[1], Alexandru Florin LUPSAN[1], Zsofia DARADICS[1], Mirela Alexandra TRIPON[1], Denisa BUNGĂRDEAN[1], Otilia BULMEZ[1], Maria POPESCU[1], Valeria CIULU-ANGELESCU[1] and Alexandru-Flaviu TĂBĂRAN[1]

[1] *Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania*
*Corresponding author, e-mail: romelia.pop@usamvcluj.ro

Introduction: Pheochromocytoma is a rare, but clinically significant neoplasm in horses, originating from the chromaffin cells of the adrenal medulla. Characterized by the excessive production of catecholamines, this tumor can lead to severe cardiovascular disturbances, including hypertension and tachycardia, and systemic symptoms which pose significant challenges for diagnosis and management. Although in veterinary medicine pheochromocytomas are more commonly documented in small animals, their occurrence in equine patients requires a thorough understanding of their pathophysiology, clinical presentation and diagnostic strategies, to improve prognosis and clinical outcomes.
Materials and methods: A fifteen-year-old intact male Friesian horse (*Equus ferus caballus*) was referred to the veterinary center at Cluj-Napoca Faculty of Veterinary Medicine Equine Clinic for assessment following abnormal gait, ataxia, progressive weakness, myopathy, and lately lateral decubitus. Following a complete autopsy, multiple organs were harvested and routinely processed for histological examination.
Results: Grossly, a 3x4 cm dense, focally necrotic, dark-red mass was identified in the left adrenal gland associated with acute perirenal hematoma and severe haemoperitoneum. Histologically, within the adrenal gland, there was a mass composed of nests and clusters of polygonal to spindle-shaped cells, separated by a fine fibrovascular stroma. The neoplastic cells exhibited abundant granular cytoplasm. Nuclei were round to oval, with a stippled chromatin pattern and occasional prominent nucleoli. Mitotic figures were infrequent, and areas of hemorrhage and necrosis were also present within the tumor.
Conclusions: This case highlights the importance of recognizing pheochromocytoma as a differential diagnosis in horses presenting with severe systemic symptoms. The gross and histological findings are consistent with pheochromocytoma. The detailed histopathological examination confirmed the diagnosis through the identification of characteristic cellular morphology and staining properties.

Keywords: Pheochromocytoma, horse

TOXICOKINETIC OF PLASTIC PARTICLES AFTER DIGESTIVE EXPOSURE IN RODENTS: A SYSTEMATIC REVIEW

Paula-Raluca POPA[1*] and Alexandru Flaviu TĂBĂRAN[1]

[1]*Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania*
[*]Corresponding author, e-mail: raluca-paula.popa@student.usamvcluj.ro

Introduction: The high production of plastic, biostability, and poorly managed recycling have led to its widespread presence in the environment (Ritchie and Roser 2018; Ostle et al.,2019). Pollution from microplastic (particles smaller than 5mm) and nanoplastic (particles smaller than 1μm) poses a serious environmental problem with long-term negative impacts on human and animal health (Llorca et al., 2021). The goal of this systematic review is to identify the toxicity of microplastic and nanoplastic after they are ingested by rodents.
Methods: A total of 1057 articles were identified in the PubMed database, Web of Science, and Google Scholar through manual search. After removing duplicates, 560 articles remained. Upon reviewing titles and abstracts, 500 articles were excluded. Out of the remaining 60 articles, 43 were excluded, and 17 were included in the study
Results: The current clinical evidence indicates that plastics can enter the body in the form of microplastic and nanoplastic. The digestive system is a significant pathway for absorption, and the resulting changes are influenced by factors such as the type of plastic, duration of exposure, particle size, and the individual's clinical condition.
Conclusion: Once absorbed, plastic particles can enter the body and cause significant changes in intestinal barrier function, hepatic metabolic changes, oxidative stress, and nephrotoxicity.

Keywords: absorption, digestive system, plastic, rodents, toxicokinetic.

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OXIDATIVE STRESS MARKERS IN ROMANIAN SPOTTED COWS AFFECTED BY RETAINED FETAL MEMBRANES

Horaţiu RAFA[1], Oana Maria COZMA[1], Ioan OROIAN [2], Andreeea Georgiana MOROHOSCHI[1], Daria Antonia DUMITRAŞ[1] and Sanda ANDREI[1]

[1]Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania.
[2]Staţiunea de Cercetare – Dezvoltare pentru Creşterea Bovinelor, Sângeorgiu de Mureş, Romania
*Corresponding author, e-mail: sandrei@usamvcluj.ro

Introduction: Retained fetal membranes (RFM) are a significant concern in cattle, affecting reproductive performance, extending intercalving intervals, and impacting overall health.
Aims: This collaborative clinical study with a Romanian Spotted cattle farm investigated the relationship between oxidative stress markers in plasma and retained fetal membranes (RFM).
Materials and Methods: Over a 9-week period, plasma samples were collected from 22 cows, 7 with RFM and 15 with normal parturition. The samples were analysed using specific kits to measure levels of superoxide dismutase (SOD), catalase (CAT), malondialdehyde (MDA), and total antioxidant capacity (TAC).
Results: In the early pre-parturition weeks, SOD activity showed no significant differences. However, a significant increase occurred two weeks before parturition, indicating heightened oxidative stress. During labor, a significant decrease in SOD activity was observed in cows with RFM, suggesting depleted antioxidant defences. Postpartum, an initial rise in SOD activity hinted at an acute oxidative stress response, followed by potential stabilization. CAT activity fluctuated, with a notable increase two weeks before parturition in RFM cows, suggesting heightened oxidative stress. Elevated catalase activity during parturition was associated with the physiological stress of birth, particularly in RFM cases. One week postpartum, significant differences in CAT activity indicated ongoing oxidative stress in RFM cows, potentially impacting recovery and lactation. Later postpartum weeks, especially four weeks after parturition, pointed to prolonged oxidative stress. TAC showed an early compensatory increase in RFM cows four weeks before parturition, suggesting a preparatory response to impending parturition stress. The peak in TAC during parturition in RFM cows indicated heightened oxidative stress, while the postpartum period revealed complex recovery patterns. MDA levels, a marker of lipid peroxidation, increased before parturition, with significant levels three weeks' prior, suggesting that oxidative stress peaks during labor and contributes to RFM. Postpartum, MDA levels indicated a dynamic recovery process, raising concerns about ongoing oxidative challenges.
Conclusions: This clinical study provides valuable insights into the biochemical and metabolic changes associated with RFM in cattle. It highlights the importance of monitoring oxidative stress markers to understand and potentially mitigate the impacts of RFM on cattle health and productivity.

Keywords: cow, parturition, RFM, CAT, SOD, MDA, TAC

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THE IMPACT OF RETAINED FETAL MEMBRANES ON METABOLIC AND HORMONAL PROFILES IN ROMANIAN SPOTTED COWS

Horațiu RAFA[1], Oana Maria COZMA[1], Ioan OROIAN[2], Andreeea Georgiana MOROHOSCHI[1], Daria Antonia DUMITRAȘ[1], Daniela NEAGU[1] and Sanda ANDREI[1]

[1]Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania.
[2]Staţiunea de Cercetare – Dezvoltare pentru Creşterea Bovinelor, Sângeorgiu de Mureş, Romania
*Corresponding author, e-mail: sandrei@usamvcluj.ro

Introduction: Retained fetal membranes (RFM) represent a significant postpartum complication that can adversely affect the overall health, fertility, and productivity of dairy cattle.
Aims: This clinical study explores various metabolic and physiological parameters in dairy cows during the puerperium period.
Materials and Methods: Over a 9-week period, plasma samples were collected from 22 cows, 7 with RFM and 15 with normal parturition. The research focuses on changes in total proteins, albumin, glucose, triglycerides, total cholesterol, aspartate aminotransferase (AST) and alanine aminotransferase (ALT), cortisol, insulin, and insulin-like growth factor 1 (IGF-1) levels among cows experiencing a normal postpartum period (NP) and those with RFM.
Results: The study noted a significant increase in protein levels during the postpartum period in the RFM group, indicating the physiological impacts of RFM at this stage. Albumin levels showed significant differences, highlighting the biological effect of RFM in the postpartum period. Glucose levels varied significantly in the weeks leading up to parturition, suggesting altered metabolic states in cows that developed RFM. Triglyceride and cholesterol levels were significantly higher during the antepartum period in the group that experienced reproductive failure, indicating substantial alterations in lipid metabolism that could precede the onset of RFM. AST and ALT levels provided insights into cellular stress and liver function, with significant increases noted around parturition, likely due to the substantial physiological strain of labor. Cortisol levels were higher in RFM cows two weeks before parturition, which may indicate an increased stress response or physiological preparation for labor, more pronounced in cows predisposed to RFM. Insulin levels decreased significantly before and at parturition in RFM cows, suggesting a strong energy deficit. IGF-1 levels also decreased significantly in RFM cows after parturition.
Conclusions: Significant changes in metabolic parameters, including glucose, triglycerides, and cholesterol levels, highlight the pronounced metabolic challenges experienced by cows with RFM. The study reveals that although some variations occur as parturition approaches, the most significant effects of RFM on metabolic and physiological parameters are observed postpartum. These alterations may impact the health, recovery, and productivity of cows after parturition, underscoring the need for targeted management strategies to address and mitigate the effects of RFM.

Keywords: Romanian Spotted Cows, puerperium, RFM, metabolic profile, hormones

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THE USE OF INTRAVENOUS LIPID EMULSION FOR THE TREATMENT OF SMALL ANIMAL'S INTOXICATIONS

Oana ROTAR [1], Alexandra DREANCĂ[1*], Denisa SAND[1], Hélène GRAO[1], Dalma PIVARIU[1], Ioan MARCUS[1], Adrian Nechita OROS[1], Bogdan SEVASTRE[1]

[1]Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania

* Corresponding author: alexandra.dreanca@usamvcluj.ro

Introduction: Veterinary medicine often encounters cases of poisoning in domestic animals due to their environment and accidental ingestion of toxic substances. This study presents a series of clinical cases involving cats and dogs, detailing the effectiveness of lipid emulsion therapy (LET) in treating various intoxications.

Objectives: This retrospective study aimed to broaden the known spectrum of action of intravenous lipid emulsions (ILE) and to promote their use in small animal intoxications.

Materials and methods: Medical records of 25 dogs and cats admitted to the emergency department of the Cluj-Napoca faculty, receiving ILE between 2023–2024 were analyzed for suspected toxicant, clinical signs, ILE dosages, the effect and adverse effects of ILE, and patient outcome. Microsoft Excel was used for the underlying data processing.

Results and discussion: 19 dogs and 6 cats were poisoned with unidentified toxicants (16%), over-the-counter drugs (8%), insecticides (28%), tremorgenic mycotoxins (12%), metaldehyde (12%) and other toxicants (24%) (nicotine, cannabis, ibuprofen). Clinical signs included neurologic signs, mostly cortical inhibition, tremors and seizures (68%), cardiovascular signs (12%), thermoregulation (12%) or gastrointestinal abnormalities (28%). Treatment with ILE was initiated. Dogs and cats received mostly the standard ILE therapy protocol. A positive effect was observed in 84 % of canine and 66% of the feline patients after ILE administration. In addition, partial or complete remission of the most severe clinical sigs were seen at a median of 7.8 hours after ILE administration. There were no adverse effects of ILE seen throughout this study.

Conclusions: ILE treatment was successful in most patients being a successful antidote for several toxic agents. ILE are able to shorten the hospitalisation period, completely remitting the intoxication clinical signs, thus helping the economic status of the owner.

Keywords: lipid emulsions, clinical toxicology, insecticides, metaldehyde.

UNUSUAL MUSCLE-RELATED MORPHOLOGICAL FEATURES DETECTED IN THE CRANIAL CAVA VEIN IN 10-DAY-OLD BROILER CHICKENS

Vasile RUS[1], Maria-Cătălina MATEI-LAȚIU[1*], Adrian Florin GAL[1]

[1]Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania
[*]Corresponding author, e-mail: catalina.matei@usamvcluj.ro

Introduction: The birds, in contrast to mammals, have two cranial cava veins. The two cranial cava veins and caudal cava vein are the largest veins in chickens. In general, veins have a wall consisting of 3 tunics: intima, media and adventitia. In the structure of the media, in the veins, the presence of cardiac striated muscle cells has been reported in the dog, rats and birds.
Aims: This study aimed to describe the microscopically structure of the left and right cranial cava veins in 10 days old chicken broiler.
Materials and Methods: Fragments from the left and right cranial vena cava were collected during the necropsy and were histologically processed by paraffin inclusion and stained with Verhoeff-trichrome method. The study was approved by the Bioethics Committee of the USAMV-CN, no. 453 from 29.05.2024.
Results: The left and right cranial vena cava have relatively thin walls compared to the lumen. Microscopically, these veins are of the muscular type. The intima is formed by an endothelium, the media is formed by circular smooth muscle cells and the adventitia is formed by dense non-oriented connective tissue. A particular aspect, observable in both veins is the fact that smooth muscle cells with a predominantly longitudinal orientation are present in the structure of the adventitia. Both in the left cranial vena cava and in the right one, the proportion between the amounts of muscle tissue in the media relative to that in the adventitia is not identical on the entire circumference of the vessel.
Conclusion: The left and right cranial vena cava in 10 days old boiler chickens are muscular veins and media is formed by smooth muscle cells with a circular orientation. The peculiarities of the vascular wall of these veins are the presence in tunica adventitia of smooth muscle cell with longitudinal orientation. In some area of the venous wall the quantity of muscles cell presents into the tunica adventitia greater than in tunica media.

Keywords: broiler chicken, cranial cava vein, perpendicular muscle cells.

BIOLOGICAL ACTIVITIES AND ACUT TOXICITY OF COMBRETUM MICRANTHUM

Ibrahima Mamadou SALL[1], TABARAN Alexandru-Flaviu[1], Alina Diana HASAS[1], Malek AMIALI[2]

[1]*Department of Anatomic Pathology, Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Cluj-Napoca, Romania*
[2]*Department Food Technologies and Humain Nutrition at National Higher School of Agronomy (ENSA) , Algier/Algeria.*
[*]Corresponding author, e-mail: ibrahima.sall@student.usamvcluj.ro

Introduction: *Combretum micranthum* is a plant used in Africa for its many therapeutic properties [1]. It is most often used for diuretic and digestive purposes, including gastrointestinal problems, colic, and vomiting [2]. Our study was carried out to determine the phytochemical composition and biological activity, followed by an evaluation of the acute toxicity of ethanolic extracts of *Combretum micranthum* leaves on BALB/c mice.

Materials and Methods: we prepared an ethanolic extract of the dried leaves of *Combretum micranthum*, which we administered to female BALB/c mice at doses of 50mg/kg, 300mg/kg, and 2000 mg/kg for 14 days, evaluating 3 parameters (weight gain, water, and food consumption). After sacrifice, histological, hematological, and biochemical analyses were performed. The Protocol is based on the slightly modified guideline 420 of the Organisation for Economic Co-operation and Development (OECD).

Results: *Combretum micranthum* has a yield for ethanol extraction (17.34%) and also contains 155 organic compounds, including 34 flavonoids, 16 phenolic acids, 14 alkaloids, 15 fatty acids, 14 terpenoids/steroids, 24 amino acids, 6 minerals, 8 carbohydrates, and 30 other organic compounds have been identified from this plant [3]. Acute toxicity analyses showed that the Lethal Dose 50 (LD50) of this extract would be higher than 2000 mg/kg, as no case of death was recorded. In addition, we noted no non-significant differences in zootechnical parameters and organ weights and no significant differences in hematological and biochemical parameters between test and control groups.

Conclusion: Our study aimed to investigate the biological activity and assess the acute toxicity of ethanolic extracts of C. micranthum on BALB/c mice. From this study, we were able to conclude that the LD50 of Combretum micranthum extract is greater than 2000 mg/ml.

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TO BLEED OR NOT TO BLEED: A THOROUGH REVIEW ON HEMOSTATIC AGENTS

Denisa SAND[1], Alexandra DREANCA[1], Klara MAGYARI[2], Zsejke-Réka TOTH[2], Lucian BAIA[2] and Ioan MARCUS[1]

[1]Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania
[2]Nanostructured Materials and Bio-Nano-Interfacesd Center, Interdisciplinary Research Institute on Bio-Nano-Sciences, Babes-Bolyai University, 400271 Cluj-Napoca, Romania
[*]Corresponding author, e-mail: denisa.sand@usamvcluj.ro

Introduction: Hemostatic agents have become indispensable tools in contemporary bleeding management, finding applications in both surgical and emergency settings (1). This paper delves into the role of hemostatic agents, offering a concise classification potential limitations in specific scenarios.
Aims: This paper highlights the importance of continuous innovation and research in optimizing the efficacy of hemostatic agents to meet the evolving demands of medical practice.
Materials and methods: A search has been conducted via several databases (PubMed, ResearchGate, Google Scholar) and all relevant articles from 2007-2024 were extracted. Both human and animal trials have been used in this study.
Results: Hemostatic agents can be broadly categorized into three main types: mechanical, chemical, and hemostatic biomaterials. Mechanical hemostasis work by providing a physical barrier to bleeding, thereby inducing hemostasis through iatrogenic vascular spasm. Chemical hemostasis operates by facilitating coagulation through biochemical interactions, effectively triggering the clotting cascade. Hemostatic biomaterials, such as gelatin matrices, combine physical and biochemical mechanisms to control bleeding through multiple pathways, offering a versatile approach to hemostasis (2). Despite their widespread use and significant advancements, several drawbacks and limitations as inaccessible wound sites, hypersensitivity reactions, and resorbtion issues are associated with hemostatic agents.
Conclusions: The utility of hemostatic agents has expanded significantly with advances in biotechnology, enhancing their effectiveness in complex surgical procedures and trauma care. Their ability to reduce operative time, minimize blood loss, and improve patient outcomes underscores their importance in modern medicine, although limitations regarding specific procedures can be found in all types of agents.

Key words: hemostasis, hemostatic agents, biomaterials

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EFFICACY EVALUATION OF AN CANINE ANTHELMINTIC PRODUC BASED ON MILBEMYCIN OXIME AND PRAZIQUANTEL MOLECULE IN NATURAL INFECTED DOGS FROM HUNEDOARA COUNTRY

Diana TODORAN[1], Melania CRISAN[2], Octavia TAMAS-KRUMPE[2], Daria FENESAN[2] and Laurent OGNEAN[2]

[1]*Faculty of Veterinary Medicine, University of Agricultural Science and Veterinary Medicine Cluj-Napoca, Romania*
[*]Corresponding author, e-mail: melaniacrisan@gmail.com

Introduction: The veterinary medical products Milbenin 12.5 mg/125 mg chewable tablets for dogs A.U.V. and Milbenin 2.5 mg/25 mg chewable tablets for small dogs and puppies A.U.V. are recommended for the treatment of mixed infestations in dogs with adult cestodes and nematodes susceptible to praziquantel and milbemycin oxime. Its active substances are milbemycin oxime (12.5 mg/tablet, respective 2.5 mg/tablet) and praziquantel (125.0 mg/tablet, respective 25.0 mg/tablet), and the recommended dose is 0.5 mg of milbemycin oxime and 5 mg of praziquantel per kg given once orally.
Aims: The objective of this study was to evaluate the antiparasitic effect of a canine anthelmintic product on the basis of milbemicyn oxime and praziquantel in a batch of 20 dogs located in a shelter from Hunedoara county.
Materials and Methods: The study protocol included data collection, anamnesis of each individual dog together with a detailed history of internal dewormers for each dog separately.The current study is a single-unit one, so that the subjects who took part in the test received only one dose of anthelmintic product for veterinary use based on milbemycin oxime and praziquantel. Fecal samples were evaluated microscopically after the flotation as well as the macroscopic examination.
Results: The subjects were represented by dogs and puppies aged between 1-10 years, males and females, common breed, from Hunedoara county and presenting natural infestations with: Taenia spp., Trichuris vulpis, Toxocara canis.
Conclusion: It has been demonstrated that the anthelmintic treatment in combating parasitic infestation has a 95% efficacy following the collection of faecal samples before and after administration.

Keywords: milbemycin oxime, praziquantel, dogs

ESTROUS CYCLE LENGTH IN THE ALGERIAN ARBIA GOAT: EXFOLIATIVE VAGINAL CYTOLOGY AND SERUM PROGESTERONE LEVELS

Achour YAHIA[1], Nabila HAMMAMI[1], Khelaf SAIDANI[1], Khadidja HAMRAT[2], Nora MIMOUNE[1]

[1]Laboratory of Biotechnologies Related to Animal Reproduction (LBRA), Institute of Veterinary Sciences, Saad Dahleb University, BP270, Soumaa, 09000, Blida, ALGERIA
[2]Veterinary Medicine Faculty, University of Agricultural Sciences and Veterinary Medicine, Calea Mănăştur 3-5, 400372, Cluj- Napoca ROMANIA
[3]Animal Health & Production Laboratory, Higher National Veterinary School, Issad Abbes, 16059, Algiers, ALGERIA
*Corresponding author, e-mail: achourveto@yahoo.fr

Introduction: Perfect knowledge of the characteristics of the sexual cycle and its different stages is of decisive value in the success of breeding (Bello *et al.* 2023). It is well known that the female reproductive tract is a target for sex steroid hormones. The endometrium and the vaginal epithelium are especially influenced by sex hormones which determine their development and function (Ola *et al.* 2006). In Algeria, as far as the authors know, there is little or no work done on the nature of reproductive cyclicity in local goats and the characterization of sexual cycle parameters.
Aims: This study aimed to estimate the estrous cycle length of the Algerian Arbia goat in Northern Algeria.
Materials and Methods: Eighteen (18) Arbia goats were used in our work. Blood samples were taken from each goat twice a week (at a 2 or 3-day interval) for 3 months. The serum progesterone concentration was determined by Radio-Immuno-Assay. Smears of the vaginal mucosa were taken at the same time as the blood samples. The predominance of superficial cells on the smear of the vaginal mucosa as well as a serum progesterone level less than 1 ng/mL expressed the return to estrous which was considered the beginning of a new cycle.
Results: A negative correlation was observed between the percentage of superficial cells (SC) and serum progesterone (P4) levels in all goats. Our results showed a significant difference ($P<0.05$) between the means of different cycle lengths obtained among the females. In addition, normal cycles had an average of 20.11±1.85 days (17-25 days) representing 59.6% of cycles. Besides, a large number of short cycles (<17 days) with an average of 14.41±1.51 days were found representing 25.5% of recorded cycles. The number of long cycles (>25 days; with an average of 32.14±5.58 days), represented 14.9% of recorded cycles.
Conclusion: Following these results, it can be concluded that the local goat in Northern Algeria had different types of cycles (normal, short, and long) with a large percentage of normal cycles.

Keywords: Cycle length, goat, progesterone, vaginal cytology smears

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A REVIEW ON THE USE OF ANTAGONIST MEDICATION IN FENTANYL AND A2-ADRENERGIC AGONIST INTOXICATION

Diana Bianca ZALISCHI[1*] and Mihai Sorin CERNEA

[1]*Faculty of Veterinary Medicine, University of Agricultural Science and Veterinary Medicine Cluj-Napoca, Romania*
[*]Corresponding author, e-mail: diana-bianca.zalischi@usamvcluj.ro

Introduction: Fentanyl, a potent synthetic opioid, and alpha-2 adrenergic agonists like medetomidine are widely used in both human and veterinary medicine for their analgesic and sedative properties.
Aims: This study aims to provide an overview of the pharmacological properties, clinical applications, and safety profiles of fentanyl and alpha-2 agonists, particularly medetomidine. Additionally, it examines the role of their respective antagonists in both veterinary and human medicine.
Materials and Methods: A comprehensive literature review was conducted, analyzing studies on fentanyl and medetomidine, their mechanisms of action, pharmacokinetics, and pharmacodynamics. The review also included the antagonists nalbuphine, butorphanol, atipamezole, yohimbine, and naloxone, focusing on their efficacy in reversing the effects of the primary agents.
Results: Fentanyl, with its rapid onset and potent analgesic effect, is extensively used for pain management. Medetomidine, an alpha-2 agonist, provides sedation and analgesia by activating central alpha-2 adrenergic receptors, reducing sympathetic outflow. Both agents, however, are associated with significant side effects, including respiratory depression with fentanyl and bradycardia and hypotension with medetomidine. Naloxone effectively reverses opioid effects, including fentanyl overdose, while nalbuphine and butorphanol provide partial antagonism with some analgesic properties. Atipamezole and yohimbine are effective in reversing the sedative and cardiovascular effects of medetomidine, restoring normal physiological function. In veterinary medicine, these agents are used to manage pain, sedation, and anesthesia in various species, with antagonists providing a critical safety net for overdose and adverse reactions.
Conclusion: Fentanyl and medetomidine are invaluable in clinical practice for their potent analgesic and sedative effects. Their use, however, requires careful monitoring due to the potential for severe side effects. Antagonists such as naloxone, nalbuphine, butorphanol, atipamezole, and yohimbine are essential tools in mitigating these risks, ensuring patient safety, and enhancing therapeutic outcomes in both human and veterinary medicine. Further research into optimizing dosing regimens and minimizing adverse effects will continue to improve the clinical utility of these agents.
Keywords: alfa 2 agonists, atipamezole, fentanyl, naloxone, yohimbine

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SESSION 9: VETERINARY MEDICINE - CLINICAL SCIENCES

THE OSTEOINDUCTIVE POTENTIAL OF BIOPOLYMER-BASED GOLD NANOPARTICLE-CONTAINING BIOACTIVE GLASSES ON A COMPLICATION OF A TIBIAL FRACTURE IN DOG. CASE REPORT

Andreea Niculina AȘTILEAN (PERTEA)[1], Alexandra DREANCĂ[1], Nicușor Valentin OROS[1], Sorin MÂRZA[1], Klara MAGYARI[2] and Liviu OANA[1]

[1]*Faculty of Veterinary Medicine, University of Agricultural Science and Veterinary Medicine Cluj-Napoca, Romania*
[3]*Nanostructured Materials and Bio-Nano-Interfaces Center, Interdisciplinary Research Institute on Bio-Nano-Sciences, Babes-Bolyai University, Cluj-Napoca, Romania*
[*]Corresponding author, e-mail: andreea-niculina.astilean@usamvcluj.ro

Introduction: Tibial fractures represent a high percentage of all diaphyseal fractures of long bones in dogs, being in second place after femoral ones, they occur most often as a result of road accidents and falls from height. The most frequent complications that can occur are infections, migration of implants, their bending or breaking, vicious callus. Along with osteosynthesis, there are a multitude of biomaterials that are successfully used in orthopedics.
Aims: In this paper we report a classical osteosynthesis technique and application of biomaterials based on biopolymer composites-bioactive glass and gold nanoparticles (Alg-Pll-BGAuSP) in delayed bone regeneration caused by complications of the fracture site such as infection, implant bending and rupture, vicious callus.
Materials and Methods: A 3-year-old mixed breed dog presented with severe lameness and a high degree of deformity, pain in the right hindlimb after an osteosynthesis intervention performed four weeks ago, due to an open tibial fracture caused by a road accident. Radiographic findings of the tibial level confirm the bending plate and breaking intramedullary rod, osteolysis, present a vicious callus. The osteosynthesis and application of biomaterials in the fracture site was performed.
Results: The recovery after the surgical intervention was favorable, the patient supported the limb the day after surgery. At 12 weeks follow-up evaluation, the dog was free of lameness and the osteotomy site was completely healed.
Conclusion:. This paper describes the first tibial osteosynthesis technique and application of biomaterials based on biopolymer composites-bioactive glass and gold nanoparticles performed in a dog with major complications of the fracture site and delayed bone healing.

Keywords: tibial fractures, complications, biomaterials, biopolymer composites-bioactive glass and gold nanoparticles, osteosynthesis, dog

HABITAT INFLUENCE ON TRACE ELEMENT STATUS IN CATS

Emanuela BADEA[1*], Gheorghe Valentin GORAN[1], Oana Diana MIHAI[1], Carmen Daniela PETCU[1], Cristina ȚOCA[2]

[1] *Faculty of Veterinary Medicine, UASVM of Bucharest, Romania*
[2]*Institute for Diagnosis and Animal Health of Bucharest, Romania*
[*]Corresponding author, e-mail: emanuela.badea@fmvb.usamv.ro

Introduction: Trace elements play a crucial role in feline health, influencing numerous physiological processes (Sedlácková et al., 2022). Variations in habitat can significantly alter the availability and balance of these elements, with environmental factors such as water and food quality being able to affect trace element intake (Duran et al., 2010). Additionally, indoor and outdoor habitats come with different nutritional sources, leading to potential disparities in trace element levels among feline populations.
Aims: The present study aimed to assess the influence of cats' living environment on the concentration of essential and toxic trace elements by hair sample analysis, while also taking into consideration the cats' sex and age.
Materials and Methods: Hair samples were collected from clinically healthy cats (n = 20) and categorized based on habitat, sex, and age. Samples were prepared for analysis by cold wet mineralization, and trace element quantification was performed using ICP-MS. Statistical analysis of the results was done using SPSS software.
Results: Overall, trace elements had higher mean concentrations in cats living outdoors compared to cats living indoors, especially Fe, Mn, and Mo, however statistical analysis showed no significant differences for any of the analysed elements. No statistical significance was found either when evaluating the influence of sex or age of the cats on trace element levels, however older cats generally had higher trace element concentrations.
Conclusion: The present study found that neither habitat nor age or sex do not significantly influence the concentrations of any analysed trace elements, however it can be argued that cats living outdoors and older cats generally had higher levels of most trace elements possibly because of a higher exposure to environmental pollution and a longer period of exposure to these elements.

Keywords: cats, habitat, hair, ICP-MS, trace elements.

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EPIDEMIOLOGY AND EVOLUTION OF FELINE BACTERIAL CYSTITIS: A RETROSPECTIVE STUDY

Anca BARBOS[1], Alexandra BIRIS[1], Mircea MIRCEAN[1] and Radu LACATUS[1]*

[1]*Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania*
*Corresponding author, e-mail: anca-dana.barbos@student.usamvcluj.ro

Introduction: Feline bacterial cystitis is a significant yet often underdiagnosed condition in veterinary medicine. It remains poorly understood, highlighting the need for further research in this area.
Aims: The study aimed to determine the prevalence of feline bacterial cystitis among lower urinary tract diseases, investigate epidemiological factors influencing the condition, and track the progress of bacterial cystitis in feline patients. This included assessing the effectiveness of specific treatments, healing durations, post-healing care frequency, dietary changes, hygiene practices, and environmental factors impacting feline health.
Materials and Methods: The research involved a retrospective analysis of 221 feline cases presented at the Discipline of Pathology and Clinical Medicine between January 2021 and May 2024. Owners of the cats involved were contacted post-diagnosis to gather information on treatment outcomes, dietary adjustments, water consumption, and environmental influences contributing to the recurrence of bacterial cystitis.
Results: Among the cases studied, 20 were diagnosed with bacterial cystitis, with Escherichia coli identified as the predominant pathogen. Recurrence of cystitis occurred in 25% of cases despite appropriate treatment, often linked to dietary and environmental factors. However, 75% of cases did not experience a recurrence, with consistent therapeutic, dietary, and environmental measures. Most of the cats (45%) lived indoors, while 30% had a mixed indoor-outdoor living arrangement, and 25% were exclusively outdoor cats.
Conclusion: The study suggests that specific antibiotic therapy, coupled with promoting water intake, enhancing environmental hygiene, and reducing stressors for felines, can reduce the likelihood of bacterial cystitis recurrence. These findings emphasize the importance of comprehensive care and environmental management in preventing feline bacterial cystitis.

Keywords: diet, environment, feline bacterial cystitis, hygiene

PREVALENCE, RISK FACTORS, AND CLINICAL FEATURES OF THE MOST COMMON ENDOCRINE DISEASES IN DOGS – A LITERATURE REWIEW

Cristina BERINDEAN[1], Andrei Răzvan CODEA[1*], Alina HASAS[1] and Radu LĂCĂTUŞ[1]

[1]*Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania*
[*]Corresponding author, e-mail: razvan.codea@usamvcluj.ro

Introduction: Endocrine disorders significantly impact the health and longevity of dogs, with conditions like hypothyroidism, hyperadrenocorticism (Cushing's syndrome), and diabetes mellitus among the most frequently diagnosed. These diseases pose substantial challenges due to their diverse clinical presentations, complex pathophysiology, and need for long-term management. Understanding their epidemiology is essential for improving diagnostic and therapeutic strategies in veterinary practice.
Aims: This review aims to consolidate current knowledge on the prevalence, risk factors, and clinical characteristics of the most common endocrine disorders in dogs, focusing on enhancing diagnostic accuracy and refining management practices to improve canine health outcomes.
Materials and Methods: A comprehensive search of scientific databases, including PubMed and Web of Science, was conducted to identify studies providing epidemiological data on hypothyroidism, hyperadrenocorticism, and diabetes mellitus in dogs. The selection criteria included studies that reported on prevalence, breed predisposition, risk factors, and clinical manifestations. Data were systematically extracted and analyzed to synthesize a detailed overview of these conditions.
Results: Hypothyroidism is the most prevalent endocrine disease in dogs, particularly in middle-aged to older animals, with a prevalence between 0.2% and 0.8%. Certain breeds, such as Golden Retrievers and Doberman Pinschers, exhibit a higher risk. Hyperadrenocorticism, primarily pituitary-dependent, affects about 0.1% to 1% of dogs, predominantly in small to medium-sized breeds like Poodles and Dachshunds. Diabetes mellitus, with a prevalence of approximately 0.32%, is more common in older, female dogs, especially in breeds like Miniature Schnauzers and Poodles.
Conclusions: The findings emphasize the importance of early detection and tailored management of endocrine diseases in dogs to mitigate their impact on health and longevity. Increased awareness of breed-specific risks and advancements in diagnostic methods are crucial for timely intervention and improved prognosis. Continued research is needed to further elucidate the genetic and environmental factors influencing these conditions.

Keywords: Canine hypothyroidism, Cushing's syndrome, diabetes mellitus, dog endocrine disorders, veterinary.

PREVALENCE, RISK FACTORS, AND CLINICAL FEATURES OF THE MOST COMMON ENDOCRINE DISEASES IN CATS – A LITERATURE REWIEW

Cristina BERINDEAN[1], Andrei Răzvan CODEA[1*], Alina HASAS[1] and Radu LĂCĂTUŞ[1]

[1]*Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania*
[*]Corresponding author, e-mail: razvan.codea@usamvcluj.ro

Introduction: Endocrine diseases, such as hyperthyroidism, diabetes mellitus, and hyperadrenocorticism, are significant contributors to feline morbidity, particularly in middle-aged to older cats. These conditions, characterized by hormonal imbalances, present unique challenges in veterinary practice due to their complex pathophysiology, varying clinical manifestations, and the need for long-term management. Understanding the epidemiology of these diseases is crucial for developing effective diagnostic and treatment protocols.
Aims: This review aims to synthesize current research on the prevalence, risk factors, and clinical features of the most common endocrine diseases in cats. The goal is to enhance diagnostic accuracy and optimize management strategies to improve outcomes for affected feline populations.
Materials and Methods: A comprehensive literature review was conducted using databases such as PubMed and Web of Science. Studies were included if they provided epidemiological data on hyperthyroidism, diabetes mellitus, or hyperadrenocorticism in cats. Data extraction focused on disease prevalence, associated risk factors (such as age, sex, breed, and environmental influences), clinical presentations, and outcomes.
Results: Hyperthyroidism was found to be the most prevalent endocrine disorder in older cats, with a prevalence ranging from 6% to 10% among cats over ten years old. Diabetes mellitus affects approximately 0.5% to 1% of the feline population, with higher incidence in males and neutered cats, often linked to obesity. Hyperadrenocorticism, although rare (<0.1% prevalence), presents significant diagnostic challenges due to its subtle clinical signs and the need for specialized diagnostic tests.
Conclusion: The review highlights the need for early recognition and comprehensive management of feline endocrine disorders to mitigate long-term health impacts. Enhanced awareness of risk factors and improved diagnostic techniques can aid in the timely identification and treatment of these conditions. Further research is necessary to refine understanding and management practices across diverse feline populations.

Keywords: Feline hyperthyroidism, diabetes mellitus, hyperadrenocorticism, endocrine disorders.

HERD HEALTH CONTROL AND ECONOMIC PARAMETERS OF SHEEP

Jovan BOJKOVSKI[1]*, Ivan PAVLOVIĆ[2], Milan NINKOVIĆ[2], Zsolt BECKEI[1], Ivan DOBROSAVLJEVIĆ[3], Jasna STEVNOVIĆ[4], Renata RELIĆ[5], Sveta ARSIĆ[1], Sreten NEDIĆ[1], Ivan VUJANAC[1], Aleksandra MITROVIĆ[1], Radiša PRODANOVIĆ[1] and Branko ANGELOVSKI[6]

[1] Faculty of Veterinary Medicine,,University of Belgrade, Belgrade,, Serbia
[2]Scientific veterinary Instituite Serbia, Belgrade, Serbia
[3]Specialistic veterinary institute, Požarevac, Serbia
[4]Chamber of Comerce and industry of Serbia, Belgrade, Serbia
[5] Faculty of Agricultural Sciences ,University of Belgrade, Serbia
[6]Ss. Cyril and Methodius University, Faculty of Veterinary Medicine, Skopje, North Macedonia
*Corresponding author, e-mail: jovan_bojkovski@yahoo.com

Introduction: Serbia has a long tradition of sheep breeding. Sheep are mostly kept on extensive pastures, which are not suitable for other types of agricultural production. In addition to the production of meat, milk, and wool, sheep also provide other indirect benefits. The use of pastures, other land areas that other animals are not able to use, is widely known. Grasslands and arable fields must meet the sheep's needs for bulk nutrients (pasture, hay, straw) and concentrated (barley, oats, corn, and in the critical period, up to 10% soybean meal or toasted soybeans). Manure is indispensable in the maintenance of arable land and meadows.
Aims: of this article is to give retrospecitve of breeding disease of sheep in extenisve and intenisive breeding.
Materials and Methods: clinical observation of sheep, samples took and send to futher laboratory analises(coprologicaL, bactgerilologicl, hematology and biochemical analises).
Results: In such an environment, the health of sheep can be threatened by parasitic, bacterial or viral infections. Metabolic diseases are also present, as well as inadequate zoohygiene conditions, i.e. the way they are kept. Parasitic infections are dominant in extensive farming. Respiratory diseases have a seasonal character. Diseases of the digestive organs can be present throughout the year and depend on a number of etiological factors. In Serbia, sheep were selected according to the breeding system.. Pramenka (Sjenica, Svrljiska) and various hybrids are represented in central Serbia. Winterber and Ille de France from noble breeds. In Vojvodina, crossbreeds of Cigaja and Winterberg are represented. Winterberg and Ille de France from noble breeds are also represented. Dairy sheep farming is not represented in Serbia. The milk yield of sheep ranges from 50 to 90 L. These parameters indicate that sheep farming is based on meat production lines.
Conclusion: Today, sheep farming is insufficiently competitive. The reason for this is the direct sale of live animals and meat to known users. However, insufficiently developed export activities represent a direct obstacle in the placement of live sheep**.**

Keywords: sheep, diseases, health, economic parameters

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FEATHER PICKING DISEASE IN PARROTS: A PREVALENT YET POORLY UNDERSTOOD BEHAVIOR IN AVIAN VETERINARY PRACTICE

Mariana-Gabriela BUMBU[1]*, Anca-Alexandra DOBOSI[1]

[1]*Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania*
[*]Corresponding author, e-mail: mariana-gabriela.bumbu@usamvcluj.ro

Introduction: Feather damaging behavior (FDB), also known as feather plucking, is a common behavioral disorder in captive parrots. FDB involves genetic, socio-environmental, and neurobiological factors that may stem from grooming behaviors, or stress-induced displacement grooming. Addressing feather loss requires a comprehensive approach, including thorough anamnesis and behavioral assessments. Environmental factors or medical causes must be ruled out before investigating psychogenic triggers. Approximately 10% of captive parrots engage in feather plucking behavior, a condition characterized by the repetitive and self-directed removal of feathers without underlying medical causes. This is often linked to management factors such as poor diet, social isolation, and insufficient environmental stimulation. Psychogenic feather plucking resembles exaggerated preening, potentially leading to serious medical issues including skin damage, hypothermia, infection, and in most cases bleeding. As such, it serves as both a physical welfare concern and an indicator of potential psychological distress among affected parrots. Several studies indicate that enhancing the environment through suitable foraging materials and increasing physical complexity, can effectively alter the onset and expression of feather plucking behavior in parrots. Potential mechanisms underlying these effects are also explored.
Aims: To highlight FDB as a common issue in captive parrots, influenced by genetic, socio-environmental, and neurobiological factors. Strategies such as environmental enrichment have shown promise in modifying feather plucking behavior, with ongoing research exploring underlying mechanisms.
Conclusion: Like other species, the condition of a bird's feathers reflects its overall health and nutritional status. It's important to distinguish between generalized poor feather quality and damage caused by over preening. However, this can be challenging because both conditions may occur together. Birds may pluck feathers due to underlying conditions such as skin diseases, or a feather plucking behavior may be secondary to other health conditions. Furthermore, feathers can appear unhealthy due to overall poor health or inadequate nutrition.

Keywords: Psychogenic feather plucking, nutritional status, neurobiological factors, environmental enrichment

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EVALUATION OF A NOVEL CERVICAL VERTEBRAL FIXATION TECHNIQUE IN EQUINES BASED ON THE STABILIZATION OF THE FACET JOINTS

Valeria CIULU-ANGELESCU[1], Oana Liviu-Ioan OANA[1], Mirela-Alexandra TRIPON[1]* and Cristian Mihăiță CRECAN[1]

[1]*Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania*
[*]Corresponding author, e-mail: mirela.tripon@usamvcluj.ro

Introduction: The equine cervical spine is prone to injuries, necessitating effective vertebral fixation techniques for optimal stability and rehabilitation (Nout, 2003). Current methods often face challenges in providing sufficient stability while minimising invasiveness (Walmsley, 2005). This study introduces a novel cervical vertebral fixation technique that stabilises facet joints (Crecan, 2022).
Aims: Our research aims to address these limitations by proposing an innovative approach centred on facet joint stabilisation. This technique aims primarily to improve the stability of the cervical spine and reduce spinal cord compression, with the goal of significantly alleviating clinical symptoms and enhancing the quality of life for affected horses.
Materials and Methods: Our methodology includes developing and implementing a novel technique specifically designed to stabilise facet joints. A young Romanian sport horse meeting predefined criteria was subjected to the experimental procedure, and data was meticulously collected.
Results: Results demonstrate the effectiveness of the proposed technique in providing enhanced stability while minimising the complications associated with traditional methods. The discussion interprets the results in the context of current equine veterinary practices, highlighting the potential clinical implications and benefits for equine health.
Conclusion: In conclusion, our research presents a promising advancement in cervical vertebral fixation for equines, offering a new avenue for improved stability and reduced complications—the findings open avenues for further research and application in equine veterinary medicine.

Keywords: equine, cervical spine, vertebral fixation, facet joint, stabilisation

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DIAGNOSTIC UTILITY OF METHYLENE BLUE UPPER DIGESTIVE CHROMOENDOSCOPY IN DOGS

Andrei Răzvan CODEA[1], Andrei Paul COZMA[1]*, Alexandra BIRIŞ[1], Cristian POPOVICI[1], Daniela NEAGU[1] and Mircea MIRCEAN[1]

[1] *Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania*
*Corresponding author, e-mail: andrei-paul.cozma@usamvcluj.ro

Introduction: Upper digestive chromoendoscopy enhances the visualization of gastrointestinal mucosal lesions using special dyes like methylene blue, which highlights areas of inflammation and structural abnormalities for clearer tissue views.
Aims: The aim of this study was to evaluate the diagnostic utility of methylene blue upper digestive chromoendoscopy in dogs with oesophageal and gastric lesions.
Materials and Methods: Eight client-owned dogs of various breeds with gastrointestinal symptoms were studied. Inclusion criteria involved clinical history, owner-reported symptoms, and exclusion of systemic diseases. Procedures were conducted using Karl Storz and Pentax videoendoscopes, and biopsy forceps and transendocopic lavage cannulas. Dogs were fasted for 12 hours and had fluid restriction for 3 hours before the procedure. All procedures were performed under general inhalation anaesthesia with endotracheal intubation. Gastric lavage cleared the mucosal surface, and patients were positioned in left lateral recumbency. A 5% methylene blue solution was applied, aided by N-acetylcysteine mucosal lavage as a mucolytic agent.
Results: Three types of lesions were identified: follicular gastritis, foreign bodies traumatic lesions, and reflux esophagitis. Follicular gastritis was noted in two dogs, with methylene blue highlighting nodular formations. Traumatic lesions from foreign bodies were observed in two dogs, with clear delineation post-staining. Reflux esophagitis was diagnosed in the remaining four dogs, with methylene blue accentuating hyperemic bands and delineating affected areas. Chromoendoscopy significantly enhanced lesion visualization and delineation compared to standard endoscopy. Methylene blue staining effectively highlighted inflammation and mucosal architectural disruption.
Conclusion: Methylene blue chromoendoscopy is a valuable diagnostic tool for identifying and assessing superficial lesions in the gastric and oesophageal mucosa of dogs. While conventional endoscopy is useful for surface-level visualization, chromoendoscopy enhances diagnostic precision by revealing subtler mucosal changes. Despite its limited use in veterinary medicine, this technique offers a cost-effective and efficient method for improving the diagnosis of gastrointestinal conditions in canine patients.

Keywords: methylene blue, chromoendoscopy, canine, gastric lesions, oesophageal lesions.

UTILITY OF URINARY N-ACETYL-B-D-GLUCOSAMINIDASE INDEX IN EARLY DETECTION OF ACUTE KIDNEY INJURY AMONG ROMANIAN BUFFALOES WITH PYELONEPHRITIS

Andrei Răzvan CODEA[1], Alexandra BIRIŞ[1], Cristian POPOVICI[1]*, Daniela NEAGU[1], Alexandra MUREŞAN[1], Hari Attila István[1] and Mircea MIRCEAN[1]

[1]*Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania*
*Corresponding author, e-mail: alexandra.biris@usamvcluj.ro

Introduction: Buffaloes (Bubalus bubalis) are integral to Romania's rural agriculture, valued for milk, meat, and draft power. However, their health is compromised by renal diseases, particularly pyelonephritis—a bacterial infection often caused by Escherichia coli, leading to acute kidney injury (AKI). Early detection of AKI is crucial to prevent progression to chronic kidney disease (CKD) or death.
Aims: This study evaluates the role of urinary N-acetyl-β-D-glucosaminidase (NAG), a lysosomal enzyme released during renal tubular damage, as a biomarker for early kidney injury in Romanian buffaloes with pyelonephritis.
Materials and Methods: A total of 16 Romanian buffaloes were divided into two groups: six with clinically diagnosed pyelonephritis and ten healthy controls. Clinical examinations, blood biochemical analysis, and urinary NAG measurements were conducted. The primary focus was on NAG levels, quantified using a colorimetric enzymatic assay, and expressed as a ratio to urinary creatinine (NAG/Cr) to account for urine concentration variations.
Results: Buffaloes with pyelonephritis had significantly elevated urinary NAG levels compared to controls, confirming renal tubular damage. A strong positive correlation was observed between urinary NAG levels and serum creatinine ($r = 0.82$, $p < 0.01$). These findings suggest that urinary NAG is a sensitive biomarker for early AKI detection, often preceding clinical signs and traditional markers like creatinine and urea.
Conclusion: The study underscores the utility of urinary NAG in veterinary nephrology, particularly for early AKI diagnosis in buffaloes. Early intervention based on urinary NAG levels can improve treatment outcomes, reducing the economic impact of kidney disease in agriculture. Further research is needed to establish NAG generalizability across different breeds and species, and to explore its potential in combination with other biomarkers.

Keywords: Buffalo, pyelonephritis, N-Acetyl-β-D-Glucosaminidase, acute kidney injury, renal biomarkers.

PRELIMINARY RESULTS REGARDING HOLTER MONITORING FINDINGS IN HEALTHY CATS

Alexandra COFARU[1*], Raluca MURARIU[1] , Iuliu Călin SCURTU[1]

[1]*Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine ClujNapoca, Romania*
*Corresponding author, e-mail: alexandra.cofaru@usamvcluj.ro

Introduction: Holter monitoring represents continuous ambulatory ECG for 24-48 hours. Certain rhythm disturbances can be observed in healthy cats, with a higher prevalence in older individuals. Aims: Even though Holter monitoring findings were described before in healthy cats and in cats with different types of cardiomyopathies, the number of studies is limited and a knowledge gap on the subject still exists.
The aim of this study is to offer a better understanding of the incidence and characterisation of arrythmias in healthy cats, free of any form of cardiomyopathy, using Holter monitoring.
Materials and Methods: A group of 20 healthy cats received a complete clinical examination. In-clinic 6-lead ECG and a complete echocardiographic exam were conducted, obtaining right and left parasternal classical views. Color and spectral Doppler interrogation were used according to the best practice echocardiographic examination. A Holter device was installed for 24 hours, using 4 electrodes with 3 leads. Cats returned to their home environment and withheld their normal daily activity.
Results: 16/20 cats exhibited between 1-29 ventricular ectopic beats. 11/20 cats exhibited between 1-26 supraventricular ectopic beats. In some cases, complex arrythmias have been observed, such as bigeminy, couplets, runs, or episodes of accelerated idioventricular rhythm.
Conclusion: Supraventricular and ventricular arrythmias are present in both groups. Some cats showed complex arrythmias.

Keywords: arrhythmias, electrocardiography, healthy cats, Holter monitoring

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ASSESSMENT OF HYGIENIC QUALITY AND STAPHYLOCOCCUS SPP. PREVALENCE IN SMALL RUMINANT MILK

Sergiu CONDOR[1]*, Nicolas PILON[1] , Raluca CÎMPEAN[1], Oana REGET[1], Sorin Daniel DAN[1], Marian MIHAIU[1], Laura CONDOR[1] and Alexandra TABARAN[1]

[1]*Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania*
*Corresponding author, e-mail: sergiu.condor@student.usamvcluj.ro

Introduction: Milk from small ruminants, such as goats and sheep, is valued for its unique nutritional properties and is a significant component of the dairy industry. Ensuring its hygienic quality is critical, particularly through monitoring somatic cell counts (SCC) and bacterial contamination. Somatic cells, including leukocytes and epithelial cells, serve as indicators of udder health and milk quality. Staphylococcus spp., a common pathogen in milk, can compromise both safety and quality. Effective monitoring of SCC and bacterial presence is essential for maintaining high hygienic standards and ensuring consumer safety (Leitner, 2016).
Aims: This study aims to comprehensively analyze somatic cells present in the milk of small ruminants. Specifically, it seeks to determine the number of somatic cells to establish a baseline for cell counts and assess their variability. Furthermore, the research aims to evaluate the hygienic quality of the milk by quantifying bacterial contamination levels, focusing particularly on Staphylococcus spp. Additionally, the study plans to conduct a lactocytogram to examine the cellular composition of the milk, identifying different cell types and their proportions. Lastly, PCR techniques will be utilized to detect and quantify Staphylococcus spp. in milk samples, aiming to highlight potential hygiene issues and contamination risks associated with these pathogens.
Materials and Methods: Samples of sheep and goat milk, Fossomatic device, microscope, fixative solution, eosinophilic and basic stains for Panoptic staining,ISOLATE II Genomic DNA kit.
Results: Somatic cell counts in goat and sheep milk samples exhibited notable individual variations. Our investigation aimed to discern whether these fluctuations signaled mastitis or were attributable to physiological differences specific to each animal. Graphical representation indicated thresholds of $1200x10^3$ cells/ml for goats and $1500x10^3$ cells/ml for sheep, as per literature standards. Cytomorphological examination underscored several samples with heightened cellular content, including neutrophils, bacteria, and one instance of yeast presence. Notably, PCR testing revealed an 85% prevalence of Staphylococcus spp.
Conclusion: Our study revealed significant variability in somatic cell counts in small ruminant milk samples, which did not consistently correlate with sensory characteristics. Despite efforts, establishing a maximum threshold for somatic cell counts proved challenging due to the diversity observed and the presence of epithelial cells. Lactocytogram analyses indicated a higher cellular content in small ruminant milk compared to cow's milk, though not necessarily indicative of inflammation. Mastitis detection based on somatic cell counts alone was inconclusive. DNA extraction successfully identified Staphylococcus spp. in positive samples, highlighting potential hygiene concerns and contamination risks in milk production.

Keywords: Milk, PCR, Small ruminants, *Staphylococcus spp*.

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BRACHYCEPHALIC DENTAL ISSUES

Ana-Maria COSTIN[1*], Petru Cosmin PEȘTEAN[1], Florin BETEG[1]

[1]*Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania*
[*]Corresponding author, e-mail: maria.costin@usamvcluj.ro

Introduction: This paper represents a literature review on the main dental pathologies encountered in brachycephalic dog breeds. Brachycephaly is characterized by a cranial deformity where the ratio of length to width is smaller than normal, and the skull shows a flattening at the level of the occipital bone.
Aims: The aim of this study is to highlight the primary dental conditions and anomalies arising as a consequence of brachycephaly.
Results: The predisposition to these dental issues is closely correlated with the specific cranial morphology of these breeds, characterized by excessive shortening of cranial bones, resulting in disproportionate facial bones tending dorsally relative to the rest of the skull. This leads to reduced dental alveoli, dental irregularities, lack of interdental space, tooth rotation, and displacement. The dental formula of brachycephalic dogs is similar to that of other breeds, but total or partial tooth eruption can create the impression of an incomplete dental arcade.

Conclusion: Brachycephalic dog breeds exhibit a heightened risk for numerous dental conditions, which negatively impact their health.

Keywords: brachycephaly, dental pathology, health

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COMPARISON OF JUGULAR AND SAPHENOUS BLOOD LACTATE CONCENTRATIONS AS A PROGNOSTIC MARKER IN DOGS WITH GASTRIC DILATATION AND VOLVULUS

Adria HERLE[1]*, Stefan SERBAN[1] and Florin BETEG[1]

[1]*Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania*
[*]Corresponding author, e-mail: adria-larisa.herle@student.usamvcluj.ro

Introduction: Gastric dilatation and volvulus (GDV) is a life-threatening condition that causes tissue hypoperfusion in the stomach. GDV is a common pathology in large-breed dogs, characterized by rapid accumulation of air in the stomach with an increase in intragastric pressure, followed by malposition of the organ, compression on the diaphragm muscle and the caudal vena cava causing breathing difficulties and impaired cardiovascular function. In dogs with GDV, lactate is a biomarker of hypoperfusion that correlates with therapy outcomes.
Aims: The aim of this study was to evaluate the comparative lactate value of a peripheral vessel located in the caudal region of the body (saphenous vein) and a central vessel in the cranial region (jugular vein) to see if there are any major differences and if the saphenous vein is a viable alternative to measure serum lactate in case of GDV. The study also aims to provide a relevant prognosis, as close as possible to reality for the owner.
Materials and Methods: Blood was collected from the jugular vein and saphenous vein of 13 dogs diagnosed with GDV in order to measure serum lactate by rapid blood gas technique (Stat Profile Prime Plus by Nova Biomedical). The values obtained from the two blood vessels were then compared to observe the difference between them. Based on the lactate values obtained from both sites of choice a vital prognosis was given.
Results: The difference in lactate value between the jugular vein and saphenous vein averaged 0.26 mmol/L. No statistical differences were found between lactate concentrations in the two blood vessels (*P=0.48*). There were 6 subjects who survived even at lactate values above 6 mmol/L.
Conclusion: The differences in serum lactate values in the two blood vessels are insignificant, therefore the saphenous vein remains a viable alternative for measuring lactate in dogs with GDV. A favorable vital prognosis can be given even at lactate values above 6 mmol/L.

Keywords: gastric dilatation and volvulus, lactate, prognosis

IDENTIFICATION OF SOME PREDICTIVE BIOMARKERS IN UTERINE BITCHES DISEASES

Ioan Emilian HORVAT[1], Florin BETEG[1], Nicodim FIȚ[1], Mihai CENARIU[1]

[1]*Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania*
[*]Corresponding author, e-mail: emyl18_1984@yahoo.com

Introduction: Procalcitonin (PCT), total white blood cell count (WBC) and C-reactive protein (CRP) are important biomarkers in the diagnosis and monitoring of various infections and inflammatory conditions, including other uterine conditions in dogs.
Aim: This study aimed to investigate the prognostic value of PCT, WBC and serial CRP measurements in dogs with sepsis and to determine their association parameters, severity of sepsis and presence of organ dysfunction.
Matherials and methods: The bitches taken in the study were consulted, examined and treated preoperatively, intraoperatively and postoperatively . Citrated blood and plasma obtained from 23 bitches with clinical signs of CEH and pyometra were used to measure total WBC, CRP, and PCT.
Results C-reactive protein was changed above the upper limits in two cases of pyometra and in four of the cases with pyometra and CEH. Two cases were equivocal, the remaining 12 cases were with normal values. Procalcitonin did not undergo changes in any of the cases presented in this study. The total number of WBC was increased above the upper limit values in 4 cases, 4 in individuals with both conditions and with normal values in 12 of the total cases taken in the study. The average age at the onset of these two conditions is 7.6 years. The median for the total number of WBC is 20.88, for C-reactive protein it is 36.30.
Conclusion: In dogs,PCT,WBC, and CRP may be useful biomarkers for the diagnosis and monitoring of pyometra and (CEH), two common uterine problems in females.

Keywords:bitch, CRP, PCT, uterine disease, WBC

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CRYPTOSPORIDIUM SPP. IN REPTILES: UNRAVELING DETECTION CHALLENGES AND MOLECULAR CHARACTERIZATION SIGNIFICANCE

Mariana LOURO[1,2*], Laura HERNANDEZ[3], João ANTUNES[1,2], Luís MADEIRA DE CARVALHO[1,2], Isabel PEREIRA DA FONSECA[1,2] and Jacinto GOMES[1,2,3]

[1]CIISA – Centre for Interdisciplinary Research in Animal Health, Faculty of Veterinary Medicine, University of Lisbon, Avenida da Universidade Técnica, 1300-477, Lisbon, Portugal
[2]Associate Laboratory for Animal and Veterinary Sciences (AL4AnimalS), Portugal
[3] Elvas School of Biosciences, Polytechnic Institute of Portalegre, Portalegre, Portugal
[*]Corresponding author, e-mail: marianacl@fmv.ulisboa.pt

Introduction: *Cryptosporidium* spp. is a parasitic infection in reptiles, hard to diagnose and treat, posing risks when exposing new animals. Diagnosis often requires specialized tests such as PCR, immunological tests and fecal analysis. Despite challenges, accurate diagnosis is crucial for effective management in reptile veterinary practice.

Aims:
1. Assess the efficacy of different diagnostic methods;
2. Determine genetic diversity of *Cryptosporidium* species in reptiles.

Materials and Methods: 43 fecal samples from 14 reptile species were collected. Samples were filtered, and centrifuged and the sediment was used for DNA extraction and detection of *Cryptosporidium* spp. oocysts using modified Ziehl-Neelsen stain (MZN) and direct immunofluorescence assay antibody (DFA). The presence of *Cryptosporidium* spp. was also tested by a nested PCR amplification of an 840 bp fragment of the small subunit rRNA gene. Positive samples were sequenced to identify *Cryptosporidium* species.

Results: 18 samples (41.9%) were positive for *Cryptosporidium* spp. Detection rates were 39.5% (PCR: n=17/43), 25.6% (MZN: n=11/43), and 14% (DFA: n=6/43). Six *Cryptosporidium* species were identified by sequencing: *C. ducismarci* (n=4) and *C. muris* (n=2) were detected by MZN and DFA, *C. testudinis* (n=2) and *C. serpentis* (n=6) by MZN. *C. tyzzeri* (n=2) and *C. ditrichi* (n=1) were not detected by MZN or DFA.

Conclusion: DFA was not effective for diagnosing *Cryptosporidium* spp. in reptiles. MZN was better but less effective than PCR. The presence of rodent-associated *Cryptosporidium* species in reptiles suggests ingestion of contaminated prey or food and water.

Keywords: *Cryptosporidium* spp., immunofluorescence assay, Ziehl-Neelsen, PCR, reptiles

IN VITRO EFFICACY OF ALBENDAZOLE AND DORAMECTINE ON SHEEP GASTROINTESTINAL STRONGYLES

Virginia Ana MAGDAȘ[1], Cristian MAGDAȘ[1], Mihai Sorin CERNEA[1], Vasile COZMA[1]

[1]*Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania*
[*]Corresponding author, e-mail: cmagdas@usamvcluj.ro

Introduction: Gastrointestinal nematodes are widespread in grazing sheep causing significant economic losses. The resistance of parasites to pharmaceutical products available on the market represents a current problem. In vitro methods for determining resistance are fast and can be used for multiple classes of anthelmintics, but they require a large amount of work and do not detect low levels of resistance (Martin, 1997; Hinney et al., 2020).
Aims: The aim of this study was to test the effectiveness of albendazole (ABZ) and doramectine (DOR) on sheep digestive nematodes.
Materials and Methods: The study was carried out in 2 herds from Cluj County, Roumania, during 2022. Individual samples were collected from 10 randomly selected animals in each flock. The eggs were subsequently recovered using the sieving techniques. Two tests were conducted for albendazole (the egg hatching test and the larval development test) and one for doramectin (larval development test). Five concentrations were prepared for both molecules, with each concentration tested in five replicates.
Results: The larval hatching test revealed an efficacy for albendazole of 43.2% for the first flock and 60.8% for the second one. According to the results of the larval development test, the strongyle populations infesting the sheep in the first flock showed resistance for both tested molecules (albendazole: 43,2% and doramectine: 71,8%), while in the second flock, resistance was observed only to albendazole (61,6%), the macrocyclic lactone showing 100% efficacy.
Conclusion: According to the tests conducted, the gastrointestinal strongyles present in both flocks exhibit resistance to albendazole. In contrast, doramectin resistance was observed only in the first flock.

Keywords: albendazole, digestive strongyles, doramectine, in vitro tests, sheep

CANINE ATOPIC-LIKE DERMATITIS: A CLINICAL CASE

Lorena-Eliza MASTAN[1], Adriana GYÖRKE[1*] and Aurora-Livia URSACHE[1]

[1] *Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania*
[*]Corresponding author, e-mail: adriana.gyorke@usamvcluj.ro

Introduction: Canine Atopic-Like Dermatitis is a term currently used to describe a generally pruritic, inflammatory skin disease that cannot be clinically distinguished from canine Atopic Dermatitis, while showing no identifiable IgE response to environmental allergens (Miller et al., 2012). In some patients clinically diagnosed with canine Atopic Dermatitis, intradermal and serum environmental allergen tests conclude negative, in which case, the diagnosis shifts to canine Atopic-Like dermatitis. The reason of negative serological and intradermal test results in patients with canine Atopic Dermatitis is currently not well-established, but possible causes include allergic involvement of minor allergens not included in the intradermal allergy tests, respectively shifted immune dysregulation pathways that do not involve either IgE production or antigen-binding function (Hensel et al., 2024).
Aims: This case report aims to present the clinically relevant and complex entity of canine Atopic-Like Dermatitis, providing specific information on clinical and paraclinical features and evolution, diagnosis and therapeutical approach in a canine Atopic-Like Dermatitis case.
Materials and Methods: An 18-month old mixed breed dog with no prior medical history available was first presented in 2022 to the Veterinary Dermatology Clinic of USAMV Cluj-Napoca, showing intense pruritus, no skin lesions and general distress. This report documents the patient's clinical timeline between 2022 and 2024, using medical letters, test results and original photographs as a means of tracking the evolution of the case.
Results: Reviewing the initial dermatological examination and follow-ups between 2022 and 2024, including negative serological and intradermal allergy tests, concluded in a detailed showcase of a canine Atopic-Like Dermatitis case.
Conclusion: This case offers insight into the complex phenomena of canine Atopic Dermatitis and canine Atopic-Like Dermatitis, providing information about how these clinically similar entities present and respond to therapy in certain individuals.

Keywords: Atopic-Like Dermatitis, Canine Atopic Dermatitis, allergen-specific immunotherapy.

PREVALENCE OF CARDIAC DISEASES IN DOGS AND CATS: RETROSPECTIVE STUDY (2022 - 2024)

George Cristian MAURER*, Romain Pierre-Yves HUREL, Laura Cristina STEFĂNUȚ

[1] *Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania*
*Corresponding author, e-mail: george-cristian.maurer@usamvcluj.ro

Introduction: Veterinary cardiology is a constantly evolving speciality. Technological advances over the years, in particular the introduction of new ultrasound techniques, have made it possible to diagnose certain heart diseases earlier. It is now essential to know the prevalence of heart disease in companion animals in order to provide quality care and appropriate management. Recent studies have shown that heart disease is common in dogs and cats, with prevalence rates varying according to age, sex and breed. Among cardiac pathologies, cardiomyopathies are described as the most common in cats, whereas valvular diseases are the most common in dogs.
Aims: This study aims to expand knowledge on this subject by examining retrospective epidemiological data on frequent cardiac pathologies in small animals in Romania from the database of the Cluj-Napoca Veterinary Faculty.
Materials and Methods: This retrospective analysis was carried out at the University of Agricultural and Veterinary Sciences (USAMV) in Cluj-Napoca. The study was carried out from 01/01/2022 to 30/06/2024, and the data were retrieved from the medical clinic department using ATLASVET software. Using the database provided by the software, we were able to select 2321 dogs and 757 cats.
Results: Within the population studied, 845 dogs and 119 cats presented at least one cardiac pathology, which represents 64% of the dogs studied but only 38% of the cats. In dogs, the most common disease recorded during these 30 months was the mycomathous mitral valve disease, which accounted for 68% of heart disease in dogs in this population, with 573 dogs affected. In cats, the hypertrophic cardiomyopathy was the most common disease, accounting for 65% of heart diseases in this population, with 78 cats affected. In dogs, the observed rate of mitral endocardiosis (68% of cardiac pathologies) is slightly lower in this study than that reported in North America by the ACVIM and in a study conducted in Iasi. In both cases, rates of mitral endocardiosis of up to 75% were reported. However, despite this slight difference, mitral endocardiosis remains over-represented in canine heart disease.
Conclusion: The retrospective analysis (2022 - 2024) of heart disease carried out at the University of Agronomic and Veterinary Sciences (USAMV) in Cluj-Napoca, which included 1331 dogs and 312 cats of different breeds, sexes and ages, revealed the following aspects:

1. The dogs in the study population most affected by mitral endocardiosis were senior and geriatric males, with an average age of 10.9 years; this condition seems to affect small breeds, the two breeds most affected being Bichons and Yorkshire Terriers.
2. In cats, the majority of cases of hypertrophic cardiomyopathy recorded are in adult males (mean age: 6.9 years); this pathology is observed mainly in the British shorthair breed (32%).

Keywords: epidemiology, prevalence, heart disease, dog, cat

EVALUATING MAGNESIUM-BASED ALLOYS FOR BIOMEDICAL APPLICATIONS: IN VITRO BIOCOMPATIBILITY AND ESTABLISHING AN ANIMAL MODEL FOR IN VIVO TESTING

Maria-Cristina MORARU[1*], Marius C. MANOLE[2], Gheorghe-A. MARTAU[3], Olga SORITAU[4], Dan VODNAR[3], Bogdan SEVASTRE[1]

[1]Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania
[2]Faculty of Dental Medicine, University of Medicine and Pharmacy, Cluj-Napoca, Romania
[3]Faculty of Food Science and Technology, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania
[4]Department of Genetics, Genomics and Experimental Pathology, The Oncology Institute "Prof. Dr. Ion Chiricuță" Cluj-Napoca, Romania
[*]Corresponding author, e-mail: maria.moraru@usamvcluj.ro

Introduction: Developing biodegradable materials for orthopedic implants is a critical advancement in biomedical engineering. Magnesium (Mg)-based alloys are particularly promising due to their unique combination of biodegradability, biocompatibility, and mechanical properties that closely mimic those of human bone. Unlike traditional non-degradable metal implants, Mg-based alloys temporarily support healing tissues and degrade naturally within the body, reducing the need for secondary surgical removal and minimizing long-term complications. **Aims**: evaluation of the biomedical potential of various Mg alloys by focusing on them in vitro biocompatibility, minimum inhibitory concentration (MIC), and preliminary *in vivo* performance.
Materials and Methods: In vitro, biocompatibility was assessed using osteoblast cell cultures treated with different Mg alloys (ZMX 100, ZMX 410, MRI 201S, MRI 202S) and evaluated via MTT assay to measure cell viability. Antimicrobial testing involves determining the minimum inhibitory concentration (MIC) against various bacterial and fungal strains. In vivo, performance was tested using Sprague Dawley rats with induced bone and subcutaneous defects, subsequently filled with powdered Mg alloys.
Results: The Mg alloys exhibited 100% cell viability, indicating excellent biocompatibility and non-toxicity in osteoblast cultures. MIC tests revealed the ZMX 100 alloy had a lower MIC against *Aspergillus brasiliensis* than the control, indicating superior antifungal activity. Additionally, all tested Mg alloys exhibited the lowest MIC values for *Pseudomonas aeruginosa*, a pathogen known for its clinical resistance, highlighting the potential of Mg alloys in reducing surgical site infections. These findings suggest that Mg alloys could significantly prevent post-surgical infections and improve implant safety. In vivo, animal studies showed that Mg alloys were well-tolerated with no significant adverse effects, apart from minor subcutaneous emphysema due to hydrogen gas formation as the alloys degraded. This indicates the potential of Mg alloys in developing biodegradable implants that degrade naturally without harming the host.
Conclusion: This research demonstrates that Mg-based alloys possess excellent biocompatibility and antibacterial properties, making them strong candidates for next-generation orthopedic implants. Future studies will focus on detailed histopathological examinations and micro-CT analyses to further validate these findings and optimize the clinical use of Mg alloys.

Keywords: Biocompatibility, Magnesium alloys, Orthopedic implants, Minimum Inhibitory Concentration, Biodegradability.

EPIDEMIOLOGY OF LEFT-TO-RIGHT PERSISTENT DUCTUS ARTERIOSUS IN DOGS OVER THE PAST 3 YEARS

Raluca MURARIU[1, *], Alexandra COFARU[1] and Iuliu Călin SCURTU[1]

[1] *Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania*
[*]Corresponding author, e-mail: raluca.murariu@usamvcluj.ro

Introduction: *Persistent ductus arteriosus* (PDA) is one of the most common congenital heart defects in dogs, characterized by the failure of the arterial duct to close after birth. The abnormal blood flow generates various grades of hemodynamic consequences and heart remodelling.
Aims: This study aims to characterise the epidemiological trends, breed predisposition, and clinical outcomes of PDA in dogs diagnosed at the Cardiology Clinic of FMV Cluj-Napoca over the past three years.
Materials and Methods: A retrospective analysis of veterinary records was conducted, and data were collected regarding breed, age at diagnosis, subjective and objective echocardiographic aspects of the heart, clinical condition, treatment approaches, and outcome of 25 patients diagnosed with left-to-right PDA.
Results: The analysis revealed a higher incidence of PDA in small to medium mixed-breed dogs (28%), followed by German Shepards (20%), and confirmed the already-known higher predisposition in females (20 out of 25 cases). The median age at diagnosis was 3 years, and echocardiographic changes revealed severe heart remodelling in almost half of the cases (48%), followed by moderate dilation in 7 out of 25 dogs and only one patient with no heart remodelling. Treatment approach primary included closure of the ductus, which was performed by surgical ligation in 4 cases and by minimally invasive catheter-based occlusion in other 4 dogs. A negative outcome after curative treatment was detected in patients with already severely affected heart hemodynamics.
Conclusion: This study highlights the similarities and differences of a cohort of PDA cases diagnosed at FMV Cluj-Napoca compared to the literature and underscores the importance of early detection of the disease and curative ductus closure in affected dogs.

Keywords: echocardiography, epidemiology, *patent ductus arteriosus,* outcome

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EVALUATION OF BLOOD LACTATE IN VARIOUS SURGICAL CONDITIONS IN DOGS AND CATS

Alexandra Maria MUREȘAN[1]*, Cosmin MUREȘAN[1] and Florin BETEG[1]

[1]*Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine Cluj Napoca, Romania*
*Corresponding author, e-mail: alexandra-maria.muresan@usamvcluj.ro

Introduction: Blood lactate concentration and clearance reflect cellular anaerobic metabolism and indicate tissue hypo-perfusion (Pang et al., 2007). Lactate measurement is useful in diagnosis, monitoring, and prognosis for many clinical conditions (Rosenstein et al., 2018). However, few studies have assessed this parameter in various surgical conditions in dogs and cats.
Aims: This study aimed to evaluate blood lactate variation in different surgical conditions and monitor blood lactate dynamics over 24 hours in dogs and cats with traumatic surgical conditions.
Materials and Methods: A prospective cohort study was conducted on 12 patients meeting inclusion criteria. Blood samples were collected from the cephalic or saphenous vein. Arkray Lactate Pro™ 2 analyzer measured lactate levels at admission (T0) and after 24 hours (T24).
Results: In dogs (n=7), at T0, two patients had normal lactate values, and five had abnormal values. At T24, three had normal values, and four had abnormal values. Normal lactate values for these species are 2 mmol/L. In cats (n=5), all had abnormal values at T0; at T24, four had normal values, and one had an abnormal value.
Conclusion: Lactate assessment is a minimally invasive, convenient procedure for monitoring dogs and cats with acute trauma undergoing surgery. Results must be interpreted alongside other clinical parameters.

Keywords: cat; dog; lactate evaluation; mortality; prognosis.

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EPIDEMIOLOGICAL AND CLINICAL ASPECTS IN CANINE SEBACEOUS ADENITIS

Alexandru-Constantin PINTILIE[1] and Viorica MIRCEAN[1]

[1]*Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine Cluj Napoca, Romania*
[*]Corresponding author, e-mail: pintiliucaalexandru@gmail.com

Introduction: Canine sebaceous adenitis (CSA) is a dermatological condition with a low incidence in practice, characterized by a granulomatous inflammation of the sebaceous glands. Csa is commonly reported in young to middle-aged adult Poodles, Vizslas, Akitas and Samoyeds (Hnilica & Patterson, 2016).
Aims: The objective of this study was to thoroughly characterize the epidemiology and clinical manifestations of canine patients diagnosed with sebaceous adenitis.
Materials and Methods: A retrospective study was conducted on the medical records of all 2447 individual dogs examined by the dermatology service of the FMV Cluj-Napoca over a 15-year period (2009-2024). All diagnoses had been confirmed by standard clinical and histopathologic criteria.
Results: CSA was diagnosed with a total prevalence of 0.32% (8/2447). The condition was recorded in 4 breeds of dogs: Akita Inu (5/8; 62.5%), Samoyed (1/8; 12.5%), Bichon Havanese (1/8; 12.5%), and Border Collie (1/8; 12.5%). The primary specific lesions, characterized by alopecia, follicular casts, and scales, were identified in specific topographic regions, with minor variations observed.
Conclusion: In the present research work, we demonstrated that this is a low incidence disease that focus some breeds as Akita, Samoyeds. Affected breeds in our study were predisposed to this diseases such as: Akita Innu, Samoyed, Havanese and Border collie. The primary lesions identified in CSA were: alopecia, scales, and follicular casts, with variations in lesion severity across different body regions.

Keywords: Canine sebaceous adenitis, epidemiology, clinical

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INDICATIONS, TECHNIQUE AND RECOVERY IN PANCARPAL ARTHRODESIS IN DOGS

Bianca POP[1*] and Ciprian OBER[1]

[1]*Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine Cluj Napoca, Romania*
Corresponding author, e-mail: bianca.pop@student.usamvcluj.ro

Introduction: The carpal bones connect the forearm to the metacarpal bones, through an articular complex that anatomically represents the basipodium. In general, in dogs, the pathology of the carpal region is not as common as that of the humero-radio-ulnar or scapulo-humeral region, but there are many conditions that can occur at this level. The joints of the carpal bones are prone to instability due to poor musculature or especially if there is hyperextension or hyperflexion, secondary to damage to the palmar or collateral ligaments. They play a major role in joint support and stability. Inflammatory or degenerative processes may also occur, with or without septic consequences. Dislocations are also encountered.
Aims: The purpose of the paper was to describe the cases of the 10 dogs, together with the surgical technique performed, the postoperative period, the complications that occurred, the results both in the short term and in the long term and the satisfaction of the owners regarding the dogs treated by means of pancarpal arthrodesis.
Matherials and methods: The dynamic compression plate (DCP) 2.7/3.5 mm of pancarpal arthrodesis (hybrid DCP) was used with rigid bone grafting. This procedure actually involved immobilizing the joint in order to correct the defect present in each patient and restore the functionality of the limb. The surgical technique followed the same protocol in all patients.
Results: According to the owners, 8 dogs had excellent return of limb function and 2 dogs had a good return. Average time required for the disappearance of lameness was 5 months. Post-op X-ray examination confirmed very good healing for our pancarpal arthrodesis patients. Complications occurred in 2 dogs and included screw loosening and rejection of the implant.
Conclusion: This type of surgical protocol is a life-saving solution when conservative methods are not effective. Our study results suggest that pancarpal arthrodesis, using HDCP (Hybrid DCP), can be safely associated with the use of bivalve cast.

Keywords: arthrodesis, pancarpal, dog, hyperextension, joint

CORRELATIONS BETWEEN THE ADVANCED STAGES OF CHRONIC KIDNEY DISEASE AND NON-REGENERATIVE ANEMIA IN FELINES

Ioana-Nicole REU[1*] and Iuliana CODREANU[1]

[1]*University of Agronomic Sciences and Veterinary Medicine Bucharest, Faculty of Veterinary Medicine, 050097, Independentei Street, District 5, Bucharest, Romania*
[*]Corresponding author, e-mail: ioana-nicole.reu@fmvb.usamv.ro

Introduction: Anemia in felines with chronic kidney disease (CKD) has been associated with a decreased quality of life and a faster rate of pathology progression, having a complicated and more complex pathogenesis. The main cause of the non-regenerative anemia in these patients is the kidneys' inability to produce erythropoietin (EPO), a side effect being the destruction of the red blood cells and the decreased rate of the new red blood cells production. (Lulich, 1992). Another causal factor is represented by the suppressive impact of uremic toxins on the hematogenous marrow (Lynch, 2016).
Aims: This study aimes to highlight the correlation between the signs of IIIrd and IVth stage chronic kidney disease (characterized by: metabolic acidosis, azotemia, proteinuria, dehydration, malnutrition, hyperphosphatemia, hypertension) and normocytic, normochromic, non-regenerative anemia occurrence.
Materials and Methods: In this study, ten feline patients of various breeds (European, Persian, and British Shorthair) aged between 7 and 14 years old were included. 40% of the patients from the study were diagnosed with IIIrd stage of CKD, while 60% with IVth stage. The blood samples were analysed using ProCyte Dx Haematology Analyser – for hematology and Catalyst One Veterinary Blood Chemistry Analyser – for blood biochemistry.
Results: All four felines (n=4) with IIIrd stage of CKD have been diagnosed with mild non-regenerative anemia, while the other six patients (n=6) with IVth stage presented severe non-regenerative anemia.
Conclusion: In the present study, we demonstrated that the stage of chronic kidney disease has a very important influence regarding the occurrence of non-regenerative anemia, as degenerated cells of kidney release less erythropoietin.

Keywords: chronic kidney disease, felines, non-regenerative anemia.

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ANNUAL REGIONAL PREVALENCE FOR TRICHINELLA SPP. IN BOAR MEAT IN SIBIU COUNTY

Șerban-Emilian ȚICHINDELEAN[1] and Marian MIHAIU[2]

[1]*Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine Cluj Napoca, Romania*
Corresponding author, e-mail: serban-emilian.tichindelean@student.usamvcluj.ro

Introduction: Parasites of the genus *Trichinella* are transmitted among hosts by the ingestion of infected muscles, the typical predator-prey cycle *(*Pozio, E., Zarlenga, D. S., 2013), autoheteroxenous cycle (Șuteu, I., Cozma, V., 2004). In Romania, pork meat is consumed more frequently than wild boar meat, an aspect that does not neglect the importance of the veterinary sanitary control carried out on wild boar meat.
Aims: Highlighting the risks belonging to the sylvatic fauna, evaluating the impact of the transmission of zoonotic agents to domestic animals and humans respectively. Studies on the prevalence of trichinosis in wildlife at the county level; Investigations in the direction of Trichinosis in wild boar in a regional space.
Materials and Methods: a number of 53 samples were analyzed/subjected to the study by the method of artificial digestion at a laboratory with an accredited method. The isolated larvae were tested by the P.C.R. technique. National statistical data from the reference laboratory regarding the diagnosis of Trichinella Spp..
Results: Of the 53 samples obtained in 2023 and subsequently examined at a laboratory with an accredited method, only one was positive, thus it is necessary to identify the species at the IDSA. through the PCR technique. Trichinella britovi was confirmed.
Conclusion: Although the prevalence was 1.88% in 2023, increased, compered to 2021, the presence of the parasite in the examined meat samples being a low one, the risk of contamination is not eliminated. At the national level, in 2021, out of a total of 3856 samples examined, 27 were positive, resulting in a prevalence of 0.7%, and in 2020, out of a total of 6945 samples examined, 72 were positive, resulting in a prevalence of 1.03%, higher than that of 2021.

Keywords: Digestion, larvae, meat, *Trichinella*.

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SESSION 10: GEODESY, FORESTRY AND APPLIED EXACT SCIENCES

EARLY DETECTION OF BARK BEETLE INFESTATIONS OF SPRUCE STANDS, USING MULTISPECTRAL UAV IMAGERY. CASE STUDY FROM VALEA IERII, CLUJ COUNTY

Vasile ȘIMONCA[1], Emanuel Elemer ȘUBA[1*], Mircea Ioan VARGA[1], Alexandru COLIȘAR[1], Steluța Maria SÎNGEORZAN[1], Florin Alexandru REBREAN[1], Tudor SĂLĂGEAN[1], Horia Dan VLASIN[1]

[1] *Faculty of Forestry and Cadastre, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania*

[*]Corresponding author, e-mail: elemer-emanuel.suba@usamvcluj.ro

Introduction: Considering the evolution of technology and current concerns in forestry, the use of new UAV technologies is required to help implement forest ecosystem management systems (Kautz et. al., 2024). These non-invasive remote sensing techniques can significantly contribute to increasing the efficiency of pest control actions (Huo et. al., 2021).

Aims: The present work aims to highlight the advantages and disadvantages of using multispectral imaging techniques taken with UAS platforms, in solving the complex problem of spruce stands caused by bark beetle attacks.

Materials and Methods: The study was carried out in a 75-year-old spruce stand, located in the area of the Muntele Mare massif in the Western Carpathians, where seven experimental areas of 30 trees were placed. Trees were inventoried from the ground and from the air with a Mavic 3 Multispectral UAS platform. The study lasted approximately 6 months (between 12.04.2024-10.09.2024). The monitoring of the attack was carried out by ten flights and taking multispectral photograms, simultaneously with the inventory from the ground, according to some well-established criteria.

Results: A number of 10 multispectral orthophotoplanes were obtained as follows: Green (G): 560 ± 16 nm; Red (R): 650 ± 16 nm; Red Edge (RE): 730 ± 16 nm; Near infrared (NIR): 860 ± 26 nm. Also, an orthophotoplane was obtained in the visible spectrum, RGB. All these data, together with the details taken from the ground, such as the coordinates of the trees, the perimeters of the tree crowns and the infestation stage, allowed the precise detection of the effects of bark beetle attacks on the stand.

Conclusion: The possibility of detecting bark attacks is related to the modification of some physiological parameters such as leaf water content and chlorophyll degradation, thus the vegetation indices calculated in the near-infrared range, using images captured by the drone, show the most significant links between pixel values and the intensity of discoloration the trees.

Keywords: UAS, Multispectral, Bark beetle infestation, remote sensing

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Calea Mănăștur 3-5, 400372 Cluj-Napoca, Romania
Phone: +40 374.492.010, fax: +40 264.593.792